

A Brief Smoking Cessation Service in a Dental Clinic with Proactive Quitline Referral for Patients Awaiting Periodontal Treatment

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Abstract

The objective of the present study was to evaluate the effect of a brief dental clinic-based smoking cessation service (the “2 As”: Ask and Advise) in combination with proactive quitline referral among patients on a periodontal treatment waiting list. A quasi-experimental study was conducted at Faculty of Dentistry, Mahidol University. Daily smokers on a periodontal treatment waiting list were recruited and self-selected to receive the “2 As” plus proactive service from Thailand National Quitline (test group, n = 41) or to receive only the “2 As” (control group, n = 54). Self-reported quit rate, quit attempt rate and smoking reduction rate at 3-month and 6-month follow-up visits were compared between groups. At 3-month follow-up, compared to the controls, test participants had significantly higher 7-day point prevalence quit rate (14.6 % versus 1.9 %, $p = 0.04$), and 1-month prolonged quit rate (14.6 % versus 1.9 %, $p = 0.04$). At 6-month follow-up, only the 3-month prolonged quit rate of the test group was significantly higher than the control (14.6 % versus 1.9 %, $p = 0.04$). Among the non-quitters, there was a significant difference in the quit attempt rate between the test and the control groups (29.4 % versus 2.0 %, $p < 0.001$). In addition, the smoking reduction rate of the test was higher than the control (55.9 % versus 33.3 %, $p = 0.04$). In conclusion, the “2 As” in a dental clinic with proactive quitline referral appears to be an effective alternative intervention to help smokers on a periodontal treatment waiting list quit smoking. Further study is needed to determine patient acceptance of this intervention and to determine whether subsequent cessation is facilitated among non-quitters who had received this intervention.

Key words: The “2 As”; Periodontal treatment; Proactive quitline referral; Smoking cessation

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Introduction

In Thailand, a recent analysis of seven databases of the National Statistic Office revealed that the prevalence of current smokers decreased from 32.0 % in 1991 to 21.22 % in 2007.¹ Despite a remarkable reduction in smoking prevalence the number of current smokers is nearly 11 million which remains high. This figure is significant because cigarette smoking is hazardous to health of the smokers themselves and to the public. From the oral perspective, the most significant effects of smoking on the oral cavity include oral cancers, precancerous lesions, poor wound healing and periodontal diseases.²

With regard to periodontal diseases, smokers are approximately three times more likely to develop periodontitis than non-smokers, have a diminished response to periodontal therapy and show less improvement following various periodontal treatment modalities.³ Recently, a systematic review and individual patient data meta-analysis⁴ showed two prospective studies demonstrating an additional beneficial effect of smoking cessation on non-surgical periodontal treatment outcome after treatment over a 12-month period. In these two studies, Preshaw et al⁵ showed that quitting smoking led to an additional probing depth reduction while Rosa et al⁶ showed clinical attachment gain. Therefore, it is plausible that dentists should combine smoking cessation intervention in periodontal management for smoking patients and encourage them to quit.

The guideline which is recommended for helping patients to quit smoking in the dental settings is known as the “5 As” model (Ask, Advise, Assess, Assist and Arrange follow-up).^{7,8} Evidence in public health dental clinics suggests that dentist-delivered intervention for smoking cessation according to this guideline is effective.⁹ Unfortunately, dentists in many countries including Thailand do not routinely take part in smoking cessation intervention.¹⁰⁻¹³ Dentists who concern about smoking cessation often take part in the first two steps (Ask and Advise).^{14,15} Therefore, the subsequent steps (Assess, Assist and Arrange follow-up) which require extra skills and time are overlooked. In addition, the constraint in the number of dentists is considered to be another

barrier for delivering smoking cessation intervention based on the “5 As” model. For instance, a large number of new patients in university dental clinics in Thailand may be on a waiting list for several months before receiving periodontal treatment. This results in a delay of smoking cessation intervention for patients who smoke. To overcome the aforementioned barriers, an alternative intervention model called the “2 As” and R model (Ask, Advise and Refer) is recommended.¹⁶ This model includes all steps from the original “5 As” model but the last three steps (Assess, Assist and Arrange follow-up) are distributed to other resources such as a quitline. Studies in USA showed that the use of the “2 As” and proactive quitline referral (provider-driven referral and quitline counsellor initiates call to the patients) was feasible either through physicians’ offices or dental offices.^{17,18} This telephone counselling has shown to be another effective intervention for smoking cessation.^{19,20}

In Thailand, the available tobacco use quitline service is provided by Thailand National Quitline (a free number: 1600). This quitline service is generally reactive in nature (smoker initiates all contact with quitline). Recently, the online approach to quitline was developed for engaging smokers from health care providers or smokers themselves in order to provide proactive service. Therefore, opportunities exist for implementing a brief smoking cessation intervention (the “2 As”) initiated in dental clinic with a referral to proactive quitline service. Nevertheless, this approach (the “2 As” and R intervention) has not been formally evaluated in Thailand.

The objective of the present study was to evaluate the effect of a brief dental clinic-based smoking cessation service (the “2 As”: Ask and Advise) in combination with proactive quitline referral among patients on a periodontal treatment waiting list.

Materials and Methods

This study was a quasi-experimental research which was approved by the Mahidol University Institutional Review Board (MU-IRB 2010/199.0107).

Participants

All new patients attending the Oral Diagnostic Clinic, Faculty of Dentistry, Mahidol University during

June 2010 to June 2011 answered a smoking status screening questionnaire. Current daily cigarette smokers were approached after they had their mouth examined and were included in the study if they were (1) 18 years or older, (2) on a waiting list for periodontal treatment, (3) voluntary to give consent, and (4) able to read and write in Thai language. The patients were excluded if they were in the process of (1) quitting smoking by themselves, or (2) treating tobacco dependence with medication, or (3) receiving a service from Thailand National Quitline.

All 108 daily smoking patients were eligible for the study but 13 patients refused to participate. Therefore 95 patients were allocated either to the test group if they were willing to receive an additional proactive service from Thailand National Quitline or to the control group if they refused to do so.

Interventions

All participants in both test and control groups received a brief smoking cessation service which was based on the first two A of the “5 As” model. It consisted of (1) Ask-systematically identify and record smoking status of all patients through the use of a questionnaire by the time the patients attended the clinic for an oral examination and (2) Advise-urge all smokers to quit by giving a strong and clear brief (5-8 minutes) structured smoking cessation advice concerning the etiology of periodontal disease, the effect of smoking on the severity of the disease and on the periodontal treatment outcome, and the benefit of quitting smoking to the upcoming periodontal treatment and the related general health. The latter step was provided by the same dentist throughout the present study.

In addition to a brief smoking cessation service provided in the dental clinic as described above, participants in test group had their information (including name, address, telephone number, and preferred time to receive their call back) transferred online by the dentist to Thailand National Quitline. Afterwards the participants would be called back for free, confidential counselling services according to the Thailand National Quitline protocol. The initial proactive counselling call usually occurred within 2 days of referral and aimed to provide

smokers with motivation to set a quit date. The content of the initial proactive counselling call included assessing smoking status, identifying and coping with triggers, setting tasks to assist with quitting, giving relapse prevention strategies and promoting self-efficacy. At the end of the call, test participants were asked if they were willing to set a quit date within 2 weeks and to receive six additional proactive counselling calls for follow-up and support. If the participants accepted, the additional calls were scheduled at 1, 2, 4 weeks, 3, 6 and 12 months after the quit date. The initial counselling call took approximately 45 minutes depending on each participant, while the follow-up calls lasted about 15 - 20 minutes each. According to the study protocol, test participants were expected to receive a total of 5 follow-up calls at the end of the study.

Data collections

The baseline data of the participants was collected from the patient's chart records at the time of enrollment which included socio-demographic characteristics, smoking characteristics, nicotine dependence level, readiness to quit smoking and smoking-related oral diseases.

Nicotine dependence level was measured with the Fagerström Test for Nicotine Dependence (FTND).²¹ The FTND consists of 6 questions and scoring. The scores from each question were summed and used to interpret level of dependence on nicotine: 0 - 2 very low dependence, 3 - 4 low dependence, 5 medium dependence, 6 - 7 high dependence, and 8 - 10 very high dependence.

Readiness to quit smoking of the participants was measured with the Readiness to Quit Ladder.²² It consists of a 10-point scale with scores ranging from 1 (no interest in quitting) to 10 (has quit smoking)

Two follow-up appointments were made at 3 and 6 months after a brief smoking cessation service for the participants in the control group and after an initial proactive counselling call for the participants in the test group. In these appointments, each participant was asked to complete a self reported follow-up smoking behavior questionnaire regarding current smoking status, number of cigarette consumption per day, quit attempt or abstinence and the length of abstinence within the last 3 or 6 months. In these 2 appointments periodontal treatment

were provided to all participants. For participants who could not come to see the dentist on the appointments that provided, the dentist arranged a follow-up telephone interview using the items in the self reported follow-up smoking behavior questionnaire instead.

Information concerning the number of proactive counselling calls (except the 12-month follow-up call) that the test participants completed were collected from the quitline records.

Study outcome measures

The primary outcome measures were the self-reported quit rate at 3-month and 6-month follow-up visits. In this study 2 types of quit rate were assessed: (1) point prevalence quit rate referred to the proportion of participants not smoking at all in the previous 7 days at the time of assessment and (2) prolonged quit rate referred to the proportion of participants not smoking continuously for a period of 1 month, 3 or 6 months at the time of assessment.²³

For those who were non-quitters at the 6-month follow-up, the secondary outcomes were assessed including the proportion of non-quitters reported to (1) deliberately refrain from smoking at least 24 hours at any point during the study period (quit attempt rate) and (2) reduce cigarette consumption from the baseline level at both 3-month and 6-month follow-up visits (smoking reduction rate).

Statistical analyses

The sample size of this study was calculated using the formula proposed by Lemeshow et al.²⁴ and the results from previous pilot study by Ebbert et al.¹⁸ A difference in point prevalence quit rates of 20 % between groups was expected. Using a two-sided alpha of 0.05 and 95 % confidence interval, the sample size required in each group was at least 37 subjects.

All data were analyzed using Statistical Package for Social Science for Windows version 11.5.0 (SPSS Inc, Chicago, IL, USA). Comparisons between groups were tested by Mann-Whitney U test, Chi-Square Test or Fisher's Exact Test as appropriate. A *p* value < 0.05 was considered statistically significant.

All outcomes were analyzed according to the intention to treat approach.²⁵ Therefore, participants

who lost to follow-up were presumed to be smokers, to make no quit attempt and to smoke the same amount of cigarettes as the baseline.

Result

Among 95 patients participated in the study, 41 patients were self-selected to receive the "2 As" plus proactive service from Thailand National Quitline (test group) and 54 patients received only the "2 As" (control group). The flowchart of recruitment and retention of participants through the study was shown in Figure 1.

The baseline characteristics of the participants in the test and the control groups are summarized in Table 1. Most of the participants in both groups were middle aged, employed or self-employed, single, male and had a bachelor's degree or above. These demographic characteristics of the test and the control groups were comparable (*p* > 0.05). There were no significant differences between groups in the numbers of cigarettes smoked per day, duration of smoking, smoking history (pack-years), previous quit attempt, FTND score and Readiness to Quit Ladder score. The participants in the test and the control groups who had no plan to quit were 36.6 % (15/41) and 29.6 % (16/54), respectively. About 40 % of the participants in each group had plans to quit in the next 30 days or was ready to set a quit date or reduce consumption.

No participants in either group reported a history of the smoking related systemic diseases. Apart from periodontal diseases, other oral diseases or conditions related to smoking were diagnosed including stomatitis nicotina (2.4 % of the test and 1.9 % of the control participants) and smoker's melanosis (75.6 % of the test and 66.7 % of the control participants). Tobacco stain was not mentioned in any dental chart record of the participants in both groups.

Primary outcomes

At the 6-month follow-up, seven participants in the test group reported that they had ceased smoking and the duration of abstinence ranged from 2.5 to 6 months while three participants in the control group reported that they had also ceased smoking and the duration of abstinence ranged from 2 to 5 months.

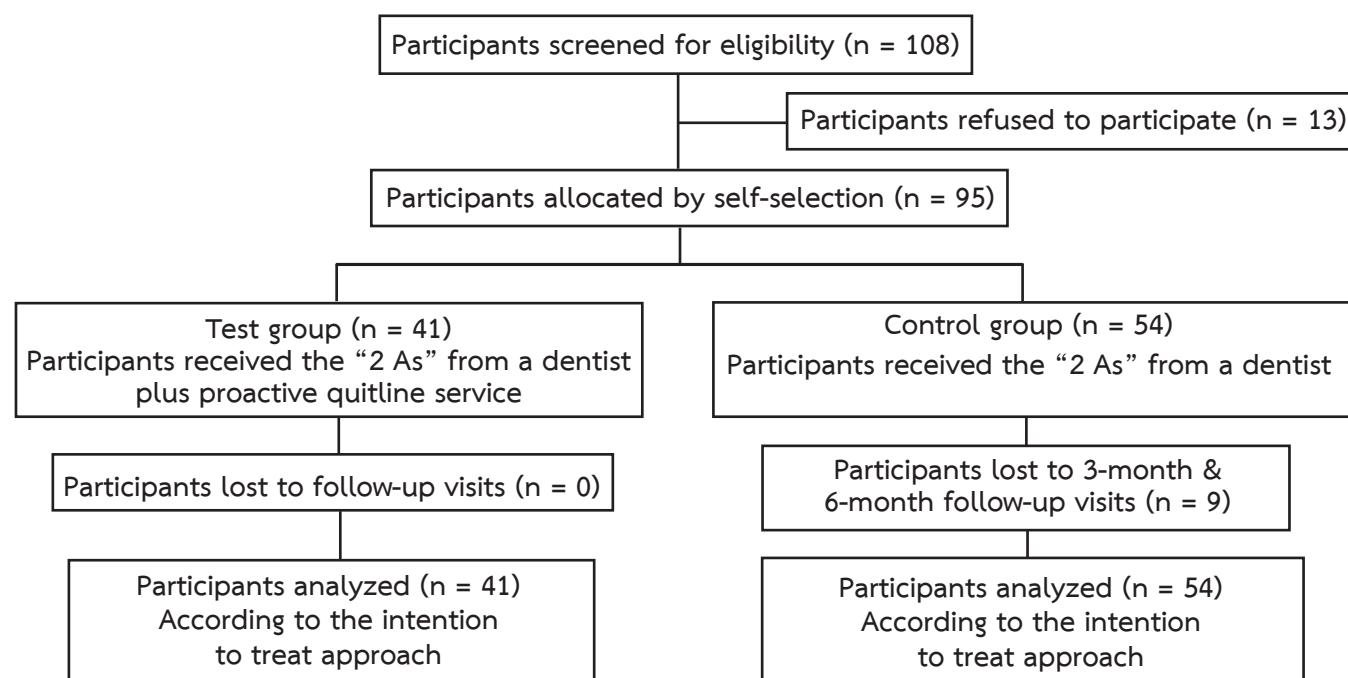


Figure 1 Flowchart of recruitment and retention of participants through the study

Table 2 shows the self-reported point prevalence and prolonged quit rate for each follow-up. The participants in the test group showed higher 7-day point prevalence quit rate and 1-month prolonged quit rate than the control group at 3-month follow-up (14.6 % versus 1.9 %; Fisher's Exact Test, $p = 0.04$). At 6-month follow-up, the significant difference was found only in the 3-month prolonged quit rate (14.6 % of the test group versus 1.9 % of the control group; Fisher's Exact Test, $p = 0.04$).

According to the quitline records, all participants in the test group received an initial proactive counselling call and were set quit dates. None of the participants received all five follow-up calls and 48.8 % (20/41) received only initial call without any follow-up call. Only one participant received the first follow-up call (1 week after the quit date). The most frequently received follow-up call was the 6-month follow-up call (72.2 %) followed by the 3-month (50 %), 4-week (40.9 %), and 2-week (27.3 %) follow-up call. Table 3 presents the distribution of participants in the test group who reported abstinence in the previous

7 days at 6-month follow-up according to the number of quitline sessions completed. It was found that the lowest quit rate was observed among participants who received only initial call while the highest was observed among participants who received initial call and 4 follow-up sessions (Table 2).

Secondary outcomes

In order to investigate the effect of the interventions on the participants who did not quit smoking at the 6-month follow-up, two secondary study outcomes (quit attempt rate and smoking reduction rate) were analyzed after excluding participants who reported that they had quit smoking at least in the previous 7 days.

Among the non-quitters, there was a significant difference in the quit attempt rate between the test and the control groups (29.4 % versus 2.0 %, $p < 0.001$). In addition, the smoking reduction rate of the tests was higher than the controls (55.9 % versus 33.3 %, $p = 0.039$).

Table 1 Baseline characteristics of the test and control groups

Characteristic	Test group (n = 41)	Control group (n = 54)
Age (years)*		
Mean ± SD (range)	34.40 ± 9.80 (18 - 63)	35.20 ± 11.00 (20 - 72)
Gender [†] n (%)		
Male	33 (80.50)	48 (88.90)
Female	8 (19.50)	6 (11.10)
Employment status [†] n (%)		
Employed or self-employed	26 (63.40)	37 (68.50)
Unemployed/housewife/student	15 (36.60)	17 (31.50)
Education level [†] n (%)		
Secondary school or below	8 (19.50)	15 (27.80)
Diploma/Certificate	8 (19.50)	9 (16.70)
Bachelor Degree or above	25 (61.00)	30 (55.50)
Marital status [†] n (%)		
Single	27 (65.90)	34 (63.00)
Married	14 (34.10)	20 (37.00)
Number of cigarettes per day*		
Mean ± SD (range)	12.20 ± 9.80 (2 - 50)	8.90 ± 6.20 (2 - 25)
Duration of smoking* (years)		
Mean ± SD (range)	11.90 ± 8.30 (1 - 40)	12.80 ± 9.10 (1 - 50)
Number of pack-years*		
Mean ± SD (range)	9.50 ± 13.20 (0.10 - 70.00)	6.60 ± 7.00 (0.20 - 30.00)
Previous quit attempt [†] n (%)		
No previous quit attempt	15 (36.60)	16 (29.60)
1 previous quit attempt	12 (29.30)	15 (27.80)
≥ 2 previous quit attempts	14 (34.10)	23 (42.60)
FTND score*		
Mean ± SD (range)	2.60 ± 2.30 (0 - 8)	2.10 ± 2.10 (0 - 7)
Readiness to Quit Ladder score*		
Mean ± SD (range)	6.20 ± 1.30 (4 - 8)	6.20 ± 1.30 (3 - 8)

Difference in baseline smoking characteristics between groups were tested with the *Mann-Whitney U Test or [†]Chi-Square Test and none of the characteristics was statistically significant ($p > 0.05$), FTND: Fagerström Test for Nicotine Dependence

Table 2 Self reported primary outcomes (quit rates) of test and control groups at follow-up visits

Outcome	No. (%) of participants		
	Test group (n = 41)	Control group (n = 54)	<i>p</i> *
<i>At 3-month follow-up visit</i>			
7-day point prevalence quit rate	6 (14.60)	1 (1.90)	0.040
1-month prolonged quit rate	6 (14.60)	1 (1.90)	0.040
3-month prolonged quit rate	2 (4.90)	0 (0.00)	0.184
<i>At 6-month follow-up visit</i>			
7-day point prevalence quit rate	7 (17.10)	3 (5.60)	0.095
1-month prolonged quit rate	7 (17.10)	3 (5.60)	0.095
3-month prolonged quit rate	6 (14.60)	1 (1.90)	0.040
6-month prolonged quit rate	2 (4.90)	0 (0.00)	0.184

*By Fisher's Exact Test or Chi-Square Test, as appropriate

Table 3 Distribution of test participants and 7-day point prevalence quit rate according to the number of quitline sessions at the 6-month follow-up visit

Quitline session	No. of participants (n = 41)	No. of participants abstaining from smoking (quit rate)
Initial call without F/U visit	20	1 (5)
Initial call with 1 F/U visit	8	2 (25)
Initial call with 2 F/U visits	5	1 (20)
Initial call with 3 F/U visits	5	1 (20)
Initial call with 4 F/U visits	3	2 (66.70)
Initial call with 5 F/U visits	0	0 (0)

F/U: follow-up visit

Table 4 Self reported secondary outcomes of test and control participants who did not quit smoking at 6-month follow-up visit

Outcome	No. (%) of participants		
	Test group (n = 34)	Control group (n = 51)	<i>p</i> *
Quit attempt rate†	10 (29.40)	1 (2.00)	< 0.001
Smoking reduction rate ‡	19 (55.90)	17 (33.30)	0.039

*By Fisher's Exact Test or Chi-Square Test, as appropriate, †Proportion of non-quitters reported to refrain from smoking at least 24 hours during the study period, ‡Proportion of non-quitters reported to reduced cigarette consumption from the baseline level at both follow-up visits

Discussion

This is the first study conducted in Thailand that was designed to compare the effects of a brief smoking cessation service (the “2 As”: Ask and Advise) for smokers in a dental setting with the effects of offering proactive quitline referral in addition to the “2 As”. According to the study protocol, consented current daily smokers awaiting periodontal treatment were included to participate in the study. Although they were self-selected to receive either of the interventions, all the smoking characteristics were comparable between groups. Therefore, it is possible that differences in the study outcomes could have been caused by the difference in smoking cessation interventions.

The results at the end of the study period (6-month follow-up visit) indicate that there was benefit from additional proactive quitline referral to the quit rate. The reasons to support this conclusion were (1) the 3-month prolonged quit rate of the test group was three times higher than the control group and (2) most of the abstinence in the test group occurred prior to the 3-month follow-up visit and prolonged to the 6-month follow-up visit while most of the abstinence in the control group occurred after the 3-month follow-up visit.

The 7 day point prevalence quit rate at 3-month and 6-month follow-up visits from the present study were 14.6 % and 17.1 %, respectively. These figures were less than those reported by Ebbert et al¹⁸ who also enrolled dental patients in tobacco used quitline (18.3 % and 25.0 %, respectively). The possible explanation for the difference might be that tobacco use quitline counselors in the latter study also discussed pharmacological treatment options with every subject and recommended those who were interested in using these treatment options to contact their physicians for a prescription. Although pharmacological treatment options are available in Thailand, they may be more expensive compared to counselling. In addition, they are not in the most recent National List of Essential Medicines 2004 (making medication use non-reimbursable). Therefore, Thailand National Quitline counsellors helped smokers learn and practice the cognitive and behavioural strategies only.

According to the quitline records, all test participants

received an initial proactive counselling call but none received all five follow-up calls. The lowest quit rate was observed among participants who received only initial call while the highest quit rate was observed among participants who received initial call and 4 follow-up calls. The incomplete quitline services that the participants received might affect the quit rate in the present study since the previous studies had demonstrated a dose-response relationship between quit rates and the number of completed quitline counselling calls.^{18,26} In addition, the first follow-up call seemed to be critical for the participants who in the process of quitting since they might need support to cope with physical withdrawal reaction from nicotine. Only one participant received the first follow-up call (1 week after the quit date).

At the 6-month follow-up visit, while the “2 As” plus proactive quitline referral in the test group resulted in a better quit rate (17 %) in the test group, the “2 As” intervention in the control groups also exhibited a positive result of approximately 6 % quit rate. The lack of no intervention group limited the conclusion that the information about the adverse effects of smoking on periodontal disease and the suggestion to stop smoking given to the smoker only once could stimulate such change in the control participants. Nevertheless, according to a recent Cochrane review²⁷ which 17 trials of brief physician advice versus no advice (or usual care) were pooled, a significant increase in the rate of quitting (relative risk of 1.66 and 95 % confidence interval 1.42 to 1.94) was demonstrated but with a small effect.

Despite the promising outcomes of the “2 As” and proactive quitline referral intervention model, further study is needed to determine patient acceptance of this intervention in dental clinic since it was observed in the present study that none of the test participants completed the follow-up calls and to determine whether subsequent cessation (during periodontal treatment visits) is facilitated among non-quitters who have received this intervention.

This study provides information that the “2 As” in dental setting and proactive quitline referral is a beneficial approach to help smokers who are on a periodontal treatment waiting list. With this approach, smokers receive all the steps of smoking cessation intervention

(the “5 As”) and they have the opportunity to change their smoking habits prior to periodontal treatment. In the upcoming periodontal treatment visits, their smoking status and smoking cessation experience will be re-assessed by dentists. Then, dentists will have the opportunity to provide assistance and support according to patient experience, i.e. encouraging non-quitter to make a quit attempt, helping quitter to avoid relapse and helping relapser to re-quit. Medications (nicotine replacement therapy or non-nicotine replacement therapy) will be recommended and prescribed to relapsers who have experienced intolerable smoking withdrawal symptoms.

Limitations of the study included the following: (1) the inability to randomize the participants since the recruitment protocol was similar to what was done in usual practice, (2) biochemical validation was not used to confirm self reported outcomes in the present study because biochemical validation for low-intensity intervention generally is considered uninformative.²⁸⁻³⁰ and (3) no medications for smoking cessation were prescribed.

Conclusion

In conclusion, offering proactive quitline referral in addition to the “2 As” (Ask and Advise) in a dental clinic appears to be an effective alternative intervention to help smokers on a periodontal treatment waiting list quit smoking. Further study is needed to determine patient acceptance of this intervention and to determine whether subsequent cessation (during periodontal treatment visits) is facilitated among non-quitter who had received this intervention.

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