

Original Paper

# Exploring the Utility of Web-Based Social Media Advertising to Recruit Adult Heavy-Drinking Smokers for Treatment

Krysten W Bold<sup>1</sup>, PhD; Tess H Hanrahan<sup>1</sup>, M.Res.; Stephanie S O'Malley<sup>1,2</sup>, PhD; Lisa M Fucito<sup>1,2,3</sup>, PhD

<sup>1</sup>Yale School of Medicine, Department of Psychiatry, New Haven, CT, United States

<sup>2</sup>Yale Cancer Center, New Haven, CT, United States

<sup>3</sup>Smilow Cancer Hospital at Yale-New Haven, New Haven, CT, United States

**Corresponding Author:**

Krysten W Bold, PhD

Yale School of Medicine

Department of Psychiatry

Connecticut Mental Health Center

34 Park Street

New Haven, CT, 06519

United States

Phone: 1 2039747603

Fax: 1 2039745790

Email: [krysten.bold@yale.edu](mailto:krysten.bold@yale.edu)

## Abstract

**Background:** Identifying novel ways to recruit smokers for treatment studies is important. In particular, certain subgroups of adult smokers, such as heavy-drinking smokers, are at increased risk for serious medical problems and are less likely to try quitting smoking, so drawing this hard-to-reach population into treatment is important for improving health outcomes.

**Objective:** This study examined the utility of Facebook advertisements to recruit smokers and heavy-drinking smokers for treatment research and evaluated smoking and alcohol use and current treatment goals among those who responded to the Web-based survey.

**Methods:** Using Facebook's advertising program, 3 separate advertisements ran for 2 months targeting smokers who were thinking about quitting. Advertisements were shown to adult (at least 18 years of age), English-speaking Facebook users in the greater New Haven, Connecticut, area. Participants were invited to complete a Web-based survey to determine initial eligibility for a smoking cessation research study.

**Results:** Advertisements generated 1781 clicks and 272 valid, completed surveys in 2 months, with one advertisement generating the most interest. Facebook advertising was highly cost-effective, averaging \$0.27 per click, \$1.76 per completed survey, and \$4.37 per participant meeting initial screening eligibility. On average, those who completed the Web-based survey were 36.8 (SD 10.4) years old, and 65.8% (179/272) were female. Advertisements were successful in reaching smokers; all respondents reported daily smoking (mean 16.2 [SD 7.0] cigarettes per day). The majority of smokers (254/272, 93.4%) were interested in changing their smoking behavior immediately. Many smokers (161/272, 59.2%) also reported heavy alcohol consumption at least once a month. Among smokers interested in reducing their alcohol use, more were heavy drinkers (45/56, 80.4%) compared to non-heavy drinkers (11/56, 19.6%;  $\chi^2_{[1, N=272]}=13.0, P<.001$ ). Of those who met initial screening eligibility from the Web-based survey, 12.7% (14/110) attended an in-person follow-up appointment.

**Conclusions:** Social media advertisements designed to target smokers were cost-effective and successful for reaching adult smokers interested in treatment. Additionally, recruiting for smokers reached those who also drink alcohol heavily, many of whom were interested in changing this behavior as well. However, additional social media strategies may be needed to engage individuals into treatment after completion of Web-based screening surveys.

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**KEYWORDS**

smoking; alcohol drinking; social media; research subject recruitment

## Introduction

Identifying novel ways to recruit smokers for treatment is important. Tobacco use remains a large public health problem [1,2], and most smokers who try to quit each year do so without any form of treatment (68.3%) [3] and rarely achieve lasting abstinence [3]. Certain subgroups of adult smokers, such as heavy-drinking smokers, may be especially at risk given evidence that they are less likely to try quitting smoking [4-7] and have greater odds of serious medical problems, including cancers, liver cirrhosis, and pancreatitis [8-11]. Thus, drawing smokers and heavy-drinking smokers into treatment is important for improving health outcomes.

Research suggests there is a large subgroup of smokers who also drink heavily. In national samples, approximately 6.2 million US adults have co-occurring nicotine dependence and an alcohol use disorder [12]. Additionally, rates of binge (ie,  $\geq 5$  drinks on the same occasion) and heavy alcohol use (ie, binge use  $\geq 5$  times in the past month) are more than twice as high in smokers compared with non-smokers (binge: 42.9% smokers, 17.5% nonsmokers; heavy drinking: 15.7% smokers, 3.8% nonsmokers) [13].

Although most heavy drinkers do not seek treatment [14], smoking status may be a way of identifying heavy drinkers [15] and engaging them in treatment. Recently, Internet-based recruitment strategies have been evaluated as alternative methods for reaching and engaging individuals into treatment and clinical research. Social media advertising, such as through Facebook, was more cost-effective for reaching young adult smokers in a national Web-based survey study, totaling \$4.28 per survey, and produced more valid results than other Web-based advertisements (eg, Craigslist) or recruitment methods through survey companies [16]. Another study indicated that Web-based recruitment captured a greater proportion of people with substance use and mental health issues compared with alternative recruitment methods (ie, flyers, university courses) [17]. Others have successfully used social media advertising to reach targeted audiences for substance use research, including difficult-to-recruit populations such as young adults [18], veterans [19], immigrants [20], and Latino smokers [21]. These studies suggest Web-based advertising may be a useful tool to consider for recruiting heavy-drinking smokers as well.

Given the widespread use of social media by the general adult population [22], and research highlighting the usefulness of Web-based recruitment strategies, we sought to examine the utility of Facebook advertising to recruit adult smokers from the community for treatment. The primary aims of the study were to (1) evaluate the effectiveness of Facebook advertising to reach adult smokers and a subpopulation of heavy-drinking smokers and (2) characterize smoking and alcohol use and current treatment goals among responders. Identifying who responds to smoking advertisements on social media may

suggest new ideas for recruitment or innovative Web-based interventions to address substance use.

## Methods

### Participants

The target population was adult smokers living in the greater New Haven, Connecticut, area who were interested in participating in smoking cessation treatment research. Individuals had to be literate in English to complete the Web-based survey.

### Facebook Recruitment

We utilized Facebook's advertising program for 2 months from April 13, 2015 through June 16, 2015. We created 3 advertisements that appeared on the Facebook pages of our target audience (at least 18 years old) within a geographic radius of 30-40 miles from New Haven, Connecticut, given our interest in recruiting individuals able to participate in an in-person treatment research study. All 3 advertisements targeted smokers interested in treatment by presenting images of cigarettes with the phrase "Want to quit smoking? We can help" (Figure 1). Facebook approved all advertisements. The presentation of advertisements to users was not randomized; all 3 advertisements were uploaded simultaneously to the Facebook platform with identical settings. The Facebook advertisement delivery system was set to optimize advertisement presentation over time. This system rotates through the advertisement presentation to display all 3 advertisements in the set, and when it is determined that an advertisement is performing better than others (ie, greater number of clicks), this advertisement is selected by the program to be displayed more often.

We selected days when we wanted the advertisements to run; the advertisements ran for 14 days in total over 2 months. We specified a spending limit for the entire advertising campaign (3 advertisements) of \$25 per day. On days when advertisements were running, Facebook set pricing for the campaign (ie, a "bid") that was used to calculate a competitive value (ie, sum of the bid plus the advertisement's intrinsic quality, measured by past performance). Bids are entered into an auction where all advertisers compete for their advertisement to be shown to their target audience. Facebook monitors competing bids from other advertisers and optimized our advertisement pricing based on our spending limit to enhance the likelihood that the advertisement would win an auction and be visible to Facebook users [23]. Facebook monitored the number of impressions (ie, each time an advertisement is shown to a user), total reach (ie, number of people seeing the advertisements), clicks on the advertisements, and total cost for all advertisements. We used this data to evaluate the success of each advertisement and cost-effectiveness in obtaining survey responses. In accordance with Facebook's data use agreement, we present aggregated anonymous results.

**Figure 1.** Facebook advertisements designed to target smokers interested in quitting.

## Study Procedures

The Yale Institutional Review Board approved all study procedures. After clicking on the advertisement, participants were brought to a website that described the purpose of the survey for determining preliminary eligibility for a treatment research study. Participants were informed that their responses were confidential and were told they could skip questions they did not wish to answer although this may affect their eligibility. Participants were given contact information for research staff if they had questions or preferred to complete the screening by phone. Participants provided informed consent by selecting “yes,” indicating they understood this information, were at least 18 years old, and wished to complete the Web-based survey. Participants were not offered any incentives for completing the survey, but the advertisement indicated paid participation in the research study (up to \$170) and free FDA-approved smoking cessation treatment if eligible. Survey participants entered contact information (email addresses and/or phone number) to facilitate scheduling an intake for the treatment research study. Responses were screened for duplicate entries and were excluded from the current analysis if the same email address or phone number was listed across multiple surveys.

## Assessments

The Web-based survey contained 18 questions and took 5-10 minutes to complete. Multiple-choice responses provided an option for participants to select “No” or “I choose not to answer.”

## Demographics

To ensure that Web-based surveys were brief, data were only collected about participant age and sex, which were used to assess initial eligibility for the main treatment research study (eg, females who were currently pregnant or nursing were excluded).

## Smoking History

Participants reported the number of cigarettes they currently smoke and their interest in reducing their cigarette use rated “immediately,” “at a later date,” “I am not interested in reducing my cigarette use,” or “I choose not to answer.”

## Alcohol Use History

Frequency of heavy alcohol use was assessed by asking participants to select how frequently they consumed 4 or more (if female) or 5 or more (if male) standard drinks using National Institute on Alcohol Abuse and Alcoholism (NIAAA) guidelines for heavy drinking [24]. Categorical response options included “every day,” “5 to 6 times a week,” “3 to 4 times a week,” “1 to 2 times a week,” “2 to 3 times a month,” “once a month,” and “never.” Participants were provided information about standard drink equivalents (ie, 12-ounce bottle of beer, 5-ounce glass of wine, one shot of hard liquor by itself or in a mixed drink). Desire to reduce alcohol use was rated “yes,” “maybe at a later date,” or “no.” Alcohol withdrawal symptoms were assessed by asking participants if they experienced 10 specific symptoms when they cut down or stopped drinking (eg, sweating, vomiting, seizure, hallucinations) rated “yes,” “no,” “I choose not to answer,” or “N/A” if participants had never cut down or stopped drinking.

## Other Eligibility Screening Questions

Screening questions regarding whether participants would be available and eligible for the in-person treatment program included “are you currently taking part in any other research study,” “do you have a permanent address and phone number (yes or no),” and “are you planning on moving out of the greater New Haven area in the next 6 months?” Additionally, participants were asked if they were currently pregnant or nursing, being treated for any medical problems, currently taking any prescription medications, and had a history of treatment for psychiatric problems. They were prompted to provide free-response text to specify the condition or medication.

## Initial Screening Eligibility

Completed surveys were evaluated by research staff to determine initial eligibility for participation in a treatment research study. Eligibility criteria for being invited for an in-person intake evaluation included being at least 18 years old, currently smoking cigarettes, reporting at least 1 heavy drinking day in the past month, no history of severe alcohol withdrawal (eg, hallucinations), not currently participating in another research study, reporting having a permanent address and phone number, not planning to move in the next 6 months, not currently

pregnant or nursing, not currently using medication to treat alcohol or tobacco use (eg, naltrexone, varenicline, bupropion, nicotine replacement), and no history of serious psychiatric illness (eg, schizophrenia, bipolar disorder).

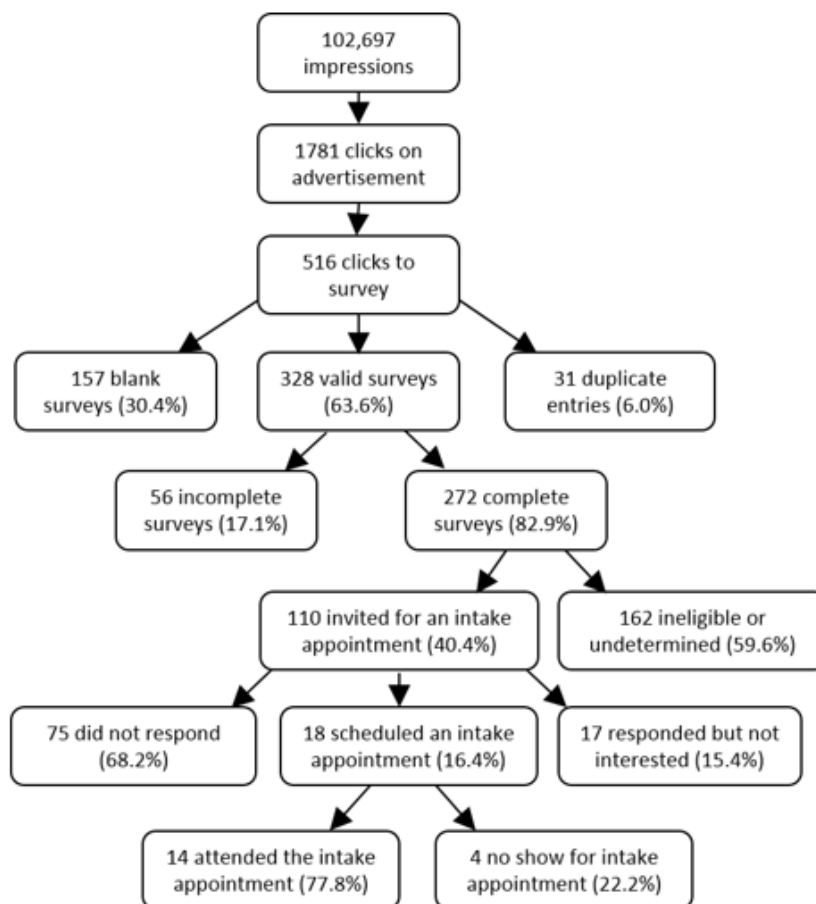
## Results

### Recruitment Results

Recruitment results are depicted in Figure 2. In total, 3 Facebook advertisements generated 102,697 impressions (ie, number of times the advertisement was displayed), 1781 clicks on the advertisement, and 516 surveys in 2 months, at an overall cost of \$480.89. Facebook estimated we had a daily reach (ie, number of people who saw the advertisement) of 3400-9100 out of 890,000 (the total number of people in our selected audience who were active on Facebook each day). The majority of people viewed and clicked on our advertisements from mobile devices (1662/1781, 93%, vs 113/1781, 6% on tablets and 6/1781, <1%

on desktops). Of the 3 advertisements, advertisement A (Figure 1) generated the most interest and clicks to the survey page (1393/1781, 78.2% of clicks). A total of 328 valid Web-based surveys were analyzed after removing blank (n=157) and duplicate (n=31) entries. Of the 328 surveys, 55 (16.8%) answered only initial questions related to demographics and interest in changing smoking or drinking behavior. Completed surveys were reviewed, resulting in 110 participants who met preliminary screening criteria. Research staff contacted all 110 participants to let them know more about the study and invite them to complete an intake and further evaluation for a treatment research study. Of those, 18 were interested in the treatment study and scheduled an intake appointment. Most participants who scheduled an intake (14/18) attended this appointment. Overall, Facebook advertising was highly cost-effective, averaging \$0.27 per click, \$1.76 per completed survey, \$4.37 per participant eligible for an intake, and \$34.35 per participant who completed the in-person intake.

Figure 2. Flow diagram showing response rates to Facebook advertisements.



### Participant Characteristics

Descriptive statistics were used to characterize participant demographics and responses to survey items. On average, survey responders were 37.4 (SD 10.8) years old, and 63.4% (208/328) were female. Independent sample *t* tests and chi-square analyses were used to assess differences in demographic characteristics

by survey completer status (Table 1). Age ( $t_{325}=-1.86, P=.06$ ), desire to reduce cigarette use ( $\chi^2_{[2,N=328]}=0.6, P=.73$ ), and desire to reduce alcohol use ( $\chi^2_{[2,N=328]}=2.3, P=.32$ ) did not differ significantly by completion status. Significantly more females completed the survey (179/272, 65.8%) than males (93/272, 34.2%;  $\chi^2_{[1,N=328]}=3.9, P=.04$ ).

**Table 1.** Demographic characteristics by survey completion status.

Demographic characteristics	Incomplete survey (N=56)	Complete survey (N=272)
Age in years, mean (SD)	39.8 (12.2)	36.8 (10.4)
Sex, female, n (%)	29 (51.8)	179 (65.8)
<b>Desire to reduce cigarette use, n (%)</b>		
Immediately	53 (94.6)	254 (93.4)
At a later date	3 (5.4)	15 (5.5)
No response	0 (0.0)	3 (1.1)
<b>Desire to reduce alcohol use, n (%)</b>		
Yes	15 (26.8)	56 (20.6)
Maybe at a later date	9 (16.1)	32 (11.8)
No	32 (57.1)	184 (67.6)

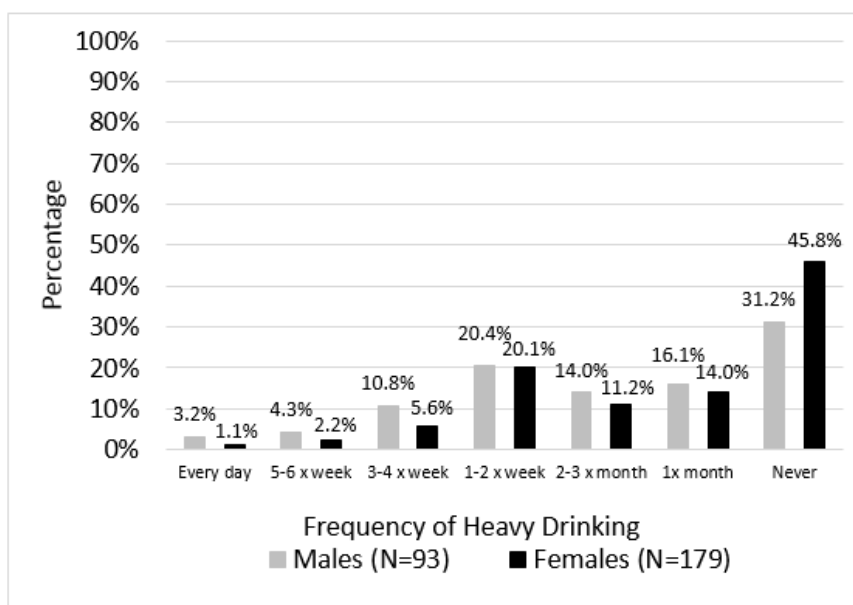
### Smoking and Alcohol Use

The remaining analyses characterized responses from the 272 completed surveys. The advertisement was successful in reaching smokers interested in treatment. All survey respondents (n=272) reported daily smoking and the majority stated an interest in immediately reducing their cigarette use. Subjects reported smoking 16.2 cigarettes (SD 7.0) per day on average. Additionally, many of the smokers who responded also regularly used alcohol. More than 59% (161/272) reported heavy alcohol consumption at least once a month, measured according to NIAAA guidelines as ≥ 5 standard drinks/men, ≥ 4 standard drinks/women [24]. Figure 3 shows the frequency of heavy drinking reported by men and women in the sample. More than

19% (54/272) of respondents indicated they that experienced at least one alcohol withdrawal symptom in the past.

Although most respondents did not wish to reduce their alcohol use at the time of completing the survey, almost one-third were interested in making changes now or in the future. Chi-square analyses were used to examine whether treatment interest differed between those who reported heavy drinking at least once a month and those who reported never experiencing heavy drinking. The majority of smokers also interested in reducing their alcohol use now were heavy drinkers (45/56, 80.4%) compared to non-heavy drinkers (11/56, 19.6%;  $\chi^2_{[1,N=272]}=13.0, P<.001$ ).

**Figure 3.** Frequency of heavy alcohol use by sex.



### Medical and Psychiatric History

Participants responded to questions about current medical and psychiatric problems to assess initial eligibility. Overall, 1.5% (4/272) were currently pregnant or nursing, 22.1% (60/272) reported currently being treated for a medical problem, 17.3% (47/272) reported a history of treatment for psychiatric problems,

31.6% (86/272) reported currently taking medications or prescription drugs, and less than 5% (13/272) selected that they preferred not to answer these questions.

## Discussion

This study evaluated the utility of Facebook advertising to recruit smokers and heavy-drinking smokers for treatment. Using 3 advertisements over 2 months, we were able to target adults interested in smoking cessation treatment, many of whom also drank heavily and were interested in changing their alcohol use as well. The majority of clicks on the survey from our advertisements resulted in valid, completed survey responses. Furthermore, the obtained information allowed for a cost-effective way of conducting initial eligibility screening, although additional efforts may be needed to engage individuals into treatment after completion of Web-based screening surveys.

Overall, Facebook was effective for reaching adult smokers and heavy-drinking smokers. However, only 12.7% of those who were initially eligible based on survey responses attended an in-person intake meeting for treatment research. The average cost per valid completed survey was comparable to costs from social media advertising reported by Ramo and colleagues [16]. Although the cost per participant completing the intake appointment was higher (\$34), this was comparable or cheaper than other investigations using Web-based social media to recruit for smoking studies (\$30-\$170) [25-28], and was less expensive than traditional recruitment costs (eg, direct mailing or print journalism) reported in other studies (\$50-\$600) [26,29,30]. Only a small proportion started but did not complete the survey. We successfully obtained responses about tobacco and alcohol use for the majority of respondents who initiated the survey, suggesting Web-based surveys may be especially useful for quickly obtaining a range of information from target audiences, including information on potentially stigmatized behavior such as substance use. Additionally, elements of online communication such as convenience, familiarity, or anonymity may contribute to individuals' greater willingness to complete Web-based surveys compared with face-to-face meetings. Although this may reduce the rate of in-person follow-up from Web-based advertising and potentially limit the utility for recruiting smokers into traditional treatment in practice, it is also possible that Web-based advertising reaches individuals who would not otherwise present for treatment. Identifying more effective ways to encourage in-person follow-up or capitalize on online convenience will be important for treatment dissemination.

In particular, reaching heavy-drinking smokers through smoking cessation treatment may provide unique opportunities for motivational enhancement interventions for those who are not currently interested in treatment for their alcohol use. Although most survey respondents were interested in changing their

smoking behavior, fewer were interested in changing their alcohol use. However, our results suggest there is a subset of smokers who are interested in changing both tobacco and alcohol use behaviors at the same time. These findings are consistent with prior work [31,32] and support the idea of integrating smoking cessation services into treatment for co-occurring substance use [33-36].

This study has several limitations that should be considered. First, we are unable to determine the representativeness of the sample recruited through Facebook. Data generated by Facebook do not allow us to assess how our sample of respondents compares with the general population of Facebook users meeting our target criteria. Additionally, our sample is from a limited geographic region given our interest in using Web-based recruitment to generate participants for an in-person treatment study. We only collected demographic information related to sex and age, thus we are limited in our ability to determine how representative this sample was of our geographic region or how these results may compare with other regions. However, the average age and cigarettes per day of our sample were similar to other studies using Internet-based recruitment for adult smokers [25,37], supporting the generalizability of these findings. Furthermore, our 3 advertisements were viewed an unequal number of times as designed by the Facebook algorithm (ie, more popular advertisements were shown more often), and without systematically varying the advertisement content and presentation of images, it is difficult to determine which elements of advertisement A were most appealing. It is possible that something about the advertisement itself resonated more with the audience, although additional work is needed to determine the most effective social media advertising image. Lastly, we are limited by the self-report nature of the assessments, and survey results may be influenced by reporting bias. We are unable to determine the reason for incomplete survey responses. Researchers should carefully consider participant factors or other technological factors that may affect Web-based survey completion.

Despite these limitations, our results suggest Facebook advertisements were successful in reaching adult smokers interested in treatment research. Additionally, general recruitment for smokers reached those who also drink alcohol heavily, which may provide an opportunity to engage heavy drinkers into treatment. Given the widespread use of social media and the ease of connecting to users on the go through mobile devices, Web-based advertising for survey or intervention research may be an important strategy to engage at-risk and hard-to-reach populations.

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## Conflicts of Interest

Stephanie S O'Malley is a member of the American Society of Clinical Psychopharmacology's Alcohol Clinical Trials Initiative, supported with funding from Abbott Laboratories, Alkermes, Eli Lilly, Lundbeck, Pfizer, and Ethypharma; consultant/advisory board member, Alkermes; contract as a site for a multisite study, Eli Lilly; medication supplies, Pfizer; Scientific Panel Member, Hazelden Betty Ford Foundation. All other authors report no conflicts of interest.

## References

- Centers for Disease Control and Prevention (CDC). Smoking-attributable mortality, years of potential life lost, and productivity losses--United States, 2000-2004. *MMWR Morb Mortal Wkly Rep* 2008 Nov 14;57(45):1226-1228 [FREE Full text] [Medline: [19008791](#)]
- U.S. Department of Health and Human Services. The health consequences of smoking: 50 years of progress. A report of the surgeon general. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2014.
- Centers for Disease Control and Prevention (CDC). Quitting smoking among adults--United States, 2001-2010. *MMWR Morb Mortal Wkly Rep* 2011 Nov 11;60(44):1513-1519 [FREE Full text] [Medline: [22071589](#)]
- Cook JW, Fucito LM, Piasecki TM, Piper ME, Schlam TR, Berg KM, et al. Relations of alcohol consumption with smoking cessation milestones and tobacco dependence. *J Consult Clin Psychol* 2012 Dec;80(6):1075-1085 [FREE Full text] [doi: [10.1037/a0029931](#)] [Medline: [22963593](#)]
- Dawson DA. Drinking as a risk factor for sustained smoking. *Drug Alcohol Depend* 2000 Jun 1;59(3):235-249. [Medline: [10812284](#)]
- Osler M, Prescott E, Godtfredsen N, Hein HO, Schnohr P. Gender and determinants of smoking cessation: a longitudinal study. *Prev Med* 1999 Jul;29(1):57-62. [doi: [10.1006/pmed.1999.0510](#)] [Medline: [10419801](#)]
- Zimmerman RS, Warheit GJ, Ulbrich PM, Auth JB. The relationship between alcohol use and attempts and success at smoking cessation. *Addict Behav* 1990;15(3):197-207. [Medline: [2378280](#)]
- Kuper H, Tzonou A, Kaklamani E, Hsieh CC, Laggiou P, Adami HO, et al. Tobacco smoking, alcohol consumption and their interaction in the causation of hepatocellular carcinoma. *Int J Cancer* 2000 Feb 15;85(4):498-502 [FREE Full text] [Medline: [10699921](#)]
- Lowenfels AB, Maisonneuve P, Cavallini G, Ammann RW, Lankisch PG, Andersen JR, et al. Prognosis of chronic pancreatitis: an international multicenter study. International Pancreatitis Study Group. *Am J Gastroenterol* 1994 Sep;89(9):1467-1471. [Medline: [8079921](#)]
- Vaillant GE, Schnurr PP, Baron JA, Gerber PD. A prospective study of the effects of cigarette smoking and alcohol abuse on mortality. *J Gen Intern Med* 1991;6(4):299-304. [Medline: [1890499](#)]
- Znaor A, Brennan P, Gajalakshmi V, Mathew A, Shanta V, Varghese C, et al. Independent and combined effects of tobacco smoking, chewing and alcohol drinking on the risk of oral, pharyngeal and esophageal cancers in Indian men. *Int J Cancer* 2003 Jul 10;105(5):681-686 [FREE Full text] [doi: [10.1002/ijc.11114](#)] [Medline: [12740918](#)]
- Falk DE, Yi HY, Hiller-Sturmhöfel S. An epidemiologic analysis of co-occurring alcohol and tobacco use and disorders: findings from the National Epidemiologic Survey on Alcohol and Related Conditions. *Alcohol Res Health* 2006;29(3):162-171. [Medline: [17373404](#)]
- Substance Abuse and Mental Health Services Administration. Results from the 2013 National Survey on Drug Use and Health: Summary of National Findings. Rockville, MD: NSDUH Series H-48, HHS Publication No. (SMA). Substance Abuse and Mental Health Services Administration; 2014:14-4863.
- Witkiewitz K, Dearing RL, Maisto SA. Alcohol use trajectories among non-treatment-seeking heavy drinkers. *J Stud Alcohol Drugs* 2014 May;75(3):415-422 [FREE Full text] [Medline: [24766753](#)]
- McKee SA, Falba T, O'Malley SS, Sindelar J, O'Connor PG. Smoking status as a clinical indicator for alcohol misuse in US adults. *Arch Intern Med* 2007 Apr 9;167(7):716-721 [FREE Full text] [doi: [10.1001/archinte.167.7.716](#)] [Medline: [17420431](#)]
- Ramo DE, Hall SM, Prochaska JJ. Reaching young adult smokers through the internet: comparison of three recruitment mechanisms. *Nicotine Tob Res* 2010 Jul;12(7):768-775 [FREE Full text] [doi: [10.1093/ntr/ntq086](#)] [Medline: [20530194](#)]
- Thornton LK, Harris K, Baker A, Johnson M, Kay-Lambkin FJ. Recruiting for addiction research via Facebook. *Drug Alcohol Rev* 2015 Jul 14;Epub ahead of print:1-9. [doi: [10.1111/dar.12305](#)] [Medline: [26179224](#)]
- Ramo DE, Prochaska JJ. Broad reach and targeted recruitment using Facebook for an online survey of young adult substance use. *J Med Internet Res* 2012;14(1):e28 [FREE Full text] [doi: [10.2196/jmir.1878](#)] [Medline: [22360969](#)]
- Pedersen ER, Helmuth ED, Marshall GN, Schell TL, PunKay M, Kurz J. Using facebook to recruit young adult veterans: online mental health research. *JMIR Res Protoc* 2015;4(2):e63 [FREE Full text] [doi: [10.2196/resprot.3996](#)] [Medline: [26033209](#)]
- Carlini BH, Safioti L, Rue TC, Miles L. Using Internet to recruit immigrants with language and culture barriers for tobacco and alcohol use screening: a study among Brazilians. *J Immigr Minor Health* 2015 Apr;17(2):553-560. [doi: [10.1007/s10903-013-9934-1](#)] [Medline: [24563138](#)]

21. Graham AL, Fang Y, Moreno JL, Streiff SL, Villegas J, Muñoz RF, et al. Online advertising to reach and recruit Latino smokers to an internet cessation program: impact and costs. *J Med Internet Res* 2012;14(4):e116 [FREE Full text] [doi: [10.2196/jmir.2162](https://doi.org/10.2196/jmir.2162)] [Medline: [22954502](https://pubmed.ncbi.nlm.nih.gov/22954502/)]
22. Chou WS, Hunt YM, Beckjord EB, Moser RP, Hesse BW. Social media use in the United States: implications for health communication. *J Med Internet Res* 2009;11(4):e48 [FREE Full text] [doi: [10.2196/jmir.1249](https://doi.org/10.2196/jmir.1249)] [Medline: [19945947](https://pubmed.ncbi.nlm.nih.gov/19945947/)]
23. Facebook. Advertiser help center: scheduling and delivery. 2016. URL: <https://www.facebook.com/business/help/430291176997542> [accessed 2016-01-22] [WebCite Cache ID 6h2FkW82n]
24. NIAAA. NIAAA Council Task Force. 2003. Recommended alcohol questions URL: <http://www.niaaa.nih.gov/research/guidelines-and-resources/recommended-alcohol-questions> [accessed 2015-11-16] [WebCite Cache ID 6d5XHutJJ]
25. Frandsen M, Walters J, Ferguson SG. Exploring the viability of using online social media advertising as a recruitment method for smoking cessation clinical trials. *Nicotine Tob Res* 2014 Feb;16(2):247-251. [doi: [10.1093/ntr/ntt157](https://doi.org/10.1093/ntr/ntt157)] [Medline: [24127266](https://pubmed.ncbi.nlm.nih.gov/24127266/)]
26. Rait MA, Prochaska JJ, Rubinstein ML. Recruitment of adolescents for a smoking study: use of traditional strategies and social media. *Transl Behav Med* 2015 Sep;5(3):254-259 [FREE Full text] [doi: [10.1007/s13142-015-0312-5](https://doi.org/10.1007/s13142-015-0312-5)] [Medline: [26327930](https://pubmed.ncbi.nlm.nih.gov/26327930/)]
27. Ramo D, Rodriguez T, Chavez K, Sommer M, Prochaska J. Facebook recruitment of young adult smokers for a cessation trial: Methods, metrics, and lessons learned. *Internet Interventions* 2014 Apr;1(2):58-64.
28. Heffner JL, Wyszynski CM, Comstock B, Mercer LD, Bricker J. Overcoming recruitment challenges of web-based interventions for tobacco use: the case of web-based acceptance and commitment therapy for smoking cessation. *Addict Behav* 2013 Oct;38(10):2473-2476 [FREE Full text] [doi: [10.1016/j.addbeh.2013.05.004](https://doi.org/10.1016/j.addbeh.2013.05.004)] [Medline: [23770645](https://pubmed.ncbi.nlm.nih.gov/23770645/)]
29. Gordon J, Akers L, Severson H, Danaher B, Boles S. Successful participant recruitment strategies for an online smokeless tobacco cessation program. *Nicotine Tob Res* 2006 Dec;8(Suppl 1):S35-S41.
30. Boyle RG, Enstad C, Asche SE, Thoele MJ, Sherwood NE. Evaluating strategies and costs to recruit smokeless tobacco users. *Addict Behav* 2007 Dec;32(12):3088-3092. [doi: [10.1016/j.addbeh.2007.06.005](https://doi.org/10.1016/j.addbeh.2007.06.005)] [Medline: [17602843](https://pubmed.ncbi.nlm.nih.gov/17602843/)]
31. Fucito LM, Hanrahan TH. Heavy-drinking smokers' treatment needs and preferences: A mixed-methods study. *J Subst Abuse Treat* 2015 Dec;59:38-44. [doi: [10.1016/j.jsat.2015.07.001](https://doi.org/10.1016/j.jsat.2015.07.001)] [Medline: [26297324](https://pubmed.ncbi.nlm.nih.gov/26297324/)]
32. Gulliver SB, Kamholz BW, Helstrom AW. Smoking cessation and alcohol abstinence: what do the data tell us? *Alcohol Res Health* 2006;29(3):208-212. [Medline: [17373411](https://pubmed.ncbi.nlm.nih.gov/17373411/)]
33. Cooney NL, Litt MD, Sevarino KA, Levy L, Kranitz LS, Sackler H, et al. Concurrent alcohol and tobacco treatment: Effect on daily process measures of alcohol relapse risk. *J Consult Clin Psychol* 2015 Apr;83(2):346-358. [doi: [10.1037/a0038633](https://doi.org/10.1037/a0038633)] [Medline: [25622198](https://pubmed.ncbi.nlm.nih.gov/25622198/)]
34. Fiore M, Jaen C, Baker T, Bailey W, Benowitz N, Curry S. Treating tobacco use and dependence: 2008 update. *Clinical Practice Guideline*. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service; 2008.
35. Hall SM, Prochaska JJ. Treatment of smokers with co-occurring disorders: emphasis on integration in mental health and addiction treatment settings. *Annu Rev Clin Psychol* 2009;5:409-431 [FREE Full text] [doi: [10.1146/annurev.clinpsy.032408.153614](https://doi.org/10.1146/annurev.clinpsy.032408.153614)] [Medline: [19327035](https://pubmed.ncbi.nlm.nih.gov/19327035/)]
36. Prochaska JJ, Delucchi K, Hall SM. A meta-analysis of smoking cessation interventions with individuals in substance abuse treatment or recovery. *J Consult Clin Psychol* 2004 Dec;72(6):1144-1156. [doi: [10.1037/0022-006X.72.6.1144](https://doi.org/10.1037/0022-006X.72.6.1144)] [Medline: [15612860](https://pubmed.ncbi.nlm.nih.gov/15612860/)]
37. Puckett M, Neri A, Thompson T, Underwood JM, Momin B, Kahende J, Centers for Disease Control and Prevention (CDC). Tobacco cessation among users of telephone and web-based interventions--four states, 2011-2012. *MMWR Morb Mortal Wkly Rep* 2015 Jan 2;63(51):1217-1221 [FREE Full text] [Medline: [25551593](https://pubmed.ncbi.nlm.nih.gov/25551593/)]

## Abbreviations

**NIAAA:** National Institute on Alcohol Abuse and Alcoholism

**FDA:** Food and Drug Administration

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