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Recruitment of Adolescents for a Smoking Study: Use of Traditional Strategies and Social Media

ABSTRACT

Background: Engaging and retaining adolescents in research studies is challenging. Social media offers utility for expanding the sphere of research recruitment.

Purpose: This study examined and compared traditional and Facebook-based recruitment strategies on reach, enrollment, cost, and retention.

Methods: 13-17 year old substance users were recruited through several methods, including social media, a study website, fliers, talks in schools, bus ads, and referrals. Study involvement included a one-time visit and semi-annual follow-up surveys.

Results: 1,265 individuals contacted study personnel; 629 were ineligible; 129 declined; and 200 participants enrolled. Facebook drew the greatest volume but had a high rate of ineligibles. Referrals were the most successful and cost-effective (\$7 per enrolled participant); school talks were the least. Recruitment source was unrelated to retention success.

Conclusion: Facebook may expand recruitment reach, but had greater financial costs and more ineligible contacts, resulting in fewer enrollees relative to traditional interpersonal recruitment methods. Referrals, though useful for study engagement, did not provide a differential benefit in terms of long-term retention.

INTRODUCTION

Recruitment and retention present key challenges to research, challenges which can be amplified when adolescents are involved (Moolchan, & Mermelstein, 2002; Spigarelli, 2008). Adolescents can be difficult to engage in the research process since parental consent is often required for youth under 18 (Chartier, et al., 2008; McCormick, et al., 1999). This can be even more challenging when, as is the case with this study, the study involves sensitive issues such as substance use (McCormick, et al., 1999; Rojas, Sherritt, Harris, & Knight, 2008). Adolescents also present unique challenges for tracking and retention, changing their emails and cell phone numbers and, as they transition to young adulthood changing their addresses multiple times as they move off to college or their own homes.

Much has been written about traditional recruitment methods including specific methods of collaboration with schools and community sources (Hartlieb, et al., 2015; Lamb, Puskar, & Tusaie-Mumford, 2001; McCormick, et al., 1999; Nguyen, McGregor, & O'Connor, 2012). These recruitment methods often incorporate reaching out to youth through schools and community centers, which can be costly in terms of personnel and resources (Robinson, et al., 2007) and may yield low enrollment rates (Morton, Cahill, & Hartge, 2006). School-based recruitment often means working with district-level administration for extended periods of time to gain access to a finite number of students (Lamb, et al., 2001). Additional complications arising from school-based recruitment include class schedules, holidays, and student absenteeism (Lamb, et al., 2001). Paper-based recruitment, such as printing and posting fliers in health clinics, can be time consuming to implement and maintain (Robinson, et al., 2007) and can yield low recruitment rates (Close, et al., 2013). As with school-based recruitment, permission to

advertise in clinics and community facilities can require navigation of complex administrative networks. Additionally, there is no guarantee the advertisements will remain posted in community areas. Mass mailings are often expensive and do not always reach the intended target audience. Given these concerns and with the growth in use and access to technology, research studies are turning toward web-based recruitment methods, particularly among studies recruiting youth and young adult populations (e.g. Ahmed, et al., 2013; Close, et al., 2013; Fenner, et al., 2012; Jones, Saksvig, Grieser, & Young, 2012; Logsdon, et al., 2015).

According to Pew research (<http://www.pewinternet.org/fact-sheets/teens-fact-sheet/>), as of 2012 95% of teens residing in the United States have Internet access (Pew Research Center, 2014a) and 93% have access to a computer in their households (Pew Research Center, 2014b).

Additionally three out of four teens have access to the internet through a mobile device (Pew Research Center, 2014b). After Google, Facebook is the second most popular website in the country and the largest social networking site (Alexa, 2013). Among all US teens ages 12 to 17, 73% use Facebook (<http://www.pewresearch.org/fact-tank/2014/02/03/6-new-facts-about-facebook/>). Of social media using teens, 94% have a Facebook profile, and 81% state Facebook is the profile they use most often (<http://www.pewinternet.org/2013/08/15/teens-havent-abandoned-facebook-yet/>). Hence, Facebook could be an ideal medium for recruiting an adolescent study sample. In addition, Facebook offers the ability to target advertising to users of interest based on geography, gender, age and even specific interests (i.e., smoking).

Most studies using Facebook are recruiting exclusively for online studies, with a handful using Facebook to recruit participants into traditional studies that include a site visit (e.g. Ahmed, et al.,

2013; Close, et al., 2013). Although the use of Facebook for recruitment purposes is on the rise, there are limited reports of the success of this method of recruitment for studies of adolescents. Two recent systematic reviews examining the use of Facebook as a recruitment tool in adolescent health research found that Facebook has the potential to reach a wide audience (Amon, Campbell, Hawke, & Steinbeck, 2014 and Park & Calamaro, 2013). However, neither review described specific cost savings or comparative benefits over traditional methods.

To date, most research reporting on Facebook-based recruitment efforts with adolescents or young adults has been with online surveys and internet interventions (Fenner, et al., 2012; Graham, et al., 2012; Ramo & Prochaska, 2012). That is, participants are recruited online and immediately connected with an online survey or intervention. To our knowledge, the use and comparative success and cost of technology-based and traditional recruitment methods in community or clinic-based research with adolescents has not been examined. Within a longitudinal trial of adolescent tobacco use, the current study sought to examine and compare several traditional and Facebook-based recruitment strategies on reach, enrollment, cost, and retention. We hypothesized that Facebook would yield the greatest volume of potential interest in the study, but that referrals would be more targeted and link to a greater proportion of study-eligible youth and be associated with better retention over time due to providing a more personalized initial connection.

METHODS

Sample

Adolescents, aged 13-17, were recruited between December 2009 and June 2012 for a longitudinal study examining the influence of metabolism on the development of nicotine addiction in adolescence. Interested individuals contacted the study via phone, e-mail, text messaging, the study's website, or Facebook and were screened by study staff for inclusion and exclusion criteria. Eligibility criteria were English fluency, smoking 1 to 5 cigarettes a day, residing in the San Francisco Bay Area, and access to transportation to the study site. Written informed assent from the adolescent and consent from one parent was required for participation.

Informed Consent

The research design and procedures were reviewed and approved by the University of California Institutional Review Board. Informed, written assent from the adolescent subject and consent from one parent were obtained for each subject before data collection.

Procedures

A full description of the procedures employed in the parent study has been published previously (Rubinstein et al., 2012). In brief, study involvement entailed attendance at a one-time 9-hour outpatient hospital visit with follow-up surveys every six months over three years. The current analyses include data through follow-up month 24, which closed in June 2014; retention rates have not changed appreciably over the course of the study. With a goal of N=200, a combination of recruitment strategies was employed.

Recruitment Methods

Traditional Recruitment

Municipal bus advertising: Advertisements were professionally designed and placed on the tails and interiors of San Francisco MUNI bus lines with study contact information. The advertising campaign was for a three-month period between the beginning of September and the end of November. Bus routes with a high density of middle and high schools on their routes were specifically targeted for this advertising campaign. The costs were \$2,550.

Fliers: Information sheets in the form of fliers using the identical graphics and wording from the bus ad and with tear off contact information or postcards were posted locally at school health clinics, YMCA clubhouses, San Francisco Recreation and Parks bulletin boards, public libraries, and in health clinics and doctor offices. The tear sheets provided the study phone number and web address (see Website description below). The costs were \$150 for printing. Volunteers were used to post fliers.

School Talks: Study staff delivered 12 health education talks at middle and high schools in the San Francisco Bay Area and distributed a study information sheet with contact details (text, telephone, email, website) at the conclusion. The costs were approximately \$3,359 based on study staff time and travel (60-minute presentation and 60 minutes for two-way travel per presentation).

Previous Studies: Participants from previous studies who had given permission to be re-contacted, were contacted by staff to determine interest and eligibility for the current project.

Referrals: Word of mouth or snowball recruitment was used with IRB approval. If a study participant referred someone to the study and that person came in and completed the baseline visit, the person making the referral received a movie pass. The costs were \$7 per movie pass. We also encouraged referrals from participants from previous studies, even if not eligible themselves.

Web-based Recruitment

Facebook: In an effort to broaden our catchment population, we attempted to utilize MySpace and Facebook for recruitment, the two most popular social media destinations for adolescents at the time of study start. However, MySpace had a policy barring advertising pertaining to tobacco, including federally-funded, university-based studies. Consequently, we chose to focus our online advertising only on Facebook. The ads used identical graphics and wording as on the bus and fliers and specifically targeted all Facebook using teens aged 13-17 years who lived within 25 miles of San Francisco, resulting in an estimated pool of 80,000 people. We also limited the ads to those who specifically reported “smoking” as an interest. If interested, teens were able to click through the ad to the study website, where they could learn more about the study including the eligibility criteria and submit their contact information to the study team. The Facebook advertising campaign took place over a period of 30 months. In that time period, a

total of 44,972,342 impressions were placed on Facebook pages, with 11,299 clicks on the ad recorded. The costs per impression and per click varied over time, with a total cost of \$6,734.

Website: A study website was created describing the study (i.e., criteria for participation, purpose, procedures at each visit). The site included basic information on the research team and allowed potential participants to submit their contact information. The website also provided information on local smoking cessation programs available to adolescents.

Measurement

Individuals contacting the study website were asked in an online intake form to identify the recruitment methods that led to their engagement. Possible responses were (a) referral from a friend or family member, (b) seeing a flier, (c) attending a talk at school, (d) responding a Facebook ad, or (e) other. Only one participant reported more than one recruitment method, and in this case, the first method indicated on the form was the method assigned to that participant. Because recruitment method was not a mandatory item on our screening form, some participants declined to state how they heard about the study; these individuals were coded as “unknown.” Retention was monitored as completion of study activities at the 6, 12, 18, and 24-month follow-ups.

Analyses

Recruitment methods were analyzed for their success rate in terms of (i) count of individuals contacting the study; (ii) count of individuals enrolling in the study; and (iii) percent of

participants recruited via each method who were retained at each of the study follow-ups. Reasons for non-enrollment were examined by recruitment strategy. Finally, recruitment methods were analyzed for cost effectiveness calculated as time and financial cost per enrolled study participant.

RESULTS

Reach and Enrollment

A total of 1,265 individuals contacted the study, of whom, 961 were screened (304 were not reachable at callback). Of those screened, 629 (65%) were determined to be ineligible for participation based on study inclusion/exclusion criteria, and an additional 9 were ruled out for other extenuating circumstances (e.g., planning to move out of the country). Of the 329 participants who were study eligible, 51 were unable to obtain parent permission, 87 decided they were not interested, and 200 participants enrolled in the study.

Facebook provided the greatest number of people contacting the study (N=557, 44%) and completing the screening process (N=405, 42%), while referrals provided the greatest number of participants enrolling into the study: 104 (52%) of the 200 enrolled participants reported they were referred to the study by another person. Facebook had the second highest number of enrollees, with 45 (23%). The remaining methods -- school talks, bus advertisements, fliers, and other methods -- contributed 25% together. Table 1 presents the percentage of people who initially contacted, were screened, and enrolled in the study overall and by recruitment strategy.

Reasons for non-enrollment were examined by recruitment strategy. For traditional recruitment methods, the most common reasons for ineligibility were non-smoking status (school-talks, fliers, bus ads, referrals), being too old (fliers, bus ads, referrals), and smoking too much (fliers). For Facebook, non-smoking status was again the most common reason, accounting for 200 exclusions (49%).

Recruitment Cost

Interpersonal referrals were the most cost effective recruitment method when looking at cost per person screened as well as cost per person enrolled, while school talks were the least cost effective (Table 2).

Retention

To assess group differences, retention rates were calculated at 6, 12, 18, and 24-months follow-up. Because the number of participants recruited via fliers, school talks, bus ads and other groups was small, we combined them into one group. Using an ANOVA to compare the resulting three groups (Facebook, referrals, and all other methods) we found no difference in retention at any of the time points (p 's ranged from 0.07 to 0.23) (Figure 1).

DISCUSSION

Social media presents a growing channel with potential utility for participant recruitment for research, particularly among adolescents and young adults. However, despite the advantages of

Facebook with regard to reach and convenience (i.e., point and click recruitment), the most successful and cost-effective enrollment strategy in the current study was referrals. Though the total number of people contacting the study through referrals was only about half the number that contacted the study through Facebook, 40% of those referred went on to join the study, compared with only 8% of Facebook contacts.

Though our print and media advertisements were all targeted towards smokers, the most common reason for ineligibility, across recruitment methods, was non-smoking status. While we cannot be certain as to the reason so many non-smokers contacted us, a number of the teens who classified themselves as “smokers” on Facebook, reported that they smoked marijuana and not tobacco. Being too old was common among individuals recruited via bus ads, fliers, and referrals, but not with social media. This highlights another advantage of Facebook, which allowed us to target our advertising campaign to the age-range of interest so that older smokers would not have seen our ads.

Some studies have found that while start-up can be time and labor intensive, using a school based recruitment method results in overall lower costs and increased retention over the course of the study (Jaycox, et al., 2006; Rodrigo, Sinclair, Cunliffe, & Leder, 2009). However, the current study did not produce similar results, as school talks were not as economical as the other methodologies and did not yield many enrollees. Similar findings have been seen in other studies examining adolescent nicotine users (McCormick, et al., 1999).

Interpersonal referrals were by far the most cost effective way to recruit participants into the study, with the per capita cost of enrollment only 5% of the cost of enrollment through Facebook.

The greatest limitation is that the method is dependent on building a base of participants who can provide referrals; hence, a referral-based recruitment system is not practical on its own, but appears to be an inexpensive and successful means of increasing enrollment once a small base of participants has been established. Though not tested here, referrals and social media can be combined, as used for a recent web-based cessation study (Sadasivam, et al., 2013). A similar strategy may be successful for face-to-face research activities as well.

We expected interpersonal referrals to have the highest retention rate because this group was recruited by participants already enrolled in the study, which provided an additional means of contact for the participants, as well as understanding of what the study would be about before enrolling. Furthermore, we predicted that Facebook users might have lower retention rates because there was no personal investment in the study, rather they found out about it by clicking on an ad on their computer. Surprisingly, we found no difference in retention rates between Facebook and referrals.

A study limitation was the relatively large number of people who contacted the study from an unknown recruitment method. Because recruitment method data were largely collected via an initial online contact sheet, prior to screening participants for eligibility, the data collected were self-reported and the question did not require an answer to complete the form. Importantly, none of the people in this group enrolled in the study, but it would be beneficial to know if this group was more likely to stem from one recruitment method versus another. Another limitation was the inability to look at data on the racial or specific age breakdown of the Facebook impressions. As such, we are unable to evaluate the possibility that Facebook ads may be more appealing or

successful for recruiting certain racial groups or specific ages within the pre-set 13-17 year range. We were able to look at gender and found no gender differences in Facebook click through rates (CTR). Both groups had a CTR of 0.01%.

It is also worth noting that there are other social media sites that could be utilized for recruiting study participants such as Twitter. However, at the time when this study was undertaken, only 8% of internet users aged 12-17 used Twitter and thus was not a high value avenue for recruitment ([Lenhart](#), Purcell, Smith, & Zickuhr, 2010). Still another possible avenue is the use of data mining algorithms and machine learning for the recruitment of participants on social media sites (Hamed, Wu, & Rubin, 2014). Larger studies need to be undertaken to compare the relative effectiveness of various social media and web and/or mobile approaches for recruiting with consideration of racial, age, and gender groups of interest.

In conclusion, technology-based recruitment such as Facebook can offer an innovative way to expand the reach and provide more focused targeting of potential participants without obvious effects on retention. However, such a strategy may come at a financial cost with more expense and less effectiveness at generating actual enrollees compared with the success rates of interpersonal referrals. In the current study, interpersonal referrals were the more successful way to recruit adolescents for a study of their tobacco use.

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Conflict of Interest statement

The authors declare that there are no conflicts of interest.

Adherence to Ethical Principles

All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from all patients for being included in the study.

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