

Quit Outcomes and Program Utilization by Mode of Entry among Clients Enrolling in a Quitline

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Declaration of Conflicting Interests

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ABSTRACT

Purpose: To investigate how mode of entry into a quitline influences program utilization and quit outcomes among clients seeking cessation services. *Design:* This is a retrospective analysis of clients receiving quitline services from January 2011-June 2016. *Setting:* The study was conducted at the Arizona Smokers' Helpline. *Participants:* Enrolled clients who completed a 7-month follow-up ($n = 18,650$). *Measures:* The independent variable was referral mode of entry (i.e., proactive, passive, and self-referral). Outcome variables included tobacco cessation medication use, number of coaching sessions completed, and 30-day tobacco abstinence at 7 months. *Analysis:* Logistic regression was used to analyze tobacco abstinence after controlling for potential confounders. *Results:* Compared to self-referred clients, proactively referred clients were least likely (OR, 0.88; 95% CI, 0.81–0.97), while passively referred clients were most likely (OR, 1.14; 95% CI, 1.00–1.30), to report tobacco abstinence. Proactively referred (OR, 0.79; 95% CI, 0.70–0.88), but not passively referred, clients were 21% less likely to report tobacco cessation medication use than self-referred clients. *Conclusion:* Proactive referrals are associated with lower utilization of tobacco cessation medication and less successful quit outcomes; however, provider referrals are critical to reaching tobacco users who may have more significant health risks and barriers to quitting. Examining potential barriers among both providers and provider-referred clients is needed to inform improvements in training providers on brief interventions for tobacco cessation.

Key Words: Tobacco, cessation, quitline services, provider referrals; mode of entry

PURPOSE

Smoking continues to be the leading preventable cause of death and disease in the United States, despite decreases in prevalence of tobacco use over time.¹ In Arizona, tobacco use prevalence declined from 19.2%² in 2011 to 14% in 2015;³ however, continuing to reduce tobacco use remains a significant focus of efforts led by the state health department. Consistent with best practices for comprehensive tobacco control programs,⁴ Arizona employs a multi-pronged approach that includes, among other strategies, cessation interventions that focus on the provision of a quitline service and the promotion of change within the healthcare sector to increase the percentage of Arizona residents receiving evidence-based tobacco interventions at the point of care. Since a majority of smokers visit a healthcare provider each year⁵ and physician advice is associated with smokers' intentions to quit,⁶ healthcare providers are uniquely positioned to connect tobacco users with evidence-based treatment services. In fact, health systems strategies for addressing tobacco use capitalize on the rationale that each visit a smoker makes to their healthcare provider presents an opportunity to increase messaging around the benefits of quitting and to discuss treatment for cessation.⁷ Effective treatment, as defined by the U.S. Public Health Service Guideline, includes asking about tobacco use, advising smokers to quit, assessing readiness, providing cessation assistance, and arranging for follow-up (5As).⁸ While rates of asking and advising are relatively high within healthcare settings and are thought to result in increased tobacco cessation service solicitations, corresponding rates of assessing, assisting, and arranging continue to be comparably low among providers.^{9,10} Thus, one recommended strategy to improve assistance in healthcare settings has been to replace the 5As with the truncated *AAR* (Ask, Advise, Refer) brief intervention model, facilitating referrals and directly connecting smokers to evidence-based counseling resources including quitlines.^{7,11}

Quitlines are cost-effective telephone-based services for tobacco cessation and have been considered an integral component of comprehensive tobacco treatment care for over a decade.^{12,13} There is an intuitive appeal of the healthcare provider-referral system as a complementary and cost-efficient service model to expand quitline reach beyond the traditional direct marketing, self-referral model. Yet, research evaluating differential change in clients' smoking behavior within a quitline setting based on referral mode is limited. Prior studies have compared patients referred to quitline services to those who received only brief advice for quitting from physicians and found higher quit rates associated with quitline use.^{14,15} An empirical question remains as to whether quitlines can expect provider-referred smokers to have similar rates of service utilization and quit success as traditional (self-referred) callers. Studies have found that actively recruited smokers, such as those referred by healthcare providers, may differ significantly from smokers who enroll on their own across several sociodemographic and smoking-related characteristics. For instance, compared with self-referred smokers, healthcare provider-referred clients may be more racially diverse and have higher comorbidities, less motivation to quit, less education, and less health insurance coverage,^{16,17} factors that may influence quit rates; though this has not been found to be true in all samples.¹⁸⁻²⁰

Importantly, referrals from healthcare providers may occur either proactively or passively. Proactive referral is when providers follow recommended intervention strategies (e.g., 5As, *AAR*) and use a fax or electronic referral process to send client information (with consent) to the quitline, which prompts a series of outbound call attempts from quitline staff to reach the clients and enroll the referred patients in services. Passive referral is a less intensive but commonly used

approach whereby providers offer smokers quitline information and encourage patients to call on their own. In general, research suggests that proactively referred clients were more likely to enroll in services than passively referred clients.^{21,22} There is an interest in better understanding the association between healthcare provider referral type and quit outcomes for proactive and passive modes of referral as well as comparing outcomes in self-referred versus provider-referred clients. Prior research is sparse and has yielded mixed results. One study found that provider-referred clients (proactively and passively referred combined) were more likely to quit than self-referred clients.²³ Other studies have suggested that long-term quit outcomes may have more to do with service utilization (e.g. use of cessation medication) than mode of entry.¹⁶ A better understanding of these differences can guide strategies that quitlines can use to optimize cessation outcomes across smokers, including tailoring support to address potential variation associated with mode of entry.

The objective of this study is to examine differences across provider proactively referred, provider passively referred, and self-referred clients enrolled in the Arizona Smokers' Helpline (ASHLine)—Arizona's state quitline—in relation to utilization of program services (i.e., medication use and telephone coaching sessions) and quit outcomes. ASHLine uses a protocol-driven provider referral system using the *AAR* brief intervention model that is actively promoted by ASHLine's provider outreach team. Expansion of this approach through designated resources across quitlines nationally will require evidence to support its impact in relation to reducing the tobacco burden. We hypothesized that compared to passively and self-referred clients, proactively referred clients would report greater rates of tobacco abstinence at the 7-month

follow-up. This study adds to the emerging literature by analyzing a larger and more contemporary sample of clients.

METHODS

Design

This was a retrospective analysis of data collected at the ASHLine between January 2011 and June 2016. All assessments were conducted via telephone by trained survey staff using standardized protocols.

Sample

Data were collected from clients enrolled in ASHLine. In keeping with North American Quitline Consortium guidelines, our analysis was restricted to clients who completed a 7-month follow-up assessment ($n = 19,795$). Clients were excluded if data for quit outcome was missing ($n = 7$) or if the client reported being quit at the time of enrollment ($n = 1138$), yielding a final sample size of 18,650. Since the study used de-identified client data, the study protocol was reviewed and deemed exempt by the University of Arizona's Institutional Review Board.

ASHLine's Counseling Program. Upon enrollment into the program, an assigned tobacco cessation coach contacts the client within 24-48 hours. Informed by motivational interviewing and evidence-based cognitive behavioral strategies, coaching includes up to 90 days of telephone counseling, and clients are provided information and guidance on self-regulation, identifying triggers while developing urge management strategies, positive reinforcement, quit smoking tips, preparation for setting a quit day while in-program, and relapse prevention. In addition to

coaching, ASHLine provides up to four weeks of nicotine replacement therapy (NRT) in the form of patches, gum, or lozenges to eligible clients at no cost to the client. Eligibility for services is contingent upon residency (state of Arizona); NRT is contingent on insurance status. Specifically, clients who are Medicaid beneficiaries are ineligible to receive NRT through ASHLine due to an existing comprehensive benefit (i.e., 12-week coverage of any of the 7 FDA-approved tobacco cessation medications) available through Arizona's Medicaid program. Medicaid clients receive the same amount of telephone based behavioral support as non-Medicaid clients and receive support to navigate their health plan for their covered benefit in lieu of a four-week supply of NRT distributed through the quitline.

Measures

Outcome variables. Program utilization variables included self-reported use of tobacco cessation medication during time in-program (0=no; 1=yes) ascertained at the 7-month follow-up, and number of coaching sessions completed. At the 7-month follow-up, clients reporting no tobacco use in the past 30 days were identified as being quit. Quit rates were calculated based on guidelines by the North American Quitline Consortium.²⁴

Independent variable. Mode of entry into the program was categorized as proactive referral, passive referral, or self-referral. Clients referred to ASHLine by their healthcare provider were categorized as proactive referrals (i.e., either via a fax or electronic referral to the quitline). Passive referrals included clients who self-initiated a call to the quitline and when queried on the topic at the time of enrollment indicated that they were encouraged to call the quitline by their healthcare provider (i.e., the quitline did not receive a fax or electronic referral from these

clients' healthcare providers). Self-referrals included clients who self-initiated a call to the quitline (similar to passive referral) but identified hearing about ASHLine through sources other than their healthcare provider, such as media (e.g., television ads, radio, and billboards), community organizations, or a friend or family members.

Covariates. Informed by previous research, potential confounders included age, gender (0=female; 1=male), race (0=white, 1=black, 2=American Indian, 3=other/unknown), education (0=less than high school, 1= high school diploma or greater), and insurance status (0=Medicaid, 1= private, 2=uninsured). Additionally, tobacco behavior-related factors included nicotine dependence, measured using the Fagerström Test of Nicotine Dependence (continuous),²⁵ social support [derived from a five-point scale assessing support to quit smoking, and scores and categorized as 0=low (score 1–2); 1=high (score 3–5)], presence of other smokers in the home (0=no, 1=yes), and self-reported presence of a chronic and/or mental health condition.

Analysis

Baseline characteristics of clients were compared across the three modes of entry using chi-square tests for categorical variables and analysis of variance (ANOVA) for continuous variables. The association between mode of entry (i.e., referral method) and self-reported use of tobacco cessation medication during the ASHLine program was tested using logistic regression. The association between referral method and number of coaching sessions completed during the program (categorized as 0, 1–2, 3–4, and ≥ 5 calls, because the distribution was strongly right-skewed) was tested using multinomial logistic regression, with zero calls as the reference group. The association between referral method and 30-day tobacco abstinence (quit) at 7 months was

tested using logistic regression. All models were adjusted for potential confounders (see Measures above), and the quit outcome model was further adjusted for program utilization (tobacco cessation medication use). All statistical analyses were conducted using Stata 14.2 (StataCorp, College Station, TX).

RESULTS

Sample characteristics

On program entry, clients had a mean age of 51.9 ± 13.6 years and Fagerström score of 4.7 ± 2.3 , and were mostly female (55.7%) and non-Hispanic White (73.1%). Overall, 84.4% of clients had at least a high school education; this proportion was highest among self-referred clients (86.6%) and lowest among proactively referred clients (79.8%) (Table 1). Almost 47% of clients were either uninsured or underinsured (on Medicaid). Fifty-nine percent reported having a chronic health condition and 38% had a mental health condition. Almost half the sample (48.4%) lived with another smoker in the home, with self-referred clients being least likely to live with other smokers (47.4%).

Association between mode of entry and use of tobacco cessation medication

At the 7-month follow-up, 73% of clients reported use of tobacco cessation medication; self-referred clients were most likely (76.5%), and proactively referred clients were least likely (65.7%), to report medication use during their quit attempt (Table 2). In unadjusted models, both passively and proactively referred clients were less likely than self-referred clients to use tobacco cessation medication, but the difference was significant for only proactively referred clients in the fully adjusted model (OR, 0.79; 95% CI, 0.70–0.88).

Association between mode of entry and in-program coaching sessions

The number of coaching sessions ranged from 0 to 135 among clients enrolled in ASHLine services, with a mean \pm SD of 4.7 ± 5.3 and median (IQR) of 3 (1–7). When categorized for analysis, the proportion of clients with 0, 1–2, 3–4, or ≥ 5 coaching sessions was 9%, 31%, 21%, and 39%, respectively. Passively referred clients were the most likely to have 5 or more coaching sessions (41.1%), followed by proactively (39.1%) and self-referred (38.2%) clients. There were no significant associations between mode of entry and number of coaching sessions in the unadjusted or fully adjusted model (data not shown).

Associations between mode of entry and quit outcomes

Overall, 37.6% of the clients in this study successfully quit, defined as 30-day tobacco abstinence at 7 months. The highest and lowest quit rates were among passively (38.8%) and proactively (34.3%) referred clients, respectively. In the fully adjusted model, passively referred clients were significantly more likely to report being quit at 7 months (OR, 1.14; 95% CI, 1.00–1.30), and proactively referred clients were significantly less likely to report quit status (OR, 0.88; 95% CI, 0.81–0.97), than self-referred clients (Table 3). Additional adjustment for program utilization (tobacco cessation medication) slightly strengthened these associations (OR, 1.19 and 0.87 for passively and proactively referred clients, respectively). Further adjustments for number of coaching sessions did not substantially change the estimates (data not shown).

DISCUSSION

The purpose of this study was to examine the associations across modes of entry into quitline services, program utilization, and quit outcomes among quitline callers. Data support self and provider-based referrals as viable approaches to increase quitline utilization. Compared to self-referred clients, proactively referred clients were less likely to report quitting at follow-up.

Specifically, in our sample, quit rates were 38.7%, 38.8%, and 34.3% across self-referred, passively referred, and proactively referred clients respectively. Although the odds of quitting were lower among proactively referred clients, their quit rate exceeds the national average for quitlines (30.2% as reported for fiscal year 2016 by the North American Quitline Consortium²⁶). Proactively referred clients were also less likely to report using tobacco cessation medications during their time in the program, but there were no differences in medication utilization between passively referred and self-referred clients. Finally, there were no differences in the number of coaching sessions across the three groups (proactive, passive, and self-referred). Retention rates at follow-up were also relatively consistent across groups (45.3% proactive, 45.6% passive, and 43.6% self-referred). Our findings are consistent with some of the prior literature.^{16,17}

Differences in quit rates among referral groups may be related to the fact that those receiving interventions from healthcare providers may be different from those self-referring to enroll into the program, as has been shown in previous studies. Specifically, proactively referred clients may have greater comorbidities, less health insurance coverage, lower motivation to quit at the time of enrollment into quitline services.^{16,17} Similarly, in our sample, proactively referred clients were more likely than self-referred clients to be on Medicaid (31.5% vs. 16.8%), report chronic (65% vs. 55%) and mental health conditions (41% vs. 35%), and live with other smokers in the home (50% vs. 47%). Overall, these data suggest that proactively referred clients may represent a higher-risk group of smokers with increased barriers to successful cessation. In fact, these findings are supported by the lower rates of medication use, a factor known to reduce quit success.

Beyond client characteristics, healthcare-based referral models may influence quit success. Brief intervention models incorporating provider advice with referrals to quitlines have been previously tested and shown to be efficacious in increasing access to tobacco cessation services in randomized clinical trials;^{21,22,27} however, the real-world application of such models as tested in this study warrants further attention. First, provider-based referrals by nature require the provider to identify clients who should be referred for services. Ideally, any tobacco user should receive a referral, but evidence suggests not all are. Provider bias as well as caseload and systems strains²⁸ may result in variable referral with a tendency to refer those patients with what is perceived to be a more significant problem or dependence. However, measuring these variables was beyond the scope of this study and is a potential area for future research. Further, there is a wide degree of variability in how provider intervention and referral models (e.g., *AAR*) are implemented across clinical settings, and these inconsistencies may result in variable quit rates.^{10,22,29,30} Additionally, lack of standardization in *AAR* implementation can make it difficult to control for factors that could facilitate client behavior change (e.g., type and/or effectiveness of messaging to patients, accurate management of expectations about quitline services). It is worth noting that we were unable to adjust the statistical models for prior *AAR* training status among the healthcare providers. Finally, the healthcare clinics referring clients in our study spanned a wide range of sectors such as behavioral health, primary care, pediatrics, dental, acute care, specialty care, and so on. Next steps should include examining client outcomes and program utilization across different sectors to see how clinic setting may play a role in smoking behavior change outcomes among clients who are provider-referred to quitline services.

The most interesting finding was the difference in quit outcomes between passively referred and self-referred clients. Passively referred clients are a distinct group. They are similar to the proactively referred group in their receipt of messaging and advice around tobacco cessation from their health care provider, and in that a larger proportion of callers have identified risk factors (e.g., more likely to be on Medicaid, report chronic and/or mental health conditions) compared to those in the self-referred group. However, passively referred clients initiate a call to the quitline (similar to the self-referred group). Thus, passively referred callers may have been more motivated and ready to change their smoking behavior than the proactively referred group. To our knowledge, the only study that examined differences in quit outcomes by all three forms of referrals (Guy et al., 2012) found contrary results, with proactive referrals reporting higher quit outcomes compared to self and passive referrals.²³ Several factors may explain differences in outcomes between the two studies. First, the demographic characteristics of callers to the quitline have changed over time in terms of race, education, and health insurance from 2005-2010 (period in Guy et al. analysis) to the 2011-2016 period analyzed in the current paper. The sample used for the current analysis had a higher proportion of clients who were underinsured or uninsured (47%) versus only 20% in Guy et al. (2012), and was more diverse in terms of race (73% White vs. 90.5% White). Second, while the Guy et al. study controlled for factors associated with nicotine dependence (i.e., time after waking until client smokes, cigarettes smoked), the current analysis controls for additional relevant psychosocial factors known to be related to tobacco use (e.g., presence of chronic and/or mental health diagnoses, social support for quitting, confidence to quit, and presence of other smokers in the home). Finally, there has been a shift in emphasis over time in Arizona to establish relationships with health care providers in behavioral health clinics. These efforts have resulted in a significant increase in proactive

referrals from behavioral health clinics since 2005-2010 (period in Guy et al. analysis) to the 2011-2016 period analyzed in the current paper. Specifically, total number referrals from behavioral health providers increased from 0.84% of all referrals ($n = 254$) to 14.42% of all referrals ($n = 8,630$) across the two periods (measured as the percent change in the proportion of referrals from 2005-2010 to 2011-2016). The increase in outreach to behavioral health providers has contributed to a higher percentage of ASHLine's referred clients reporting a mental health condition, which is known to influence quit outcomes. Taken together, these factors may explain the inconsistent findings between the two studies.

Results from our study should be interpreted with caution. That proactively referred clients have lower quit rates compared to self-referred clients does not undermine the value of a healthcare provider referral model. In fact, it is important to note that proactively referred clients had a quit rate of 34.3%%, which is above the average quit rate (i.e., 30.2%)²⁶ reported across state quitlines nationally in FY2016. More importantly, proactively referred clients constituted a high-risk group of smokers who otherwise may not have enrolled into quitline services without provider messaging and referral, thereby targeting those with co-morbidities and risk factors, who may have the most to gain from quitting.¹¹ Quitlines may want to evaluate the efficacy of developing tailored protocols for provider-referred clients that include more intensive behavioral sessions and support to facilitate continued smoking behavior change. Since healthcare provider training, resources, and interventions may vary across healthcare sectors, next steps could involve a qualitative evaluation of provider-client communication in relation to the referral process in different settings.

This is an observational study conducted in a real-world quitline setting, thus limiting our ability to control for a variety of provider and client-level factors. First, to minimize client burden, mental health in the dataset was captured using a single item that assessed diagnosis and/or treatment of anxiety disorder, depression, bipolar disorder, substance use, or schizophrenia, which fails to differentiate between different types of mental health disorders that may have differential effects on quit outcomes. Second, variables such as organizational-level factors (e.g., standardization in provider training and support for the systematic delivery of tobacco interventions in clinical settings), and client-related psychosocial factors (e.g., motivation) were not assessed. Finally, smoking outcomes were not bio-verified in this study; however, studies show high correlations between self-reported and bio-verified quit reports.³¹ Moreover, collecting data on self-reported abstinence is standard practice among quitlines.

CONCLUSIONS

Provider referral to quitlines is an important aspect of comprehensive tobacco cessation treatment. This study shows that mode of entry into a quitline is associated with differences in service utilization (i.e., tobacco cessation medication) and quit outcomes. Provider referrals are a practical approach to increase quitline reach and utilization. However, health systems change for improving tobacco treatment must overcome organizational barriers to ensure full utilization and sustainability.²⁸ These include time constraints, variations in referrals systems (integrated within electronic health records vs. paper based), gaps in implementation of referral processes, and resource constraints. Moreover, there is a need to evaluate variations in the efficacy of brief intervention processes across provider settings (e.g., primary care, acute care, behavioral health, pediatric clinics). Another area for future research is an examination of how health care providers decide to refer clients to a quitline, factors that may play a role in the referral process

(e.g., client demographics, mental health, and perceived client motivation), and whether referral processes should vary by client characteristics (e.g., motivation or readiness to change). Finally, there is a need to further investigate strategies to increase success among provider-referred clients who enroll in quitline services. These may include new methods for standardizing training of healthcare providers to implement brief interventions and quitline referrals, and strategies for tailoring quitline service delivery (e.g., increased number of coaching sessions, extended periods of quit medication provision) among high-risk clients.

SO WHAT? Implications for Health Promotion Practitioners and Researchers

What is already known about this topic?

Advice from healthcare providers is associated with increased intention to quit tobacco. Tobacco quitlines are cost-effective strategies for cessation. There is an intuitive appeal of the healthcare provider-referral system as a complementary and cost-efficient service model to expand quitline reach beyond the traditional direct marketing (self-referral model). Yet, research evaluating differential change in clients' smoking behavior within a quitline setting based on referral mode is limited.

What does this article add?

This study suggests that mode of entry into a quitline is associated with significant differences in pharmacotherapy service utilization and quit outcomes with passively referred clients more likely to report being quit at 7-month follow-up compared to self- and proactively-referred clients. That proactively referred clients have lower quit rates compared to self-referred clients does not undermine the value of a healthcare provider referral model. Proactively referred clients constitute a high-risk group of smokers who otherwise may not have enrolled into quitline services without provider messaging and referral, thereby targeting those with co-morbidities and risk factors, who may have the most to gain from quitting.

What are the implications on health promotion practice or research?

Provider referrals to quitlines are an important aspect of comprehensive tobacco cessation treatment. There is a need for further investigation into factors that may increase success among provider-referred clients enrolling in quitline services, including variations in the implementation of brief interventions across healthcare sectors and strategies for tailoring quitline service

delivery among high-risk clients who may face unique barriers to successful smoking behavior change.

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Table 1. Baseline characteristics of enrolled ASHLine clients, by referral method (*n* = 18,650): mean ± SD or *n* (%)

Characteristic	Self <i>n</i> = 11,934	Passive <i>n</i> = 1768	Proactive <i>n</i> = 4948	<i>P</i> *
Age	51.6 ± 13.7	53.4 ± 13.6	52.1 ± 13.2	< 0.001
Fagerström score†	4.8 ± 2.3	5.0 ± 2.3	4.5 ± 2.3	< 0.001
Male gender†	5388 (45.5)	691 (39.3)	2117 (43.3)	< 0.001
Race/ethnicity				< 0.001
White	8990 (75.3)	1352 (76.5)	3292 (66.5)	
Black	764 (6.40)	116 (6.56)	363 (7.34)	
American Indian	154 (1.29)	26 (1.47)	106 (2.14)	
Other/unknown	2026 (17.0)	274 (15.5)	1187 (24.0)	
High school education or more†	10,061 (86.6)	1428 (82.5)	3769 (79.8)	< 0.001
Insurance type†				< 0.001
Medicaid	1998 (16.8)	519 (29.4)	1554 (31.5)	
Private	6415 (54.0)	982 (55.7)	2460 (49.9)	
Uninsured	3476 (29.2)	263 (14.9)	913 (18.5)	
Chronic health condition†	6380 (55.2)	1198 (69.7)	3145 (65.1)	< 0.001
Mental health condition†	4043 (35.3)	792 (46.6)	1974 (41.2)	< 0.001
High support from others†	7949 (77.1)	1223 (79.9)	3087 (75.2)	0.001
Other smokers at home†	4784 (47.4)	746 (49.8)	2065 (50.4)	0.003
Confidence to quit†	10,060 (97.0)	1492 (96.8)	3873 (92.9)	< 0.001

* *P*-value calculated from chi-square test for categorical variables or analysis of variance (ANOVA) for continuous variables.

† Missing data: Fagerström score, 4726 (25.3%); gender, 153 (0.8%); education, 582 (3.1%); insurance type, 70 (0.4%); chronic health condition, 540 (2.9%); mental health condition, 703 (3.8%); support from others, 2699 (14.5%); other smokers at home, 2969 (15.9%); confidence to quit, 2571 (13.8%)

Table 2. Association between referral method and self-reported utilization of tobacco cessation medication, using logistic regression

Referral method	<i>n</i> (%)	Crude OR (95% CI) <i>n</i> = 14,400	Adjusted* OR (95% CI) <i>n</i> = 9294
Self	7009 (76.5)	1.00	1.00
Passive	964 (70.6)	0.74 (0.65–0.84)	0.88 (0.75–1.04)
Proactive	2540 (65.7)	0.59 (0.54–0.64)	0.79 (0.70–0.88)

* Adjusted for age, gender, race, education, insurance type, chronic health condition, mental health condition, Fagerström score, support from others, other smokers in the house, and confidence to quit

Table 3. Association between referral method and 30-day tobacco abstinence (quit) at 7 months, using logistic regression

Referral method	<i>n</i> (%)	Crude OR (95% CI) <i>n</i> = 18,650	Model 2* OR (95% CI) <i>n</i> = 12,184	Model 3† OR (95% CI) <i>n</i> = 9294
Self	4620 (38.7)	1.00	1.00	1.00
Passive	686 (38.8)	1.00 (0.91–1.11)	1.14 (1.00–1.30)	1.20 (1.04–1.39)
Proactive	1698 (34.3)	0.83 (0.77–0.89)	0.88 (0.81–0.97)	0.87 (0.78–0.96)

* Adjusted for age, gender, race, education, insurance type, chronic health condition, mental health condition, Fagerström score, support from others, other smokers in the house, and confidence to quit

† Further adjusted for tobacco cessation medication