Quit rates and predictors of smoking abstinence in Thai Buddhist monks with noncommunicable diseases

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Abstract

Purpose – The purpose of this study is to calculate the smoking quit rate and to examine the factors influencing smoking abstinence among Thai Buddhist monks with noncommunicable diseases (NCDs).

Design/methodology/approach – This was a cross-sectional study of 136 Buddhist monks with NCDs purposively sampled from the Priest Hospital. The participants were between 20 and 59 years of age, smoked at least one cigarette a day and received cessation advice from nurses or other health professionals. The dependent variable was self-reported 7-day point-prevalence smoking abstinence assessment at a three-month follow-up. Independent variables were age, schooling level, nicotine dependence, intention to quit, physical activity and perceived self-efficacy in quitting cessation. Logistic regression was performed to evaluate the factors influencing smoking cessation.

Findings – 50 of the 136 Thai Buddhist monks (36.8%) reported the 7-day point prevalence abstinence at a three-month follow-up. About two-thirds of the participants indicated health concern as the motivation to quit smoking. Perceived self-efficacy of abstinence (odds ratio 1.04; 95% confidence interval 1.014–1.074) and intention to quit smoking (odds ratio 1.34; 95% confidence interval 1.129–1.599) were significant predictors of abstinence.

Originality/value – This is the first study of its kind to investigate the predictors of smoking cessation in Thai Buddhist monks with NCDs. The findings will be of help to healthcare counselors seeking to motivate monks to quit smoking.

Keywords Tobacco, Cessation, Buddhist monks, Self-efficacy, Intention to quit, Thailand

Paper type Research paper

Introduction

Worldwide public health systems continue to fight against noncommunicable diseases (NCDs), which have been responsible for huge economic losses to countries and increasingly high medical treatment expenses, as well as high rates of morbidity and mortality. In 2015, 6·4m of global deaths were attributable to smoking, and the three leading causes of age standardised disability-adjusted life years (DALYs) attributable to smoking were cardiovascular diseases (41.2%), cancers (27.6%) and chronic respiratory diseases (20.5%) [1]. Data from Thailand have revealed an increased incidence of noncommunicable diseases, not only in the general population but also in Buddhist monks. According to the 2019 Priest Hospital's annual report, the five most common outpatient conditions among Thai monks

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were dyslipidemia, arterial hypertension, diabetes mellitus, chronic renal failure and senile cataract [2]. Likewise, a cross-sectional survey by Sirivong *et al.* [3] conducted in Bangkok on 214 monks indicated that most monks reported at least one known medical illness, among which the three most common were hypertension, diabetes mellitus and dyslipidemia. In addition, about half of the participants (50.9%) had been smokers with a median of five pack-years (range, 0.05–64.0 pack-years) lifetime tobacco exposure [3].

Among the most important modifiable risk factors for NCDs is cigarette smoking, which is a critical issue among Thai Buddhist monks. The smoking rate among Thai Buddhist monks as reported in previous studies varied from 24.4% in 2011 [4] to 66.6% in 2020 [5].

There have been some efforts toward smoke-free temples and encouraging villagers stop providing cigarettes to the monks [6]. Despite the fact that Thailand's Ministry of Public Health is well aware of the importance of smoking cessation and has launched a number of successful campaigns to stop smoking through various channels, encouraging monks to abstain from smoking has not been widely implemented. In Thailand, monks are a group of people who are important to the Buddhist Institution in terms of religious observance and psychological support of the Thai people [6]. Providing assistance in quitting smoking is an effective strategy for controlling tobacco use [7] and a critical component in caring for persons with chronic disease [8]. Literature suggests that patients who continue smoking have a greater chance of disease complications and death [8]. As part of the priesthood, it is harder for monks to quit smoking as they are usually offered cigarettes from Thai Buddhists who make merit at temple [9]. Meanwhile, the monks obviously lack of health information of how to quit smoking. These factors have hindered them in their efforts to quit smoking. To provide effective support for Buddhist monks to quit smoking, it is necessary to identify factors that influence smoking cessation as this would help implement the strategies that are most likely to help them quit permanently.

There have been a large number of studies to address factors associated with smoking cessation. The common factors predicting successful smoking cessation included previous quit attempts [10], intention to quit [11], perception of abstinence self-efficacy [11–13] and lack of depression and anxiety [10]. Empirical evidence also suggests that engaging in physical activity helps in achieving smoking cessation [14]. Those investigations were carried out on various populations including college students [12], adult smokers [13] and hospitalized smokers [11]. A review of literature has suggested that research, conducted locally and internationally, regarding factors associated with smoking cessation among Buddhist monks is still limited. Thus, the chief aim of this study was to explore the quit smoking rate among Buddhist monks with NCDs and to identify which factors were responsible for the success. It is expected that the current study will contribute to the adoption of the most effective interventions for Buddhist monks with NCDs to give up smoking and prevent disease complications.

Methods

This cross-sectional descriptive survey was done in the outpatient clinic in the Priest Hospital from April to August 2019. A total of 136 Thai Buddhist Monks were purposively recruited for this study. The sample size was calculated using the G* power program based on an α-value of 0.05 and a power of 0.80, the expected effect size from the previous study [15]. Inclusion criteria included Thai Buddhist monks who smoked one or more cigarettes per day, aged 20–59, having at least one NCDs related to smoking such as diabetes mellitus, arterial hypertension and received counselling to quit smoking from health professionals.

Ethical considerations

For the protection of participants' human rights, the study was granted approval by the Ethics Committee at the Priest Hospital (IRB No 6/2562, issued on April 29, 2019).

Instruments

The demographic data form used in the study was constructed by the study coordinators from examples in the literature [16]. The survey asked for medical history and personal information including about tobacco use per day, number of quit attempts, etc. The Fagerstrom test for nicotine dependency (FTND), a six-item questionnaire, was used to measure physical nicotine dependence. The FTND is used in many countries and has good psychometric validity. A previous study reported the intraclass correlation coefficient (ICC) of the Thai version of the FTND as 0.83, and Cronbach's alpha was 0.52 [17]. The autonomy over tobacco scale (AUTOS), a 12-item self-administered survey [18], was used to measure the degree to which the monks had lost control over their use of tobacco. The participants were asked to rate using four options, from 0 (not at all) to 3 (very well). The instrument was translated into Thai, with permission from the authors.

Self-efficacy for smoking cessation was evaluated using a 16-item self-reported questionnaire [19]. The items described various situations for which participants could indicate on a 5-point rating scale (0–4) whether they have confidence to quit smoking. The higher the score, the greater the perception of self-efficacy regarding smoking cessation. A Thai version of the 20-item Center for Epidemiologic Studies depression scale (CESD) was used to assess depression [20]. The alpha reliability coefficient of the CESD, for this study, was 0.85. The Thai version of the International Physical Activity Questionnaire-Short Form (IPAQ-SF) was used to measure physical activity (with permission). The seven-item IPAQ-SF measures moderate-to-vigorous activity, walking and sitting within a seven-day period. The total score is converted into an estimate of metabolic equivalents (METs)-minutes/week. The IPAQ-SF has been utilized in previous research on tobacco cessation [14]. The Thai version of the IPAQ-SF has acceptable reliability with an intraclass correlation coefficient (ICC) of 0.69 [21].

Telephone interviews were conducted by the researchers at the three-month follow-up assessment. The quit smoking questionnaire was created by study experts from examples in the literature to assess the participants' smoking status [16]. The participants were asked "During the past seven days, did you continuously abstain from smoking?", and "Have you continuously abstained from smoking for three months after you received cessation advice?" For the latter question, the participants could indicate whether they smoked (1), did not smoke, (2) smoked 1–2 cigarettes, (3) smoked about 5 cigarettes or (4) smoked > 5 cigarettes. All questionnaires were validated before use for clarity, appropriate language and content by five experts.

Data collection

Data were collected at the outpatient department by the researchers. When the inclusion criteria were fulfilled and the monks agreed to participate, the researchers had them sign the consent forms and explained how to answer the questions on the questionnaires. All questionnaires were self-administered. At week 12, the follow-up phone interviews were carried out to determine the major outcome, which was seven-day point-prevalence abstention from smoking (Figure 1).

Statistical analysis

The statistical tests were executed with IBM SPSS version 22 with $p < 0.05$ considered significant. Data were expressed as mean ± standard deviations (SD) and analyzed by descriptive statistics and logistic regression. We used Pearson's chi-squared test for identifying the predictors of smoking abstinence in univariate analyses. Point bi-serial correlations were also conducted between continuous and dichotomized variables. Multiple logistic regression analyses were run to determine the major drivers for smoking abstinence

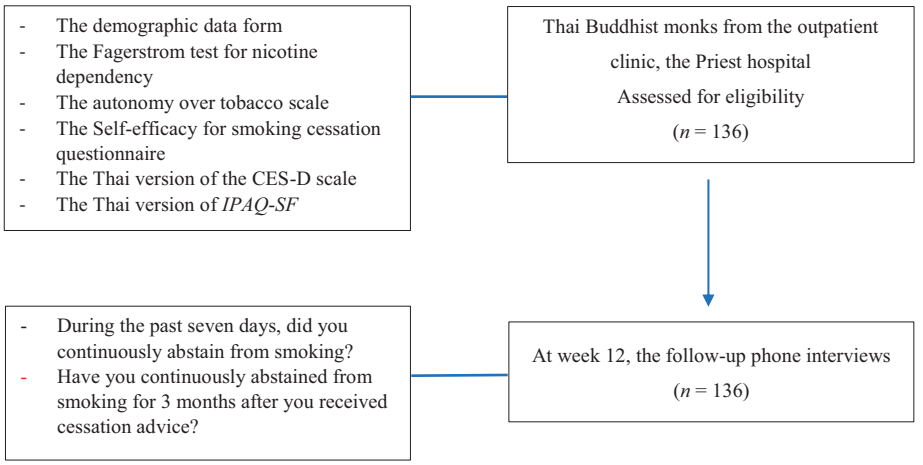

Figure 1.
Flow chart in the study

and to calculate odds ratio and 95% confidence intervals. The independent variables were Dharma education, nicotine dependence, smoking cessation self-efficacy, intention to quit smoking, depression, physical activity and previous quit attempts. In this study, likewise, the correlation coefficient "*r*" was considered "high" when it was >0.70, "good" when it was between 0.50–0.70, "fair" if it was between 0.30–0.50 and "weak or no association" if it was <0.30 [22]. Any variable that was significant by bivariate analysis was included in the multiple logistic regression model.

Results

Demographic characteristics

Table 1 presents the participants' demographic and smoking-related characteristics. The Buddhist monks' average age was 51.2 ± 8.8 yrs. 61 percent of the participants smoked fewer than 10 cigarettes per day, with a mean of 14.7 ± 12.3 cigarettes. The majority had tried to quit smoking at least once.

Smoking abstinence rate

Table 2, of the 136 participants, 36.8% reported achieving a 7-day point-prevalence abstinence at 90 days after beginning the trial. The self-reported continuous abstinence rate at 90 days was 30.0%.

Table 3 presents the correlations between selected variables and 7-day point-prevalence smoking abstinence at the three-month follow-up. Intention to stop smoking, perceptions of abstinence self-efficacy and physical activity and number of previous quit attempts were significantly related to three-month abstinence. A weak association ($r < 0.3$) of previous quit attempts and abstinence was observed in this study. Then previous quit attempts and unrelated variables were omitted from the multiple analyses.

Table 4 shows data from multivariate logistic regression. Two statistical predictors were identified. The odds of smoking abstinence for intention to quit smoking were 1.34, and for belief in self-efficacy of abstinence, the odds were 1.04.

Discussion

To the best of the authors' knowledge, this study is the first published report on the factors influencing smoking cessation among Thai Buddhist monks. About 36.8% of the

	N	%
Age, *mean (standard deviation)*	51.2 years (standard deviation = 8.8)	
Duration of ordination, *mean (standard deviation)*	14.3 years (standard deviation= 11.3)	
Dharma schooling level		
No	26	19.12
Elementary level	35	25.74
Intermediate level	16	11.76
Advanced level	59	43.38
Health conditions		
Arterial hypertension	80	38.50
Diabetes mellitus	61	29.30
Chronic obstructive pulmonary disease	14	6.70
Cardiovascular diseases	10	4.80
Cerebrovascular diseases	6	2.90
Number of cigarettes smoked per day		
1–10	83	61.00
11–20	38	27.90
>20	15	11.00
Time to first cigarette in the morning		
Within 5 min	64	47.05
6–30 min	34	25.00
31–60 min	24	17.65
>60 min	14	10.30
Level of nicotine dependence (FTND)		
Mild-moderate (FTND score < 6)	54	48.20
High dependence (FTND score ≥ 6)	58	51.80
Tobacco dependence by the AUTOS, *Mean (Standard deviation)*	12.25 (7.72)	
Previous quit attempts		
0	27	19.90
1–2	65	47.80
>2	44	35.30

Note(s): FTND: Fagerström test for nicotine dependence; AUTOS: Autonomy over Tobacco Scale

Table 1. Participants' characteristics (n = 136)

	n	%
Seven-day point prevalence abstinence		
Yes	50	36.80
No	86	63.20
3-month continuous abstinence		
Yes	42	30.00
Smoked 1–2 times (not whole cigarette)	2	1.50
Smoked 1–5 cigarettes	6	4.40
>5 cigarettes	86	63.10

Table 2. Self-reported smoking abstinence at three-month follow-up (n = 136)

Table 3.
Correlation coefficients and relationship between predictors; it shows by correlation matrix

	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9
X_1	1.000								
X_2	0.096	1.000							
X_3	0.121	0.391*	1.000						
X_4	−0.048	−0.168	−0.364*	1.000					
X_5	−0.127	−0.070	−0.067	0.464*	1.000				
X_6	0.124	0.137	0.225*	−0.138	−0.185*	1.000			
X_7	−0.072	−0.127	−0.145	0.177*	0.170*	0.014	1.000		
X_8	0.038	−0.053	−0.101	0.324*	0.447**	0.062	−0.017	1.000	
X_9	−0.048	−0.064	−0.092	0.432*	0.458**	−0.065	0.315*	0.188*	1.000

Note(s): X_1 Dharma education; X_2 Nicotine dependence by the Fagerstrom test for nicotine dependence; X_3 tobacco dependence by the Autonomy over Tobacco Scale; X_4 smoking cessation self- efficacy; X_5 intention to quit smoking; X_6 depression; X_7 physical activity; X_8 previous quit attempts; X_9 7-day point-prevalence abstinence; *p-value ≤ 0.05

Table 4.
Multivariate logistic regression analyses on predictors of three-month smoking abstinence (n = 136)

	OR	95% CI	p value
Intention to quit smoking	1.34	1.137–1.585	0.001
Smoking cessation self-efficacy	1.04	1.014–1.074	0.003
Physical activity (METs)	1.00	1.001–1.002	0.002

Note(s): OR, odds ratio; CI, confidence interval

participants achieved self-reported 7-day point- prevalence abstinence at the three-month follow-up. Similarly, the three-month continuous quit rate in these smokers was 30.0%. This abstention rate is relatively close to that reported by the SMART Quit clinics in 2019 (40.5%) [16]. Tobacco cessation services at the Priest Hospital mainly include brief advice on quitting smoking by health professionals. The most common reason motivating the monks to abstain from smoking was personal health concerns. The majority of participants reported having diabetes mellitus. Evidence from a systematic review indicated that the diabetics who stop smoking tend to have a reduction in the risk of cardiovascular morbidity and mortality compared with those who continue to smoke [23]. Thus, health professionals, especially nurses, may present examples of the adverse health effects of smoking on monks with diabetes mellitus to motivate them to abstain from smoking. This study measured smoking cessation without using biochemical validation techniques, which is considered accurate. It is still unclear under which circumstances biochemical validation methods are necessary to support self-reported outcomes [24].

Our multivariate analysis showed that monks who intended to stop smoking and believed in their self-efficacy with regard to abstinence were significantly more likely to achieve success in quitting. The monks who exhibited a greater self-efficacy regarding the ability to stop smoking were significantly more likely to be abstinent after three months. This result agreed with other studies on the general population and hospitalized patients. In the International Tobacco Control Southeast Asia (ITC-SEA Thailand) survey, self-efficacy was a strong predictor of short-term smoking cessation [25], which is similar to the finding from the study among hospitalized smokers who plan to quit [11]. Similarly, a study among smokers not currently interested in quitting found that self-efficacy was a significant predictor of seven-day abstention [26]. It is a challenge for nurses to reinforce Buddhist monks' beliefs in their capacity for quitting smoking as they are the spiritual leaders of the Buddhists. Intention to quit smoking also increases the odds of success in giving up tobacco.

The results from this study support previous research, which found that a firm intention to succeed is a strong indicator of smoking cessation [11, 12, 27]. The study by Streck *et al.* [11] reported that a firm resolution to quit smoking after hospital discharge was correlated with smoking cessation in hospitalized cigarette smokers.

Evidence from a meta-analysis showed that physical activity helped smokers overcome the nicotine withdrawal symptoms of craving cigarettes and feelings of stress and depression [28]. However, we did not find a positive influence of physical activity on smoking cessation in Thai Buddhist monks, probably because they have a very different lifestyle from other people. According to the Buddhist discipline, monks spend a large amount of time daily in floor activities, such as praying and meditating, and this study showed that most participants engaged in low-to-moderate intensity physical activity. With regard to the influence of previous attempts at quitting, our results did not show a significant effect on smoking cessation. However, a systematic review by Vangeli *et al.* [10] reported mixed results of previous quit attempts as a predictor of smoking cessation.

Conclusions, limitations and recommendation

Our results indicated that the two most important contributors to smoking abstinence were a strong intention to quit and perceived self-efficacy toward abstinence. Thus, promoting intentions and feelings of self-efficacy to give up cigarettes should be at the forefront when delivering tobacco cessation counseling. Moreover, during every clinic visit, nurses and other healthcare workers should encourage Thai Buddhist monks with NCDs who currently smoke to make more disciplined efforts to quit and to engage in moderate physical activity. The present study is clearly limited because of its cross-sectional nature and because smoking cessation was assessed by self-reporting only and was not confirmed by biochemical testing. In spite of these drawbacks, we have provided useful insights on the most effective ways to address tobacco use in Buddhist monks with NCDs. Further research can be carried out in a large sample using the replicated variables including physical activity and other measures.

References

1. GBD 2015 Tobacco Collaborators. Smoking prevalence and attributable disease burden in 195 countries and territories, 1990–2015: a systematic analysis from the global burden of disease study 2015. Lancet. 2017; 389(10082): 1885-906. doi: 10.1016/S0140-6736(17)30819-X.
2. Ministry of Public Health, Department of Medical Services, Priest hospital. Annual report 2019. [cited 2020 July]. Available from: https://www.priest-hospital.go.th/report/reportYear.
3. Sirivong P, Tangjitgamol S, Sornda K, Kamsom A. General health status of Thai monks living in Bangkok metropolitan temples. J Med Assoc Thai. 2019; 102(9): 1-9.
4. Kungskulniti N, Charoenca N, Kengganpanich T, Kusolwisitkul W, Pichainarong N, Kerdmongkol P, *et al.* Smoking prevalence among monks in Thailand. Eval Health Prof. 2012; 35(3): 305-22. doi: 10.1177/0163278711426424.
5. Yangthisan N, Joosing R, Roopmodee Y, Phetphum C. Smoking the related to situation and factors affect in the smoking of monks in the central region. J Public Health Naresuan Univ. 2020; 2(1): 28-40.
6. Thai health 2018: Buddhism and health promotion. Nakorn Pathom: Institute for Population and Social Research, Mahidol University; 2018. [cited 2020 July]. Available from: https://www.hiso.or.th/hiso/picture/reportHealth/report/ThaiHealth2018e.pdf.
7. World Health Organization [WHO]. Guideline on demand reduction measures concerning tobacco dependence and cessation. [cited 2020 July]. Available from: https://www.who.int/fctc/Guidelines.pdf?ua=1.

8. Gritz ER, Vidrine DJ, Fingeret MC. Smoking cessation a critical component of medical management in chronic disease populations. Am J Prev Med. 2007; 33(6 Suppl): S414-22. doi: 10.1016/j.amepre.2007.09.013.
9. Vanphanom S, Phengsavanh A, Hansana V, Menorath S, Tomson T. Smoking prevalence, determinants, knowledge, attitudes and habits among Buddhist monks in Lao PDR. BMC Res. Notes. 2009; 2: 100. doi: 10.1186/1756-0500-2-100.
10. Vangeli E, Stapleton J, Smit ES, Borland R, West R. Predictors of attempts to stop smoking and their success in adult general population samples: a systematic review. Addiction. 2011; 106(12): 2110-21. doi: 10.1111/j.1360-0443.2011.03565.x.
11. Streck JM, Chang Y, Tindle HA, Regan S, Park ER, Levy DE, *et al.* Smoking cessation after hospital discharge: factors associated with abstinence. J Hosp Med. 2018; 13(11): 774-8. doi: 10.12788/jhm.2997.
12. Pardavila-Belio MI, Ruiz-Canela M, Canga-Armayor N. Predictors of smoking cessation among college students in a pragmatic randomized controlled Trial. Prev Sci. 2019; 20(5): 765-75. doi: 10.1007/s11121-019-01004-6.
13. Klemperer EM, Mermelstein R, Baker TB, Hughes JR, Fiore MC, Piper ME, *et al.* Predictors of smoking cessation attempts and success following motivation-phase interventions among people initially unwilling to quit smoking. Nicotine Tob Res. 2020; 22(9): 1446-52. doi: 10.1093/ntr/ntaa051.
14. Lee YY, Khoo S, Morris T, Hanlon C, Wee LH, Teo EW, *et al.* A mixed-method study of the efficacy of physical activity consultation as an adjunct to standard smoking cessation treatment among male smokers in Malaysia. Springerplus. 2016; 5(1): 2012. doi: 10.1186/s40064-016-3675-2.
15. Ramkhuan C, Khuwatsamrit K, Panpakdee O. Factors related to smoking cessation behavior among patients after coronary artery bypass graft. Thai J Cardiothorac Nurs. 2016; 27(2): 2-16.
16. Pitayarangsarit S, Preechawong S, Wongphan T, Rungruanghiranya S. Health-related quality of life among people receiving smoking cessation services. Pacific Rim Int J Nurs Res. 2019; 23(3): 285-96.
17. Klinsophon T, Janwantanakul P, Thaveeratitham P. Reliability of the Thai version of the Fagerstrom test for nicotine dependence (FTND). J Med Assoc Thai. 2017; 100(10): 1130-4.
18. DiFranza JR, Wellman RJ, Ursprung WW, Sabiston C. The autonomy over smoking scale. Psychol Addict Behav. 2009; 23(4): 656-65. doi: 10.1037/a0017439.
19. Makmai W, Preechawong S, Treenai S. Effect of promoting smoking cessation program for parents to reduce secondhand smoke exposure in pediatric patients with asthma. Nurs J. 2019; 46(2): 59-69.
20. Vorapongsathron T, Pandii W, Triamchaisri S. Validity of the center for epidemiologic studies depression scale (CES-D). J Clin Psychol. 1990; 21(2): 25-45. (in Thai).
21. Rattanawiwatpong P, Khunphasee A, Pongurgsorn C, Intarakamhang P. Validity and reliability of the Thai version of short format international physical activity questionnaire (IPAQ). J Thai Rehabil Med. 2006; 16(3): 147-60.
22. Hinkle DE, Wiersma W, Jurs SG. Applied statistics for the behavioral sciences. 5th ed. Boston, Mass: Houghton Mifflin; 2003.
23. Nagrebetsky A, Brettell R, Roberts N, Farmer A. Smoking cessation in adults with diabetes: a systematic review and meta-analysis of data from randomised controlled trials. BMJ Open. 2014; 4(3): e004107. doi: 10.1136/bmjopen-2013-004107.
24. Cheung KL, de Ruijter D, Hiligsmann M, Elfeddali I, Hoving C, Evers S, *et al.* Exploring consensus on how to measure smoking cessation. A Delphi study. BMC Publ. Health. 2017; 17(1): 890. doi: 10.1186/s12889-017-4902-7.
25. Jampaklay A, Borland R, Yong HH, Sirirassamee B, Fotuhi O, Fong GT. Predictors of successful quitting among Thai adult smokers: evidence from ITC-SEA (Thailand) survey. Int J Environ Res Public Health. 2015; 12(10): 12095-109. doi: 10.3390/ijerph121012095.

26. Jardin BF, Carpenter MJ. Predictors of quit attempts and abstinence among smokers not currently interested in quitting. Nicotine Tob Res. 2012; 14(10): 1197-204. doi: 10.1093/ntr/nts015.

27. Li L, Borland R, Yong HH, Fong GT, Bansal-Travers M, Quah AC, *et al.* Predictors of smoking cessation among adult smokers in Malaysia and Thailand: findings from the international tobacco control Southeast Asia survey. Nicotine Tob Res. 2010; 12(Suppl): S34-44. doi: 10.1093/ntr/ntq030.

28. Haasova M, Warren FC, Ussher M, van Rensburg KJ, Faulkner G, Cropley M, *et al.* The acute effects of physical activity on cigarette cravings: systematic review and meta-analysis with individual participant data. Addiction. 2013; 108(1): 26-37. doi: 10.1111/j.1360-0443.2012.04034.x.

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