Interest in an Online Smoking Cessation Program and Effective Recruitment Strategies: Results From Project Quit

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Abstract

Background: The Internet is a promising venue for delivering smoking cessation treatment, either as a stand-alone program or as an adjunct to pharmacotherapy. However, there is little data to indicate what percent of smokers are interested in receiving online smoking cessation services or how best to recruit smokers to Internet-based programs.

Objective: Using a defined recruitment sample, this study aimed to identify the percentage of smokers who expressed interest in or enrolled in Project Quit, a tailored, online, cognitive-behavioral support program offered with adjunctive nicotine replacement therapy patches. In addition, we examined the effectiveness of several individual-level versus population-level recruitment strategies.

Methods: Members from two large health care organizations in the United States were invited to participate in Project Quit. Recruitment efforts included proactive invitation letters mailed to 34533 likely smokers and reactive population-level study advertisements targeted to all health plan members (> 560000 adults, including an estimated 98000 smokers across both health care organizations).

Results: An estimated 1.6% and 2.5% of adult smokers from each health care organization enrolled in Project Quit. Among likely smokers who received proactive study invitations, 7% visited the Project Quit website (n = 2260) and 4% (n = 1273) were eligible and enrolled. Response rates were similar across sites, despite using different sources to assemble the invitation mailing list. Proactive individual-level recruitment was more effective than other forms of recruitment, accounting for 69% of website visitors and 68% of enrollees.

Conclusions: Smokers were interested in receiving online smoking cessation support, even though they had access to other forms of treatment through their health insurance. Uptake rates for this program were comparable to those seen when smokers are advised to quit and are referred to other forms of smoking cessation treatment. In this sample, proactive mailings were the best method for recruiting smokers to Project Quit.

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KEYWORDS

Internet; tobacco dependence; nicotine dependence; smoking cessation; recruitment activities
Introduction

In recent years there has been an explosive growth of Internet users around the world and a corresponding upsurge in interest in using the Internet to deliver online public health interventions such as smoking cessation treatment. The potential advantages of Internet-based treatment are clear: From the users' perspective, online treatment programs are convenient; content can be accessed 24 hours a day, 7 days a week, 365 days a year. They also offer a greater level of anonymity than in-person or phone-based counseling, which users may find appealing. From a delivery perspective, Internet programs allow rapid, broad, and economical treatment dissemination. Programs can be highly tailored to mimic the individualization of one-to-one counseling, and the Internet has the potential to reach audiences who might not seek services otherwise due to issues of cost, accessibility, or stigma.

Whether Internet-based smoking cessation programs will be as effective as person-to-person counseling remains to be proven. To date, very few randomized efficacy trials have been conducted [1], but some promising preliminary data [2-4] suggest that well-designed online cessation programs could be effective public health interventions, particularly when combined with pharmacotherapy [5].

The ultimate impact of any public health intervention, however, is dependent on its reach, as well as its efficacy [6]. Internet-based programs have the potential to reach millions of people, but potential reach is not actual reach. Actual reach requires access, acceptability, and utilization. While ongoing research seeks to establish the efficacy of online treatment, it is equally important to evaluate the acceptability and utilization of these programs in their target audiences. This assessment is hard to do because it requires a defined recruitment population and control over individuals' exposure to program advertisements, which is not possible in most research settings. No published studies to date, that we are aware of, have recruited smokers for Internet-based cessation treatment using a well-defined population that would allow accurate estimates of treatment uptake among smokers. Our best estimates come from surveys of Internet users. According to a recent Pew survey, 7% of adult US Internet users, approximately 8 million people, reported that they have searched online for information on how to quit smoking [7], but searching for information online is not the same as enrolling in an online cessation program. Joining a program requires a higher level of commitment and effort. This could partly explain why only 5-14% of smokers follow through with treatment referrals after being advised to quit [8-10] and less than 7% of smokers in the United States enroll in clinic-based cessation programs [11]. Research is needed that will allow us to better understand the acceptability and reach of Internet-based smoking cessation treatment. Moreover, it is important to understand how best to advertise these programs to smokers to maximize treatment uptake.

In this paper we report on smokers' interest in Project Quit, an online, individually tailored, cognitive-behavioral support program with additive nicotine replacement therapy (NRT) patches. Participants were recruited from two large health care organizations in the United States using a combination of individual-level and population-level recruitment strategies. Working within the health care organizations provided a defined patient population, making it possible to estimate interest in this program among likely smokers who were invited to participate and to evaluate the effectiveness of our recruitment strategies.

Methods

Setting

Project Quit is a collaborative study between the University of Michigan (UM), Group Health Cooperative (GHC), and the Henry Ford Health System (HFHS). The primary purpose of Project Quit is to evaluate the "active ingredients" of an individually tailored, online smoking cessation program. A secondary aim is to evaluate smokers' interest in Web-based cessation treatment and evaluate optimal strategies for promoting this service among smokers. Project Quit is being conducted in two independent phases, each testing slightly different treatment content. This paper reports the recruitment outcomes for the first phase.

The Project Quit Internet program was primarily designed and maintained by the Center for Health Communications Research at UM. Study participants were recruited from the memberships of GHC and the Health Alliance Plan (HAP) of HFHS. Both GHC and HFHS are not-for-profit integrated health care delivery systems. At the time of this study, GHC served more than 540,000 enrollees (adults and children) in Washington State and Idaho. An estimated 200,000 adults and children in the greater Detroit, Michigan area were insured through HAP and received services through HFHS. Both GHC and HFHS/HAP provide behavioral counseling and pharmacotherapy for smoking cessation as covered insurance benefits, but at the time of this study neither offered an online cessation program.

All participants in this study received access to a tailored, cognitive-behavioral treatment program for smoking cessation that was delivered via the Internet. Treatment varied by the type and intensity of tailoring, but all participants received a personally tailored program and a 10-week supply of NRT patches. All treatment was provided free of charge. The study protocol was reviewed and approved by the Institutional Review Board (IRB) of each collaborating institution.

Recruitment

Participants were recruited through a combination of individual-level and population-level strategies. Each of the two health care organizations identified likely current smokers via either automated smoking status data collected during recent medical appointments (Organization 1) or documentation of smoking in electronic medical charts, use of an internal list of smokers collected during prior research, or lists of patients with smoking-related conditions who had previously been prescribed cessation medications (Organization 2). Thus, all invitees were known to have been recent smokers with a high probability of current smoking. Likely smokers were prescreened for minimal inclusion criteria (eg, age) and were mailed a study invitation letter. The letter content was comparable across both health care organizations, but not identical due to different IRB...
requirements. Both letters briefly described the Project Quit program and study eligibility criteria and invited smokers to visit the Project Quit website to learn more about the study and be screened for eligibility. Individuals could also inform study staff if they did not want to be contacted further about this research. Finally, each site allowed people to refer friends and family members to the program, as long as referred smokers were members of one of the health care organizations. Information on how to refer a friend or family member was included in the invitation letter.

After approximately three months, we determined that we needed to boost our monthly enrollment rate to reach our recruitment goal during the study time frame. In an effort to expedite progress toward our overall recruitment goal, we amended the protocol to include a reminder mailing to likely smokers. Reminders were sent to all individuals who, at that point, had not yet visited the website or opted out of further contact regarding the study. From that point forward, reminder letters were sent to all persons who, four weeks after they received the initial invitation letter, had not visited the website or opted out of contact.

We also utilized several population-level enrollment strategies. The study was advertised in each health care organization’s quarterly membership newsletter and was the focus of a feature article in one newsletter issue at Organization 2. Ads appeared in three to four issues total, depending on the site. Each site also advertised through a variety of supplemental strategies. Organization 1 highlighted the program in one issue of its staff newsletter and on the “Join a Study” page of the institution's website. Organization 2 advertised the study during a local promotion of the 2004 Great American Smokeout and allowed physician and nurse referrals, though the latter was not widely promoted among staff. Participants were actively recruited from September 2004 to July 2005.

Letters were proactively mailed to 34533 likely smokers at Organization 1 (n = 18668) and Organization 2 (n = 15865). Quarterly newsletters were mailed to the entire membership of each health care organization, including approximately 563200 adults with GHC or HAP insurance coverage. Based on smoking prevalence data from automated medical records at Organization 1 and regional smoking prevalence estimates for Organization 2 [12], approximately 63180 adults at Organization 1 and 34506 adults with GHC or HAP insurance coverage. Based on smoking prevalence data from automated medical records at Organization 1 and regional smoking prevalence estimates for Organization 2 [12], approximately 63180 adults at Organization 1 and 34506 adults at Organization 2 were smokers. At Organization 1, the staff newsletter ad was distributed to approximately 10000 employees, of whom 1000 were estimated to have been smokers based on internal smoking prevalence data among staff. It is not possible to estimate how many smokers were exposed to the other referral sources (eg, friend and family referrals, website posting).

Each recruitment strategy was associated with a unique referral code. Potential participants used these codes to log in to the Project Quit website. It is possible that some participants were exposed to more than one recruitment strategy (eg, invitation letter and newsletter ad); however, by using the referral codes we were able to track which promotional strategy they were responding to when they enrolled and to which health care organization they belonged. After logging into the site, individuals were able to read an overview of the study, be screened for eligibility, and provide informed consent.

**Participants**

Individuals were eligible to participate if (1) they had smoked at least 100 cigarettes in their lifetime, currently smoking at least 10 cigarettes per day, and had smoked in the past 7 days; (2) were seriously considering quitting in the next 30 days; (3) were 21 to 70 years old; (4) were a member of GHC or HFHS/HAP; (5) had home or work access to the Internet and an email account that they used at least twice weekly; (6) were not currently enrolled in another formal smoking cessation program or currently using pharmacotherapy for smoking cessation; and (7) had no medical contraindications for NRT.

**Results**

**Project Quit Recruitment Response**

During the 11-month recruitment period for phase one of Project Quit, 3256 people from both health care organizations visited the website; 2651 were screened for eligibility (81% of website visitors); 2011 were eligible (62% of website visitors); and 1866 enrolled (57% of website visitors).

We examined the response to each recruitment strategy by evaluating the number of people who responded to each and either visited the website to learn about Project Quit or consented and enrolled in the study (Table 1). Because the total response rate to each of the supplemental strategies (eg, friend and family referrals, website posting, staff newsletter, physician referral) was low, these strategies are combined into a single category in Table 1. Nearly 9% of study participants (n = 159) were referred by friends or family, but response to each of the other supplemental referral sources ranged from 2 to 18 enrollees.

**Table 1.** Response to each recruitment strategy by health care organization

<table>
<thead>
<tr>
<th>Organization</th>
<th>Visited Project Quit Website (N = 3256)</th>
<th>Enrolled in Study (N = 1866)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Letter n (%)</td>
<td>Newsletter n (%)</td>
</tr>
<tr>
<td>1</td>
<td>1224 (75)</td>
<td>260 (16)</td>
</tr>
<tr>
<td>2</td>
<td>1036 (63)</td>
<td>439 (27)</td>
</tr>
<tr>
<td>Both</td>
<td>2260 (69)</td>
<td>699 (21)</td>
</tr>
</tbody>
</table>

*Includes friend and family referrals, web posting, staff newsletter, physician referral, and Great American Smokeout promotion.
The results suggest that the proactive invitation letters were superior to our other recruitment methods, accounting for 69% of people who visited the website and 68% of all enrollees. This finding was consistent across both health care organizations. A greater percentage of the Organization 1 sample was recruited by letter, but the response rate to the proactive letters was nearly equal in both samples. At Organization 1, 6.6% of letter recipients visited the website and 3.9% enrolled. At Organization 2, 6.5% of letter recipients visited the website and 3.4% enrolled. Of those who enrolled, 870 did so after receiving their first invitation letter and 403 did so in response to the reminder letter.

**Interest in Project Quit**

The estimated percentage of adult smokers at each health care organization who enrolled in Project Quit was 1.6% and 2.5%, respectively, for Organization 1 and 2. Although newsletter advertisements were mailed to the entire membership of each health plan, there is no guarantee that smokers saw the population-level advertisements. Thus, a more valid estimate of smokers' interest in this program is based on the sample who received proactive invitation letters (n = 34533). Using this defined sample, we can better estimate the percentage of likely smokers who were interested in the online treatment program after learning about it: 7% of people who received a study invitation letter visited the Project Quit website (n = 2260), 6% of invitees were screened and eligible (n = 2011), and 4% of the total invitees (n = 1273), or 63% of those eligible, enrolled. In total, 651 people were found to be ineligible for this study. The primary reasons for ineligibility were not smoking enough (26%), medical contraindications for NRT (23%), already being enrolled in another smoking cessation program (16%), lack of adequate Internet/email access (14%), not currently being enrolled in a participating health plan (10%), and currently using pharmacotherapy to quit smoking (8%). Of those who were ineligible, 462 visited the website in response to an invitation letter. Compared to persons recruited through all other methods (n = 189), invitation letter recipients were less likely to be ineligible due to age (0.2% vs 2.6%, \( P = .03 \)) or not being currently enrolled in a participating health plan (3.9% vs 25.9%, \( P < .001 \)) and more likely to be ineligible due to current use of another smoking cessation program (11.7% vs 4.2%, \( P = .003 \)) or a medical contraindication for NRT use (26.0% vs 15.3%, \( P = .003 \)). These differences are consistent with our methods for identifying letter recipients.

**Enrolled Participants**

The demographic characteristics of enrolled participants are presented in Table 2. The sample is similar to smokers who enroll in phone counseling programs in that they were ready to quit and were middle-aged, moderate-to-heavy smokers with a history of numerous quit attempts [13-15]. The subsamples differed slightly by health care organization; Organization 2 participants were less likely to be married or living with a partner (\( P < .001 \)), less educated (\( P < .001 \)), less likely to be White (\( P < .001 \)), less comfortable using the Internet (\( P = .02 \)), and smoked slightly more cigarettes per day (\( P < .001 \)).
Table 2. Characteristics of enrolled participants

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>All (n = 1866)</th>
<th>Organization 1 (n = 986)</th>
<th>Organization 2 (n = 880)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Female</td>
<td>1110</td>
<td>59.5</td>
<td>586</td>
</tr>
<tr>
<td>Married/living with partner</td>
<td>1278</td>
<td>68.5</td>
<td>682</td>
</tr>
<tr>
<td>Employed</td>
<td>1421</td>
<td>76.2</td>
<td>749</td>
</tr>
<tr>
<td>Education*</td>
<td>451</td>
<td>24.2</td>
<td>204</td>
</tr>
<tr>
<td>High school/GED or less</td>
<td>222</td>
<td>11.9</td>
<td>141</td>
</tr>
<tr>
<td>Vocational/technical school</td>
<td>1050</td>
<td>56.3</td>
<td>564</td>
</tr>
<tr>
<td>Some college</td>
<td>136</td>
<td>7.3</td>
<td>71</td>
</tr>
<tr>
<td>Postgraduate degree</td>
<td>1486</td>
<td>79.6</td>
<td>831</td>
</tr>
<tr>
<td>Caucasian*</td>
<td>1218</td>
<td>65.3</td>
<td>668</td>
</tr>
<tr>
<td>3 or more prior quit attempts†</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>46.3</td>
<td>10.7</td>
<td>46.5</td>
</tr>
<tr>
<td>Cigarettes per day*</td>
<td>21.8</td>
<td>9.3</td>
<td>21.0</td>
</tr>
<tr>
<td>Motivation to quit†</td>
<td>8.3</td>
<td>1.7</td>
<td>8.3</td>
</tr>
<tr>
<td>Comfort using the Internet† ‡</td>
<td>6.8</td>
<td>3.7</td>
<td>7.0</td>
</tr>
</tbody>
</table>

*Significant difference between organizations, \( P < .001 \)
†Significant difference between organizations, \( P < .05 \)
‡Scores range from 1 to 10.

We also compared participants who were recruited by proactive invitation letter to those recruited by newsletter. Newsletter-recruited participants were more likely to be female (64.1% vs 58.2%, \( P = .03 \)), Caucasian (88.6% vs 77.5%, \( P = .06 \)), and older (47.0 vs 45.0 years, \( P = .001 \)). There were no significant differences in education, marital status, motivation to quit smoking, comfort using the Internet, or the number of cigarettes smoked per day.

**Discussion**

**Principle Results**

We found that smokers were interested in participating in Project Quit, a Web-based smoking cessation treatment program, even when they had access to other forms of comprehensive intervention through their health insurance. Of those who received a study letter and were invited to be screened for eligibility, 7% visited the website and 4% were eligible and enrolled. While these numbers may appear low, they are comparable to follow-through rates (5-14%) for referrals to other forms of cessation counseling [8-10]. Moreover, nearly two-thirds of those eligible (63%) agreed to enroll.

To our knowledge, this is the first study to document the level of interest in an online smoking cessation treatment program. We believe this is an important finding. Online cessation programs are becoming more prevalent on the Web. Whether or not they will be as efficacious as person-to-person counseling remains to be proven, yet no matter how efficacious an Internet cessation program is, its effectiveness will ultimately be dependent on its acceptability and utilization. These findings suggest that online cessation treatment can have comparable appeal to other forms of behavioral counseling, especially when part of a comprehensive intervention that combines cognitive behavioral counseling with pharmacotherapy, as is the best practice recommendation for tobacco dependence treatment [11].

While the uptake rate for Project Quit is comparable to that of other forms of therapy, these results may not generalize to other online cessation programs. Based on participants' self-report at follow-up, we know that a substantial portion of smokers were interested in receiving NRT. Online programs that do not offer the option of pharmacotherapy may be less appealing to smokers, at least to those with adequate health care coverage and other treatment options. Furthermore, our enrollment rate may have been limited by the eligibility criteria of our study. We selected adult smokers, with access to the Internet, who were ready to quit smoking and had no contraindications for NRT use. Higher enrollment may be seen for programs with less restrictive inclusion criteria. Finally, response rates may differ in populations with different base rates of smoking. Our primary take rate (4%) is based on the percentage of likely smokers who received a proactive letter announcing the program. We selected people to receive these invitation letters based on internal data documenting their recent smoking. Unfortunately, population-level annual quit rates are fairly low in the United States. Each year, only about 2.5% of smokers successfully quit smoking permanently [16]. Thus, we have
reasonable confidence that the majority of individuals contacted were still smoking when they received the letters, but we cannot confirm the exact percentage who were smoking at contact. Less treatment interest may be found in future populations if the base rate of smoking is lower than in this study, and vice versa.

As a secondary outcome we examined the success of our various recruitment strategies and found that proactive, individual outreach was a more effective recruitment strategy than mass advertising. More study participants visited the website and enrolled in response to proactive invitation letters than to all other forms of recruitment. This finding may not be surprising. While our population-level advertisements had the potential to reach a greater number of people (> 560000 adults), there was no guarantee that they were actually seen by their intended audience of smokers (approximately 98000 adults). Consequently, we cannot directly compare the draw of the newsletter ads to our invitation letters or other referral strategies, but we can comment broadly on the effectiveness of each strategy as a means of outreach for this study. In addition, we cannot assume that people were not exposed to more than one recruitment strategy or that multiple exposures did not have some impact, but using our unique referral codes, we can state with confidence which promotional strategy participants were responding to when they visited the Project Quit website. Nearly 70% of all visitors responded to the invitation letters proactively mailed to likely smokers. This finding has implications for future research, as well as community-based treatment dissemination efforts. Proactive contact was possible in this trial because of our access to automated data and other internal indicators of smoking status, but a similar outreach strategy could be implemented in the community using commercially available mailing lists of smokers or mailing lists from state or national smoking quit lines of likely smokers. More widespread recruitment could be achieved via commercially available email address lists. Even if it were not possible to limit email distribution to likely smokers, the cost per recipient would be low enough to make this a cost-effective recruitment strategy.

Conclusion
The results of this study add to the small but growing literature on Internet-based smoking cessation treatment and suggest that online intervention can be as appealing to smokers as other forms of treatment, but utilization may be dependent on the overall program content and effective promotional outreach. Future research should continue to evaluate smokers’ interest in using online services, among both insured and uninsured individuals. Additional methods for promoting utilization of online programs should also be explored. A greater understanding of these issues will be important for effectively delivering efficacious online cessation services in the future.

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Conflicts of Interest
Dr. Strecher is a shareholder in HealthMedia Inc, a company that builds and disseminates computer-tailored smoking cessation programs. He has also undertaken consultancy and research for, and received travel funds from, manufacturers of smoking cessation products, including GlaxoSmithKline.

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Abbreviations

GHC: Group Health Cooperative
HAP: Health Alliance Plan
HFHS: Henry Ford Health System
IRB: Institutional Review Board
NRT: nicotine replacement therapy
UM: University of Michigan

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