Published in final edited form as:

J Am Dent Assoc. 2010 August ; 141(8): 1000–1007.

Do faxed quitline referrals add value to dental office-based tobacco-use cessation interventions?

Judith S. Gordon, PhD¹, Judy A. Andrews, PhD², Karen M. Crews, DDS³, Thomas J. Payne, PhD³, Herbert H. Severson, PhD², and Edward Lichtenstein, PhD²

¹University of Arizona, College of Medicine, Dept. of Family and Community Medicine

²Oregon Research Institute, Eugene, OR, USA

³University of Mississippi School of Medicine, Department of Otolaryngology and Communicative Sciences

Abstract

Background—The Ask, Advise, Refer (AAR) model of intervening with patients who use tobacco promotes a brief office-based intervention plus referral to a tobacco quitline. However, there is little evidence that this model is effective. The primary aim of this study was to evaluate the effects on patients' tobacco use of two levels of a dental office-based intervention compared with usual care.

Methods—The authors randomly assigned 68 private dental clinics to one of three conditions: 5 A's (Ask, Advise, Assess, Assist, Arrange); 3 A's (AAR model); or Usual Care, and they enrolled 2,160 participants.

Results—At the 12-month assessment, compared with those in usual care, participants in the two intervention conditions combined were more likely to report cessation of tobacco use, as measured by 9-month prolonged abstinence (3% vs. 2%; $F(1,66) = 3.97, P < .10$) and 12-month point prevalence (12% vs. 8%; $F(1,66) = 7.32, P < .01$). There were no significant differences between participants in the clinics using the 5 A's and 3 A's strategies.

Conclusions—The results of this study are inconclusive as to whether referrals to a quitline add value to brief dental office-based interventions. Patients receiving telephone counseling quit tobacco use at higher rates, but only a small percentage of those proactively referred actually received counseling.

Clinical Implications—The results confirm previous research that training dental practitioners to provide brief tobacco-use cessation advice and assistance results in a change in their behavior, and that these practitioners are effective in helping their patients to quit using tobacco.

Keywords

Tobacco smoking; tobacco; chewing; tobacco-use cessation; smoking cessation; education; dentistry; dental hygienists

The U.S. Public Health Service's¹ 2008 update of its clinical practice guideline, called "Treating Tobacco Use and Dependence," advocates the use of the "5 As" tobacco intervention delivered by health care practitioners. The 5 As are as follows:

Corresponding Author: Judith S. Gordon, PhD, Associate Professor, University of Arizona, Department of Family & Community Medicine, 1450 N. Cherry Avenue, Tucson, AZ 85719, judithg@email.arizona.edu.

Disclosure. None of the authors reported any disclosures.

- Ask the patient about tobacco use;
- Advise him or her to quit;
- Assess his or her willingness to make an attempt to quit;
- Assist the patient in the attempt to quit;
- Arrange follow-up.

However, adoption of the 5 As into routine health care practice has been slow.²⁻⁶ Although the dental care visit provides a unique opportunity for intervention with tobacco users, dental practitioners have been reluctant to provide assistance and follow-up owing to the perception that these are time-consuming activities requiring skills that they do not see themselves as possessing.^{2,7-9} Several organizations (such as the American Dental Hygiene Association) are advocating the use of an Ask, Advise, Refer (AAR) model to overcome these barriers. In theory, referral to tobacco quitlines, which are widely available,¹⁰ can serve to replace the need for dental practitioners to assist and follow up with tobacco-using patients. Research results have verified the effectiveness of telephone counseling.^{1,11-14} Proponents of this approach suggest that an AAR model would reduce the burden on the dental professional while taking advantage of effective telephone cessation counseling. However, few researchers have investigated the use of an AAR model in the dental setting, and the results of their studies are inconclusive regarding its efficacy.¹⁵⁻¹⁷

The primary aim of our study was to examine the effect of a 5 As model versus an AAR-type intervention (3 As) model on patients' tobacco-use cessation. We also compared the effectiveness of these two dental office-based interventions relative to that of usual care by using a planned, orthogonal comparison. Because of the reduced burden on the clinician, as well as the effectiveness of telephone counseling, we expected that participants in the 5 As group would be less likely to quit than those in the 3 As group, and that patients in the combined intervention groups would be more likely to quit than those in the usual-care group.

METHOD

Study time line

The study was approved by the Oregon Research Institute (ORI) Institutional Review Board and conducted from October 2003 through May 2008. We recruited dental clinics during the first year of the project. We enrolled participants between October 2004 and September 2006. All participants completed an informed consent document. We completed follow-up assessments with participants in November 2007 and with practitioners in January 2008.

Study conditions

The 5 As intervention—Dental practitioners in the 5 As intervention group participated in a three-hour workshop containing information on delivering a brief, tailored tobacco intervention to their patients, and they received a CD-ROM program demonstrating the intervention.

The intervention consisted of the following steps:

- ask all patients about their tobacco use at every visit;
- advise by relating oral and systemic health effects of tobacco use and giving direct advice to quit using tobacco;
- assess patients' readiness to quit using brief staging questions;

- assist patients who are interested in quitting by setting a quit date, discussing pharmacotherapy and providing supportive materials;
- arrange follow-up by mail or phone for patients setting a quit date.

Practitioners received reference guides for delivering the intervention, prescribing pharmacotherapy and referring patients to tobacco-use cessation resources. We presented referral to the Mississippi Tobacco Quitline as an option to be considered at the provider's discretion.

The 3 As intervention—We based the 3 As intervention (Ask, Advise, Arrange Quitline Referral) on the AAR model. We modified it to include in the Arrange step a determination of patients' readiness to quit, and referral of only those patients ready to quit in the next 30 days to the quitline, as well as provision of motivational and self-help written materials. Practitioners in the 3 As group participated in a two-hour workshop and received a 3 As version of the CD-ROM program.

The 3 As intervention consisted of the following steps:

- ask all patients about their tobacco use at every visit;
- advise by relating oral and systemic health effects of tobacco use and giving direct advice to quit;
- arrange by determining patients' readiness to quit, then offering or providing detailed information about the Mississippi Tobacco Quitline, encouraging patients to complete a "Fax-to-Quit referral" form for the quitline (which the clinic would fax) and providing written materials.

Usual-care control condition—Practitioners in the usual-care group provided their usual tobacco-use cessation services to patients.

Intervention materials

We gave clinics in both intervention groups a supply of motivational and self-help printed materials for patients, tailored for type of tobacco used and race or ethnicity, as well as information about the Mississippi Tobacco Quitline. We instructed practitioners to give these materials to all tobacco-using patients regardless of their readiness to quit. After completion of the 12-month follow-up for all patients in their clinic, they received an in-service workshop and all intervention materials.

Quitline protocol

During the study period, the Mississippi Tobacco Quitline's standard of care was to provide information and referral resources to all callers, as well as a maximum of six counseling sessions to those interested in receiving assistance. The Mississippi Tobacco Quitline standard protocol for patients who had completed a "Fax-to-Quit" form was to make five attempts to contact them. We made special arrangements with the quitline to increase that number to 10. Quitline staff provided us with aggregate reports on contact with and disposition of participants, and they faxed reports on individual patients to each referring practitioner on a monthly basis.

Clinic and participant recruitment

Sixty-eight private dental clinics consisting of 76 dentists and 252 dental hygienists and dental assistants located throughout Mississippi participated in the study in four cohorts across three years. Eligible clinics each had at least one dentist and one dental hygienist. We

stratified approximately 17 clinics in each cohort by location (to account for differences in patient population) and assigned each of them randomly to one of the three study conditions.

When adult dental patients 21 years and older arrived at a clinic for a regularly scheduled visit, a member of the clinic's front office staff asked them to complete a tobacco use survey. However, we enrolled as study participants only patients who smoked, used smokeless tobacco (ST) or did both. The front office staff informed patients who did not use tobacco that they were not eligible to participate in the study. Enrollment of patients occurred over a six-month period within each clinic. As depicted in the figure, we enrolled a total of 2,177 tobacco-using patients in the study during a three-year period. Of those, 2,160 (99 percent) were eligible to participate in the study. We found the remaining 17 patients to be ineligible owing to age (younger than 21 years) or because they were not patients at the clinic at which they filled out the survey or they had filled out duplicate surveys.

Patient assessments

Patients completed the baseline survey in the clinic at enrollment. This survey included questions assessing demographic characteristics as well as tobacco-use history. The tobacco-use history items included

- number of cigarettes smoked per day;
- readiness to quit tobacco, assessed by means of the question "Are you seriously thinking about quitting smoking in the next 30 days?" and via a contemplation ladder (as described by Biener and Abrams¹⁸);
- number of previous quit attempts;
- level of nicotine dependence, as measured by three items (as derived from the Fagerström Tolerance Questionnaire¹⁹): "How many years have you smoked?", "How soon after waking do you usually smoke your first cigarette?" and "Do you experience strong cravings to smoke when you have to go more than two hours without a cigarette?"

Follow-up surveys were mailed by ORI research staff members at three and 12 months, after enrollment. If participants did not return the survey within two weeks, ORI research staff members called them on the telephone in an attempt to complete the assessment. We measured point prevalence of tobacco use at each assessment by means of the questions "Have you smoked, even a puff, in the last seven days?" and "Have you used smokeless tobacco, even one dip, in the last seven days?" We measured prolonged abstinence by means of the questions "When did you last smoke a cigarette?" and "When did you last use chewing tobacco or snuff?" Response categories ranged from "less than one month ago" to "more than nine months ago." Self-reported abstinence was not biochemically verified, consistent with the public health nature of this trial.²⁰ Within the three-month period of the survey, we asked all participants a dichotomous question (yes/no) about their receipt or use of intervention components, including self-help materials, referral to the tobacco-use quitline and quitline services.

Practitioner assessments

Practitioners completed the baseline assessment before receiving training (in the intervention clinics) or before the beginning of patient recruitment (in usual care). We collected three-month and 12-month follow-up data on practitioners. We personally delivered surveys to dental team participants at these time points, and we reminded them to complete their surveys for up to three months. The baseline survey consisted of 10 demographic and tobacco-use items, and items assessing tobacco-use cessation-related behaviors and barriers to incorporating tobacco-use cessation activities into routine care.

Eighteen items assessed current tobacco-use cessation behaviors (for example, "How often do you ask patients about their tobacco use?"). The possible responses consisted of a five-point scale ranging from "never" (1) to "always" (5). Eight items assessed barriers (for example, "Amount of time required"); the possible responses ranged from "not a barrier" (1) to "a strong barrier" (5). We created the variable of perception of barriers by averaging responses to, all items. The three-month and 12-month assessments consisted of all the items from the baseline survey except for the demographic-related items.

Statistical analyses

We used a generalized, linear, mixed-model analysis of variance with patients nested within clinics to analyze patient outcomes and reported receipt of intervention components. For these analyses, we assumed both clinics and patients nested within clinics to be random. We used an expectation-maximization algorithm to estimate missing data by using an iterative process.²¹ Because there were few practitioners within each clinic, we analyzed practitioner data as random independent observations. For each outcome, we conducted two a priori orthogonal analyses, comparing data from patients and practitioners in the usual-care clinics with those in the two intervention clinics combined and comparing data from patients and practitioners in the clinics using the 5 As techniques with those in the clinics using the 3 As techniques.

RESULTS

Assessment completion

At 12 months, we collected data from 72 percent ($n = 1,551$) of patient participants. A higher proportion of those in the 5 As clinics than in the 3 As clinics completed the assessment (74 percent versus 69 percent; $X^2 = 4,587$, $P > .05$). There were no differences in attrition at the 12-month follow-up, as a function of condition. Respondents and nonrespondents also did not differ in any baseline variables. In addition, we received completed surveys from 70 (92 percent) dentists and 185 (76 percent) dental hygienists and assistants. There were no differences in response rates across conditions.

Participant characteristics

The majority of participants were white (81 percent), were female (60 percent), were married or living with a partner (59 percent) and had at least some college education (60 percent). Most of the participants were smokers (79 percent), 16 percent were ST users and 5 percent reported using both forms of tobacco. Participants reported smoking an average of 0.5 to 1.0 pack per day; ST users reported using an average of two tins per week. The majority of participants (60 percent) smoked, dipped or chewed tobacco within 30 minutes of waking and had used tobacco for an average of 17 years. Participants' average rating of readiness to quit (using the contemplation ladder¹⁸) was 6 on a scale of 0 to 10. One-half of the participants (50 percent) reported that they were seriously considering quitting in the next 30 days, and 54 percent reported having made an attempt to quit in the last year. There were no differences across conditions (usual-care versus intervention conditions combined, or 3 As versus 5 As) in terms of any of the demographic or tobacco-use variables at baseline.

Effect of interventions on patients' abstinence

We used prolonged abstinence (no use of tobacco for at least nine months, allowing for a three-month "grace period"; reported at 12-month follow-up) as the primary outcome; this approach was recommended by the Society for Research on Nicotine and Tobacco subcommittee on intervention methodology as the gold standard in cessation trials.²² To

allow a comparison with outcomes from other cessation trials, we also present 12-month point prevalence. The intraclass correlation coefficients of patients within clinics were .012 for nine-month prolonged abstinence and .015 for 12-month point prevalence. In analyses in which we combined data for smokers and ST users, we found that patients in the intervention clinics were more likely to quit all tobacco use than were those in usual care, as measured by prolonged abstinence (3 percent versus 2 percent; $F_{1,66} = 3.97$, $P < .10$), and 12-month point prevalence (12 percent versus 8 percent; $F_{1,66} = 7.32$, $P < .01$). Although a greater proportion of participants in the 5 As group than of those in the 3 As group quit using tobacco, differences between these two groups of clinics were not significant (Table 1).

Protocol implementation

Table 2 shows data regarding patients' reports of having received the components of the intervention protocols. The percentages are for the two groups combined. Patients in the intervention clinics combined were more likely than were patients in usual care to report that members of their dental team provided the following:

- discussion of their tobacco related oral-health program (69 percent versus 61 percent, $F_{1,66} = 7.12$, $P < .01$);
- discussion of setting a quit date (41 percent versus 29 percent, $F_{1,66} = 17.50$, $P < .001$);
- discussion of tips for quitting (37 percent versus 27 percent; $F_{1,66} = 10.63$, $P < .01$);
- discussion of the use of a nicotine patch, gum or lozenge (38 percent versus 25 percent, $F_{1,66} = 15.12$, $P < .001$);
- prescriptions for pharmacotherapeutics (30 percent versus 20 percent; $F_{1,66} = 7.20$, $P < .01$; $P < .001$);
- written materials regarding cessation of tobacco use (65 percent versus 48 percent; $F_{1,66} = 31.10$, $P < .001$).

There was no difference in the proportion of patients who received follow-up calls. Participants in the intervention clinics were significantly more likely to report that they were asked by their dental practitioners for permission to arrange a "Fax-to-Quit" referral to the Mississippi Tobacco Quitline than those in usual care (40 percent versus 22 percent, $F_{1,66} = 16.25$, $P < .001$). Similarly, patients in the intervention clinics were more likely to report having received a call from the quitline than were patients in usual-care clinics (46 percent versus 26 percent, $F_{1,66} = 30.24$, $P < .001$).

There were few significant differences between patients in 3 As clinics and patients in 5 As clinics. However, patients in the 3 As clinics were more likely to receive a referral than were patients in the 5 As clinics (52 percent versus 29 percent, $F_{1,44} = 31.01$, $P < .001$). In addition, patients in the 3 As clinics (52 percent) were more likely to report receiving a call than patients in the 5 As clinics (40 percent; $F_{1,44} = 8.48$, $P < .01$). Patients in the 3 As clinics were more likely to receive a referral than were patients in the 5 As clinics (52 percent versus 29 percent, $F_{1,44} = 31.01$, $P < .001$).

Effect of telephone counseling on abstinence in the 3 As intervention

At the 12-month follow-up, 101 (16.3 percent) of smokers in the 3 As clinics reported having received quitline counseling. Almost 8 percent ($n = 8$) of those who said they received counseling versus 1.9 percent ($n = 10$) of those who did not receive counseling reported prolonged abstinence (X^2_1 , $n = 619$) = 10.42; $P < .001$). At the 12-month follow-

up, 26 (21 percent) ST users reported having received telephone counseling. Three (12 percent) of those who reported having received counseling reported prolonged abstinence versus 3 percent of those who reported they had not received counseling ($X^2_{1,122} = 3.10$, $P < .10$).

Effect of training on practitioners

We compared practitioners' intervention-related behaviors at baseline and three months after training. We factor analyzed the items we used to assess the behaviors in five categories: ask, advise, assist, arrange 1, and arrange 2 (Table 3). There were significant increases in four of the five behavior categories among practitioners in the intervention group compared with those in the usual-care group. Practitioners in both intervention conditions combined were more likely to advise ($F_{1,62} = 5.26$, $P < .05$), assist ($F_{1,62} = 6.68$, $P < .05$), arrange 1 ($F_{1,62} = 15.84$, $P < .05$), and arrange 2 ($F_{1,62} = 9.62$, $P < .01$) than their counterparts in the usual-care group. When comparing practitioners in the 3 As group with those in the 5 As group, only the arrange 1 behavior was significantly different between groups ($F_{1,41} = 12.58$, $P < .001$), with practitioners in the 3 As group more likely to discuss telephone counseling and refer patients to the quitline via fax than were those in the 5 As group.

We also assessed the effect of the intervention condition on changes in perceived barriers to carrying out the interventions. We conducted analyses of data from dentists and hygienists (combined) who completed both baseline and 12-month surveys ($n = 149$). Results of these analyses indicated that training in either intervention protocol significantly reduced perceived barriers to incorporating tobacco-use treatment into routine care ($F_{1,148} = 12.60$, $P = .001$). There were no differences between the two intervention conditions.

CONCLUSIONS

The results of this study show that tobacco users who received a dental office-based intervention were more likely to quit than were those who received usual care. Analyses indicated that the 12-month point prevalence quit rates among our study's participants generally were comparable with those of participants in other studies.^{6,23,24} There was a trend regarding prolonged abstinence, which is a more stringent criterion than 12-month prevalence; however, it was only marginally significant. There were no significant differences between the two intervention groups. Quit rates in the usual-care group were higher than we expected. This may have been due to a state mandate in Mississippi from 2000 through 2005 to target and train health care professionals to provide brief tobacco-use treatment services.

Encouragingly, more participants in the 3 As clinics versus the 5 As clinics were offered referral to the quitline; 35 percent of all 3 As participants were referred to the quitline, and 70 percent of those were contacted by quitline staff. Patients who received telephone counseling were four times more likely to quit than those who did not. However, the absolute number of patients who received telephone counseling was low. This result is similar to that found by Willett and colleagues¹⁷: that the majority of patients referred by means of fax ultimately do not receive counseling.

Limitations

This study had several limitations. Recruitment into the study suffered owing to the aftermath of Hurricane Katrina, yielding approximately one-half of the anticipated sample. Owing to our assessment schedule, prolonged abstinence was reported by some participants who did not report having quit at the time of the three-month assessment. On the 12-month assessment, the grace period resulted in a lower repeated point prevalence than prolonged

abstinence for smokeless tobacco users in the 3 As condition. Finally, a potential limitation was the lack of biochemical validation, which may have led to over reporting of abstinence.

Clinical implications

The results of this study are inconclusive as to whether referrals to a quitline add value to brief dental office-based interventions. Patients receiving telephone counseling quit at higher rates than those who did not; however, only a small percentage of patients whom study practice staff referred to the Mississippi Tobacco Quitline actually received counseling. The results confirm previous research that training dental practitioners to provide brief tobacco-use cessation advice and assistance results in a change in their behavior-and that these practitioners are effective in helping their patients to quit.

Acknowledgments

This research was funded by grant R01 DA017972 from the National Institutes of Health, National Institute on Drug Abuse, to the Oregon Research Institute, Eugene. This study was a collaboration between the Oregon Research Institute (Judith S. Gordon, principal investigator) and the University of Mississippi Medical Center, Jackson. The authors acknowledge the dentists, dental hygienists, dental assistants and front office staff who gave of their time to participate in this study. In addition, they are indebted to the Mississippi Tobacco Quitline for providing tobacco-use cessation services to the participating patients, maintaining data on the participants and generating statistical reports for the authors' use. They note special appreciation to their research staff-Maureen Barckley, Melanie Bishop, Katie Clawson, Barbara Eisenhardt, Cheryl Grubbs, Debbra Hunter, Julia Martin and Christopher Widdop-for their contributions to this research study and the manuscript of this article.

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ABBREVIATION KEY

3 As	Ask, Advise, Arrange Quitline Referral
5 As	Ask, Advise, Assess, Assist, Arrange
AAR	Ask, Advise, Refer
ORI	Oregon Research Institute
ST	Smokeless tobacco

Figure 1.
Flow diagram of participant enrollment and retention.

Table 1

Self-reported quit rates (in percentages) of patients within clinics

Outcome	Group			
	Usual Care (n = 550)	Intervention		
		Overall (n = 1,610)	5 As* (n = 817)	3 As† (n = 793)
Three-Month Point Prevalence	4.9	5.8	6.6	5.0
12-Month Point Prevalence	7.6	12.0‡	13.2	10.8
Prolonged Abstinence	1.5	3.0	3.3	3.0

* 5 As: Ask, Advise, Assess, Assist, Arrange.

† 3 As: Ask, Advise, Arrange Quitline Referral.

‡ $P < .01$.

Table 2

Participants' self-reported receipt of intervention components, according to group

Intervention Component*	Percentage (no.) reporting receipt, according to group		
	Usual Care	Intervention	
		5 As [†]	3 As [‡]
Information about tobacco-related oral health problems	61.0 [§] (263)	69.4 (454)	67.9 (400)
Collaboration in setting a date to quit tobacco use	29.2 [¶] (126)	40.4 (264)	41.1 (242)
Tips to help quit tobacco use	26.7 [§] (115)	37.2 (243)	37.7 (221)
Information about nicotine gum, patch or lozenge	25.3 [¶] (109)	38.7 (253)	37.2 (219)
Information about bupropion, nicotine inhaler, nicotine nasal spray or other prescription drug for quitting tobacco	20.2 [¶] (87)	30.2 (197)	29.3 (172)
Written materials about tobacco use	47.5 [¶] (201)	64.6 (414)	65.9 (379)
Telephone call after dental appointment about tobacco use	13.2 (55)	14.6 (92)	18.0 (102)
Dentist's or dental team member's inquiry during dental visit about his or her arranging for tobacco quitline to call patient	22.4 [¶] (93)	28.5 (178)	52.2 [#] (298)
Telephone call from tobacco quitline	25.5 [¶] (110)	40.1 (262)	52.4 [#] (308)

* Ascertained by means of the item, "Topics that your hygienist, dental assistant or dentist talked to you about at your last dental visit."

[†] 5As: Ask, Advise, Assess, Assist, Arrange.

[‡] 3 As: Ask, Advise, Arrange Quitline Referral.

[§] Usual care versus intervention, $P < .01$.

[¶] Usual care versus intervention, $P < .001$.

[#] 3 As versus 5 As, $P < .01$.

Table 3

Practitioners' and dental team members' mean scores regarding self-reported behaviors at Baseline and three-month Follow-Up. *

Intervention Behavior, According to Time Point	Group		
	UC	3 A's [‡]	5 A's [‡]
Ask (2 items)			
<ul style="list-style-type: none"> “Ask patients about their tobacco use” “document tobacco use in charts” 			
Baseline	3.99	3.72	3.90
3-month follow-up	4.13	4.18	4.16
Advise (5 items)			
<ul style="list-style-type: none"> “Discuss health hazards of tobacco” “Document soft tissue damage in chart” “Show how tobacco use affects oral health using a mirror or camera” “Advise your patients to quit using tobacco” “Ask dentist to look at oral lesions” 			
Baseline	3.98	3.87	3.92
3-month follow-up	4.16	4.37	4.26
Assist (6 items)			
<ul style="list-style-type: none"> “Discuss strategies or techniques to help patients stop using tobacco” “Encourage patients to set a specific date to quit”, “Give educational materials about tobacco use”, “Document cessation efforts in patient charts” “Talk about over-the counter nicotine replacement products” “Prescribe pharmacotherapy” 			
Baseline	2.67	2.74	2.56
3-month follow-up	3.25	3.85	3.63
Arrange 1 (2 items)			
<ul style="list-style-type: none"> “Encourage your patients to call the Tobacco Quitline” “Fax a consent form to the Quitline” 			
Baseline	1.39	1.38	1.59
3-month follow-up	1.98	3.83	2.51
Arrange 2 (3 items)			
<ul style="list-style-type: none"> “Send a letter or postcard to the patient after the visit” “Telephone the patient after the visit” “Schedule a special visit to assist patient in quitting” 			
Baseline	1.12	1.12	1.08
3-month follow-up	1.23	1.64	1.80

* Responses to each item were on a five-point scale ranging from "never" (1) to "always" (5). Each scale consists of the average response across all items.

[†] 5 As; Ask, Advise, Assess, Assist, Arrange.

[‡] 3 As; Ask, Advise, Arrange Quitline referral.