



## Online smoking cessation program for Korean Americans: Randomized trial to test effects of incentives for program completion and interim surveys



Joel M. Moskowitz\*, Diana D. McDonnell, Gene Kazinets, Hyun-Ju Lee

Center for Family and Community Health, School of Public Health, University of California, Berkeley, Berkeley, CA, USA

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### ABSTRACT

**Introduction.** Smoking is prevalent among Korean American men. Quitting is Winning, an Internet-based, cognitive-behavioral smoking cessation program, was developed using community-based participatory research principles.

**Methods.** A randomized controlled trial was used to evaluate whether participants were more likely to complete the program and quit smoking at 6-months of follow-up with additional reinforcement. The main outcomes were the proportion of participants who completed the online program and the proportion who quit smoking for at least 30 days, 26 weeks after enrollment, among those randomized into the high-reinforcement (HR) condition compared with those in the low-reinforcement (LR) condition.

**Results.** The study achieved a final enrollment of 403 participants including 56 women. Program completion was greater for the HR as compared to the LR condition (17% vs. 10%,  $p = .035$ ). There was no significant difference in 30-day smoking cessation (intent-to-treat [ITT]) between the HR and LR conditions (9% vs. 8%, ns). Smoking cessation was greater among program completers as compared to those who did not complete the program (28% vs. 5%,  $p < .001$ ).

**Conclusions.** The addition of interim surveys and financial incentives for interim survey completion and program completion significantly increased the likelihood of program completion. Moreover, program completers were significantly more likely to quit smoking. Although smoking cessation rates did not significantly differ between the HR and LR conditions, the results suggest that future studies should explore the efficacy of larger financial incentives for program completion (Clinical Trial #NCT02584127).

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### Introduction

The smoking prevalence of Korean Americans (KAs) is among the highest of all major ethnic groups. In a survey of California adults, 20.3% of KAs were current smokers, second only to American Indian/Alaskan Natives (Holtby et al., 2008). For those who seek to quit, the Internet offers widespread access to smoking cessation information with the added advantages of interactivity and information tailoring (Cline and Haynes, 2001), important motivators for health information-seeking behavior (Frisby et al., 2002). Recent research shows that smokers are more likely to seek health information and support through Internet sources (Shahab et al., 2014). The Internet also offers unique opportunities to interact with people who are geographically dispersed and linguistically isolated. A meta-analysis of nine Internet-based smoking cessation studies found that, overall these programs were

successful in helping adults quit smoking (Myung et al., 2009). Although several online smoking cessation programs are available in the U.S., they are primarily designed for English speakers and tend to lack cultural sensitivity for KA smokers.

Because most KA smokers are highly educated, heavy Internet users, and use the Internet to access health information (Lee et al., 2006), the Internet has the potential to be a powerful intervention tool for this group. Moreover, it is feasible via Internet to reach smokers who would not ordinarily enroll in a traditional cessation program. Most smokers who try to quit smoking experience psychological barriers to seeking help for quitting (Kim et al., 2013). The Internet can reach these smokers and provide them with self-help cessation materials in various settings, including their homes (Cline and Haynes, 2001; Frisby et al., 2002). Interventions that are available to smokers where they are, such as telephone quit lines or Web-based interventions, can increase success of cessation services whether they are used alone or in combination with other methods (Puckett et al., 2015; McClure et al., 2014).

"Quitting is Winning" is a community-based participatory research project that evaluated the effectiveness of an online, self-help smoking

\* Corresponding author at: Center for Family and Community Health, School of Public Health, University of California, Berkeley, 50 University Hall, Berkeley, CA 94720-7360, USA.

E-mail address: [jmm@berkeley.edu](mailto:jmm@berkeley.edu) (J.M. Moskowitz).

cessation program for Korean Americans. The program was adapted from the “Stop Smoking Center” by Evolution Health Systems (Toronto, Ontario) and has been described previously (McDonnell et al., 2010). It is a cognitive-behavioral program based on the stages of change described in Prochaska’s Transtheoretical Model (DiClemente and Prochaska, 1982).

The first evaluation of the Quitting is Winning program occurred between 2005 and 2009 (McDonnell et al., 2011). In that study, one group received access to the Quitting is Winning online program for 12 months. The randomized comparison group received a printed booklet version of the online program. Both versions of the program were offered in English and Korean. At one year follow-up, 10% of participants in both conditions quit for at least 30 days, a cessation rate comparable to other self-help smoking cessation interventions. The program was especially effective for people who completed the entire online program—27% of this subgroup quit smoking, compared to 8% of those who did not finish the program. However, only 10% of participants in the online program condition completed the program.

Based upon the prior results, including reports from participants that the interim surveys were helpful, we hypothesized that offering interim surveys and financial incentives for program completion would increase smoking cessation.

Research in eHealth, as well as results from our prior study, has highlighted the issue of low or infrequent use of behavioral intervention programs (Ritterband et al., 2009). Modest financial incentives have been associated with significantly higher rates of smoking cessation, program enrollment and program completion, as well as higher short-term quit rates (Sarna et al., 2009). Responsiveness to eHealth intervention varies, and may depend on subgroup or personal characteristics (Reinwand et al., 2015). Financial incentives may be an effective method to motivate behavioral change, including participation in smoking cessation programs, but optimal size and timing of incentives has not been established (Halpern et al., 2015; Hibbard and Greene, 2014).

A Cochrane review that examined incentives for quitting smoking concluded that substantial cash payments boosted cessation rates for as long as they were in place (Cahill et al., 2015). A recent study that compared financial incentive conditions for smoking cessation with a reward valued at \$800 arrived at a similar conclusion (Halpern et al., 2015).

However, the use of *substantial* cash incentives for achieving risk reduction may be controversial due to the potential coerciveness of the rewards, or may be impractical for program developers. Thus, we sought to determine whether *modest* financial incentives would suffice to motivate volunteers to complete a smoking cessation program as there is limited supportive evidence for this approach (Gingerich et al., 2012).

Some research has found that adherence to a cessation program was one of the most important factors in a quit attempt (Graham et al., 2013; Elfeddali et al., 2012; Zbikowski et al., 2008). A study on the effectiveness of an open-access, Spanish language, Internet-based smoking cessation program found that, while the program was accessible, the level of attrition was high and researchers concluded that professional support and a payment system may increase program retention (Mañanes et al., 2014).

The present study attempted to compare a “real-world” situation in which there was minimal support and guidance while using an Internet-based program versus a situation where users received virtual “support” through interim surveys in addition to incentives for program completion.

“Quitting is Winning II” (QiW II) is an online smoking cessation program specifically designed for Korean Americans. In a randomized controlled trial, participants were assigned either to a high reinforcement condition which included interim surveys and incentives for each survey completed and program completion, or to a low reinforcement condition with no interim surveys or financial incentive for program completion. The study measured two primary outcomes: the proportion of participants who completed the program and the

proportion of participants who quit smoking for at least 30 days at the end of the study (26 weeks after enrollment).

## Methods

We randomly assigned participants to two study conditions that differed in terms of financial incentives and existence of interim surveys. The low reinforcement (LR) condition more closely simulated how a conventional program might be disseminated. The high reinforcement (HR) condition included online interim surveys with financial incentives for these assessments and also for program completion. All study materials were available in English and Korean. In the HR condition, participants received reminders about the incentive for program completion with each monthly reminder to complete the interim survey.

In both study conditions, all participants completed an online baseline survey and were provided access to the QiW II online smoking cessation program. Six months after study enrollment, all participants were offered \$25.00 to complete the online follow-up survey. In the HR condition, participants were also offered \$2.00 to complete each of five monthly interim surveys and \$25.00 for completion of the program.

### Smoking cessation program

The QiW program was adapted from the Stop Smoking Center program (Evolution Health, Toronto, Canada), a cognitive-behavioral, self-help program based on the stages of change described in Prochaska’s Transtheoretical Model (DiClemente and Prochaska, 1982). The program includes six modules that lead participants through the stages of quitting, along with an additional component that addresses relapse and withdrawal symptoms.

To increase utilization of the QiW II program, we developed short introductory videos for each of the six modules using computer animations developed by DesignBank (Dublin, CA), a Korean American-owned company. The videos were also available in English and Korean.

### Study participants

Participants were recruited between July 2012 and September 2013. We relied on online advertising via Google AdWords (<http://adwords.google.com>), as this was the most cost-effective tool for participant recruitment in our first QiW study (McDonnell et al., 2010). All advertising was in Korean to differentiate our program from other online programs and to attract the appropriate target population.

We also promoted the study to participants in our first study. We mailed them a letter and sent an email that summarized the results of the first study and invited them to participate in the updated program if they were still smokers, and to encourage other KA smokers to enroll.

When potential enrollees clicked on our Google ad or the link in the recruitment email, they were taken to a brief study description and were asked to complete a screener survey that determined their eligibility for the study. Eligibility criteria included self-identified KA ethnicity, age 18 years or older, daily smoker (i.e., smoked at least one cigarette per day during the previous seven days), and current U.S. resident. Eligible respondents were also required to have a valid email address and regular Internet access.

Once eligibility was established, potential participants were emailed a link to the baseline survey. The survey assessed smoking status and behaviors (e.g., quantity, frequency, and time first smoked in the morning), intention to quit, quit attempts, cessation self-efficacy, prior use of cessation methods, Fagerstrom Test for Nicotine Dependence (Heatherton et al., 1991), and social support for quitting. Information on demographics, socioeconomic, acculturation, and psychological distress (6-item Kessler scale (Kessler et al., 2002)) was also collected. The follow-up survey, administered at the end of the six month study, was similar to the baseline survey.

As illustrated in Fig. 1, respondents provided informed consent after completion of the baseline survey, after which they were considered enrolled. After enrollment, participants were randomized by the online survey software (Qualtrics™, Provo, Utah) to either the HR or LR group. Because our hypothesis was that completing regular assessments is part of the ideal dissemination package, people in the HR condition also received five brief, online interim surveys at 30-day intervals. These were designed to remind participants that they were in the process of quitting, and to help them reflect on their progress, goals, and barriers. Although participants were not blinded as to whether they were in the HR or LR group, they were not aware of the other group’s structure.

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