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Using Facebook for health-related research study recruitment and program delivery

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Facebook has become an important tool for recruiting research participants and for program delivery. Given the wide use of Facebook, there is much potential for the site to help with recruitment efforts in both physical and behavioral health care arenas; reaching groups typically difficult to recruit and providing outreach to individuals that may not have received services elsewhere. Health studies using Facebook have generally reported success, including cost-effectiveness, recruitment of samples in brief periods of time, and ability to locate participants for follow-up research. Still, the use of Facebook for research and program delivery is a relatively new area that warrants more research attention and guidance around issues like validity of data, representativeness of samples, and protections of human subjects.

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Facebook, a popular social media website that was founded in 2004, is the second most visited website in the world today [1], with 1.44 billion monthly users globally and over 161 million daily active users from North American [2]. The website is used by upwards of three-quarters of online adolescents and adults [3,4] to share pictures and status posts with friends and family, follow content of interest (e.g. organizations, commercial products, news outlets), and stay apprised of current events and popular trends. Given the popularity and reach of Facebook in the population, Facebook represents an important tool to reach individuals for programmatic efforts that may not have sought services otherwise. With paid advertisement space available, it also represents an important, novel mechanism for recruiting participants into research studies. In this review, we discuss the studies that have used Facebook for recruitment and programmatic efforts in areas of physical and behavioral

health. Based on this review, we also offer recommendations for using Facebook for these efforts.

Physical health research and program delivery

For physical health, Facebook has primarily been used for research and program delivery in areas of female sexual, reproductive, and physical health, such as to promote screening for medical concerns like breast cancer and sexually transmitted infections (STIs) and to assess physical activity and nutrition among adolescent girls [5*,6*,7*,8*,9*,10*,11*,12*,13*,14*,15*]. There are few physical health studies outside of female health that have utilized Facebook for recruitment. Notably, however; researchers used Facebook to recruit boys with the genetic condition Klinefelter syndrome, after traditional recruitment mechanisms were unsuccessful [16*]. Facebook campaigns have also been used successfully to track regional estimates of human papillomavirus vaccinations among young adults [17*].

Behavioral health research and program delivery

Behavioral health studies on Facebook have included areas of mental health (e.g. depression, trauma and Post-traumatic Stress Disorder [PTSD]), substance use, and risky sexual behavior. Facebook has been used to recruit groups typically difficult to reach outside of clinical settings or through traditional community recruitment mechanisms (e.g. posting flyers, newspaper advertisements), such as sexual minorities for alcohol research studies [18*], immigrant groups not typically captured by available research methods in population estimates [19*], youth affected by violence [20*], and young adult U.S. veterans [21**]. Facebook has also been used in survey research to assess drug use attitudes and behaviors among young adults [22*,23**] and to recruit participants for interventions; such as U.S. veterans interested in reducing alcohol misuse and PTSD symptoms [24*], young adult smokers interested in smoking cessation programs [25**], and depressed individuals for an emailed intervention study [26*]. It has been used to screen individuals for mental health concerns and suicidal ideation [27*]. Intervention content has been delivered successfully on Facebook as well. For example, Facebook pages have been designed to promote condom use and other safe sex behaviors among young adults [28*,29*] and young urban Black women at high HIV risk [30*]. Researchers have also used Facebook as an intervention delivery tool for an approach to correct college students' misperceptions of their peers' drinking behavior [31*].

Recruitment on Facebook

The two main avenues to recruit participants via Facebook are through paid targeted advertisements and peer referral. Paid advertisements can involve direct promotion of study content through text and picture-based advertisements displayed in one's news feed or Facebook page side panel, promotion of text and picture based status updates posted on a study's Facebook page, and invitations to 'like' (publically endorse) the study's Facebook page. Advertisements can be tailored towards the interests, demographics (e.g. specifying an age range), and location (e.g. zipcode) of the targeted population. Although these methods are paid initially, once Facebook users see advertisements, they can begin to interact with them in ways that maximize the social network capabilities of Facebook. For example, an interested participant can 'like' an advertisement, make a comment on it, or share it with friends, which are actions that allow the Facebook users' friends to be alerted to the advertisement or study Facebook page to consider the opportunity to participant for themselves.

In addition, there is promise for researchers to recruit participants into behavioral health studies using respondent driven sampling (RDS) or snowball sampling methods, which utilize the site's inherent peer network structures to have Facebook users recruit other Facebook users (or peers not on Facebook) into studies. RDS has been successful for recruiting adolescents and young adults into studies and programs in areas of smoking cessation [32*,33], condom use [28*], and delivery of mental health information and provision of online support [34*]. Facebook also represents an avenue for gathering information about the population to generate alcohol and drug behavior prevalence estimates through RDS; for example, researchers recruited 22 initial 'seeds' and expanded the sample of 18–24 year olds to 3426 via Facebook friend referral [35*]. Of note, Facebook recruitment has typically focused on younger samples, with some work finding age differences between Facebook and other website-based recruitment mechanisms [36*] and others struggling with recruiting some groups such as middle aged women [8*].

Recommendations for using Facebook in health-related studies and programs

Consider the limits of Facebook

Facebook research excludes those individuals who do not have Facebook accounts and Internet access on a computer or phone. Although most Facebook campaigns discussed in the literature have been very successful, others have struggled. For example, Close and colleagues [16*] found their highest number of recruited participants (boys with Klinefelter syndrome) came during a brief one-week Facebook advertisement campaign, where visits to a study website increased from an average of two to three visits to the website per day to an average of 63 visits per

day during the campaign. However, Kapp and colleagues [8*] reported no success after an 11 day, \$300 advertisement campaign targeted toward women aged 35–49 years. Many factors will play into the success of a Facebook recruitment campaign, such as the population targeted (e.g. age, gender, race/ethnicity, national/global versus regional, specific group versus general population), incentives offered, and funding allotted to an advertisement campaign. In addition, one needs to understand the Facebook interests of the targeted population as advertisements are targeted on users' endorsed content (i.e., "likes"). However, some groups may not have "liked" content that would help identify them as appropriate research targets (e.g. a spouse of a problem drinker may not have "liked" Al-Anon groups on Facebook since doing so may reveal to his/her Facebook friends that their partner was a problem drinker).

Consider benefits and costs associated with Facebook versus other methods

Studies in both physical and behavioral health areas that have directly compared Facebook recruitment to traditional recruitment methods (e.g. flyers, approaching potential participants in clinics, email invitations) have found Facebook to be more successful in initial recruitment of participants [15*,16*,30*], as well as in finding participants already enrolled in studies that were otherwise not able to be located for follow-up research [7*,37**]. Some studies suggest Facebook is more cost effective than postal recruitment [16*,27*] and other Internet-based recruitment methods [15*,38**]. However, researchers have reported less success with recruiting depressed individuals on Facebook as compared to more cost-effective advertisements elsewhere [26*]. Like with any recruitment strategy, costs will vary depending on the population targeted and the nature of the study (e.g. one time survey or more time-intensive intervention study), but researchers have successfully recruited participants ranging from no cost or just a few dollars per recruited young adult participants (e.g. [7*,17*,21**,23**]) to upwards of \$10–\$30 per recruited adult participant for more intensive physical or behavioral health research (e.g. [10*,24*,26*]). Still, Facebook may not always be the most cost-effective approach [26*,38**] and researchers report variations in successful recruitment rates even within Facebook advertisement campaigns based on content (e.g. wording, pictures) [25**,27*].

Examine and report how samples compare to the targeted population

In order to establish Facebook as a viable recruitment mechanism and a legitimate population-based data source, it is important for researchers to report how their Facebook samples compare to available data sources that are accepted within the research community as adequate. For example, prevalence estimates of young adult substance use collected via RDS on Facebook have been

comparable to estimates obtained by the National Survey on Drug Use and Health [35^{*}], and young adult veterans recruited from Facebook were similar in most demographic factors to the broader population of young veterans reported by the American Community Survey and the Department of Defense (e.g. education level, income, age, gender; but not race/ethnicity or branch of service) [21^{**}]. For regional samples, comparisons with U.S. Census records are also important, such as research from the Minneapolis-St. Paul area that found a sample recruited from Facebook matched the race/ethnicity, but not the education level, of the regional population [17^{*}]. Even though population estimates may not match, Facebook can be useful in identifying and recruiting members of a specific group. For example, researchers targeting young Australian adults for mental health and suicidal ideation screening recruited individuals with higher rates of mental health problems than expected in the population, which was the group of interest targeted in the study [27^{*}]. Still, reporting comparisons with population estimates, and employing methods to improve representativeness of data such as use of post-stratification weights, can help establish Facebook as a viable approach to reach populations traditionally captured by more labor-intensive methods (e.g. phone-based random-digit dialing; mailed population-based surveys).

Check for misrepresentation and data validity

Since there is no face-to-face contact with participants recruited via online methods, there is potential for people to misrepresent themselves in order to receive study incentives. Researchers have attempted to reduce misrepresentation by checking their data thoroughly post-collection, not offering any incentives, requiring identifiable information only accessible to people within a certain group (e.g. requiring college student participants to have an “.edu” email address), verifying consistent responses across similar or repeated screening questions, and asking “insider knowledge” screening questions known only to people within the targeted group [21^{**},22^{*}]. These and other key methods for limiting misrepresentation and validating data in Facebook and general Internet-based research studies are outlined in detail by Kramer and colleagues [39^{*}].

Prepare for low recruitment rates and have methods to enhance retention

Since Facebook displays advertisements to a targeted but still large population, researchers should expect that many individuals who see advertisements and potentially click on them will not go on to complete surveys or programs. Although Facebook advertisements can be targeted to the population of interest, studies typically find recruitment rates as low as less than 1% of the targeted Facebook population, generally because advertisements are shown to hundreds of thousands to millions of Facebook users. This is evident at the global level as

well [40^{*}]. Thus, consideration of resources, costs available, and staff effort is needed prior to a campaign launch. In addition, while many potential participants may initially click on advertisements, most will drop-out before completing screeners [8^{*},11^{*},12^{*},21^{**},24^{*}]. Then, even after expressing interest and completing screeners, steep drop-out may again occur if they are asked to engage in intensive programs. For example, about half of the participants recruited for an HIV prevention study from Facebook dropped out of the study after being invited for the full study post-screening [30^{*}]. However, in this study, all but one of the participants continuing past screening returned to complete a one-month post-program follow-up survey; an impressive retention rate similar to that of college students completing a Facebook-delivered alcohol intervention [31^{*}]. Yet, other studies suggest low completion rates of intensive online interventions following Facebook recruitment [24^{*},28^{*}]. Thus, other methods to enhance retention (e.g. reminders via text message, phone, email) have been helpful in studies [15^{*}] and may be needed.

Conclusions

There are many benefits to using Facebook for research and programmatic efforts. As mentioned, Facebook’s popularity greatly expands the reach to individuals on a national or global scale and can access those not likely to see advertisements in clinics or elsewhere, such as stigmatized groups or those in remote or rural settings. Targeted advertisements help reach specific populations of interest to reduce costs. Internet-based programs can be accessed immediately from Facebook advertisements, which reduces the delay between recruitment and receipt of services seen in traditional studies. The social aspect inherent to Facebook allows for enrolled participants to recruit others for research studies. Challenges exist, however; and much is still to be learned about how to address potential drawbacks of Facebook research (and Internet-based research in general). There is also a lack of clear guidance around human subjects issues that may arise, such as handling of misrepresentation and management of posted responses to public advertisements that may identify individuals as study participants. In addition, Facebook is not the sole answer to finding “hard-to-reach” groups; indeed, most notably, Facebook cannot reach those with no Internet access. Other reviews exist that further detail the benefits and drawbacks of Facebook [41^{**},42^{*}]. Papers also discuss how to overcome drawbacks to recruitment, such as misrepresentation and retention, using Facebook and other Internet sites [39^{*},43,44,45^{*}].

Conflict of interest statement

None declared.

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- of special interest
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- This study demonstrates the feasibility of recruiting young women through Facebook to participate in screening for chlamydia. The majority of participants were willing to participate in screening by recruitment through Facebook and provide a urine sample collected at home. However, older participants were less comfortable with this sample collection method.
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- Assesses the feasibility of using a targeted Facebook advertisement campaign to recruit young women into a health study. The advertisement was linked to an external website through which interested individuals could submit their contact information to be assessed for eligibility. The average cost of advertising per compliant participant was \$20.
7. Jones L, Saksvig BI, Grieser M, Young DR: **Recruiting adolescent girls into a follow-up study: benefits of using a social networking website**. *Contemp Clin Trials* 2012, **33(2)**:268-272.
- The authors used a Facebook profile to reconnect with young women who participated in a previous study and could not be contacted through more traditional methods. Of these 175 young women, 78 were found on Facebook, 68 responded, and 43 participated in the follow-up study.
8. Kapp JM, Peters C, Oliver DP: **Research recruitment using Facebook advertising: big potential, big challenges**. *J Cancer Educ* 2013, **28(1)**:134-137.
- The authors used targeted Facebook advertising to recruit women in the USA ages 35–49 into a health research study. From this population, only 0.075% clicked on the advertisement, and 3.2% from this group proceeded past the introductory page.
9. Battistella E, Kalyan S, Prior JC: **Evaluation of methods and costs associated with recruiting healthy women volunteers to a study of ovulation**. *J Womens Health (Larchmt)* 2010, **19(8)**:1519-1524.
- Describes the costs of various recruitment methods used to enroll women in a study on ovulation. Broadcast e-mails and online recruitment (including paid Facebook advertisements) had the lowest costs per participant enrolled, other than word-of-mouth recruitment.
10. Arcia A: **Facebook advertisements for inexpensive participant recruitment among women in early pregnancy**. *Health Educ Behav* 2013, **41(3)**:237-241.
- A description of the method used to recruit pregnant women into an online survey through Facebook. The campaign reached over 7 million Facebook users over 18 weeks and yielded 344 eligible participants at a cost of less than \$4000.
11. Lohse B: **Facebook is an effective strategy to recruit low-income women to online nutrition education**. *J Nutr Educ Behav* 2013, **45(1)**:69-76.
- Costs and effectiveness of using Facebook to recruit low-income women were assessed. Of 465 people who clicked on the advertisement, 52 were eligible and completed a survey. The total cost of recruitment over 19 days was just under \$600.
12. Lohse B, Wamboldt P: **Purposive Facebook recruitment endows cost-effective nutrition education program evaluation**. *JMIR Res Protoc* 2013, **2(2)**:e27.
- Assesses costs and effectiveness of a Facebook advertisement recruiting campaign for two different nutrition education programs. Average costs per completed evaluation were around \$25 and \$19 for the two programs. About 800 Facebook users clicked on each advertisement, with 47 completing one program and 73 completing the other.
13. Richiardi L, Pivetta E, Merletti F: **Recruiting study participants through Facebook**. *Epidemiology* 2012, **23(1)**:175.
- A letter to the editor of a journal. The author describes the use of a Facebook page to communicate with participants in a longitudinal study and enhance recruitment. His team also used Facebook advertisements for a short time, which resulted in a significant increase in participants of the study at a relatively low cost as compared to previous recruitment techniques.
14. Hilton S, Smith E: **I thought cancer was one of those random things I didn't know cancer could be caught...": adolescent girls' understandings and experiences of the HPV programme in the UK**. *Vaccine* 2011, **29(26)**:4409-4415.
- Several techniques were used to recruit adolescent girls for this study, including Facebook advertisements. However, few details are provided on this recruitment practice.
15. Leonard A, Hutchesson M, Patterson A, Chalmers K, Collins C: **Recruitment and retention of young women into nutrition research studies: practical considerations**. *Trials* 2014, **15**:e12.
- Compares recruitment strategies targeting young women. Recruitment through Facebook and Twitter was more successful than recruitment through email and traditional methods. Use of email, phone and text message reminders was most effective at improving retention.
16. Close S, Smaldone A, Fennoy I, Reame N, Grey M: **Using information technology and social networking for recruitment of research participants: experience from an exploratory study of pediatric Klinefelter syndrome**. *J Med Internet Res* 2013, **15(3)**:e48.
- Compares the success of several techniques, including Facebook advertising, to recruit difficult-to-reach pediatric research participants (with Klinefelter syndrome). Of the many recruitment methods used, a Facebook advertisement linked to a recruitment website appeared to be the most successful.
17. Nelson EJ, Hughes J, Oakes JM, Pankow JS, Kulasingam SL: **Estimation of geographic variation in human papillomavirus vaccine uptake in men and women: an online survey using Facebook recruitment**. *J Med Internet Res* 2014, **16(9)**:e20.
- Discusses the response rate and costs of using Facebook to recruit young people in a major American city into a survey study. Slightly fewer than 50% of the individuals who visited the study website by clicking on the Facebook advertisement completed the survey. The average cost of advertising per completed survey was \$1.36.
18. Kaysen D, Davis KC, Kilmer J: **Use of social networking sites to sample lesbian and bisexual women**. *Addict News* 2011, **18(1)**:14-15.
- Assesses the method of using targeted Facebook advertisements to recruit young lesbian and bisexual women who are more representative of the population than previous samples. The authors found that varying the wording of the advertisements over time increased overall recruitment rates. Facebook advertisement costs, population representativeness, and concerns of false responses are discussed.
19. Baltar F, Brunet I: **Social research 2.0: virtual snowball sampling method using Facebook**. *Internet Res* 2012, **22(1)**:57-74.
- The authors used the Facebook search tool to identify and engage members of a hard-to-reach population (Argentinean immigrant entrepreneurs in Spain). They found this method to be more effective than traditional snowball sampling, and identified 214 cases.
20. Chu JL, Snider CE: **Use of a social networking web site for recruiting Canadian youth for medical research**. *J Adolesc Health* 2013, **52(6)**:792-794.
- The authors describe Facebook advertising as a cost-effective approach to recruiting adolescents for medical research. Their cost per included subject totaled just over \$15. The advertisement was seen over 17 million times, resulting in 181 subjects recruited and 88 included in the study.
21. 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)**:e17.

Discusses the use of Facebook advertisements to recruit a sample from the young adult veteran population in three weeks. The sample collected matched that of the larger US population of young adult veterans, except on the composition of race/ethnicity and branch of service. Over 1000 eligible veterans completed the survey, with an average advertising cost of about 7 dollars per eligible participant.

22. Lord S, Brevard J, Budman S: **Connecting to young adults: an online social network survey of beliefs and attitudes associated with prescription opioid misuse among college students.** *Subst Use Misuse* 2011, **46(1)**:66-76.

Discusses the use of Facebook to recruit college students into a survey during the early days of Facebook (2005). A 2-week advertisement garnered 527 eligible and completed survey responses. The authors describe this recruitment rate as higher than for typical online recruitment campaigns.

23. 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.

Evaluates the use of targeted Facebook advertisements to recruit young cigarette users into an online survey. The authors used 20 advertisements over a 13 month period to garner about 1500 completed and eligible surveys. The average cost of advertisement per usable survey was \$4.28.

24. Brief DJ, Rubin A, Keane TM, Enggasser JL, Roy M, Helmut E, Hermos J, Lachowicz M, Rybin D, Rosenbloom D: **Web intervention for OEF/OIF veterans with problem drinking and PTSD symptoms: a randomized clinical trial.** *J Consult Clin Psychol* 2013, **81(5)**:890-900.

Recruitment for a randomized clinical trial was conducted with targeted Facebook advertisements. Over 11 000 individuals visited the website in 46 days, and 600 eligible participants were included in the study. The sample was "reasonably representative of the current population of active duty personnel." Participants were compensated, but the authors do not include costs of recruiting through Facebook.

25. Ramo DE, Rodriguez TMS, Chavez K, Sommer MJ, Prochaska JJ: **Facebook recruitment of young adult smokers for a cessation trial: methods, metrics, and lessons learned.** *Internet Interv* 2014, **1(2)**:58-64.

Discusses the effectiveness and costs of various methods for recruiting young adult smokers through Facebook advertisements. The authors generated and tested 36 different advertisements over 7 weeks. The advertisement which appeared on Facebook newsfeeds and contained images of smoking resulted in the most clicks at the lowest cost. The recruitment campaign resulted in 79 eligible participants and cost an average of \$8.80 per participant.

26. Morgan AJ, Jorm AF, Mackinnon AJ: **Internet-based recruitment to a depression prevention intervention: lessons from the Mood Memos study.** *J Med Internet Res* 2013, **15(2)**:e31.

Several Internet-based recruitment sources, including Facebook, were used to enroll participants in an online depression intervention. The most effective recruitment technique identified by the authors was Google advertising. They explained that the downside to Facebook advertising was that it targets users based on demographics and their interests, which are not as useful as search keywords when identifying individuals with health conditions such as depression.

27. Batterham PJ: **Recruitment of mental health survey participants using Internet advertising: content, characteristics and cost effectiveness.** *Int J Methods Psychiatr Res* 2014, **23(2)**:184-191.

The authors tested the cost-effectiveness of two online recruitment techniques against postal recruitment to complete a survey. Both online techniques were more cost-effective than the postal technique. It was found that recruiting for the survey through an advertisement and a Facebook page was more cost-effective than recruiting through an advertisement alone.

28. Bull SS, Levine DK, Black SR, Schmiede SJ, Santelli J: **Social media-delivered sexual health intervention: a cluster randomized controlled trial.** *Am J Prev Med* 2012, **43(5)**:467-474.

Evaluates the effectiveness of an intervention delivered through Facebook on condom use behaviors among people aged 16-25 years. The authors used several methods for recruitment, including Internet-based advertisements (Facebook not specifically mentioned). The intervention consisted of a Facebook page developed by the authors to provide information about sexual health. At 2 months, participation in the intervention was associated with higher condom use. However, no effects were observed at 6 months.

29. Nguyen P, Gold J, Pedrana A, Chang S, Howard S, Ilic O, Hellard M, Stooze M: **Sexual health promotion on social networking sites: a process evaluation of the FaceSpace project.** *J Adolesc Health* 2013, **53(1)**:98-104.

Evaluates the reach and effectiveness of a sexual health promotion project aimed at people aged 16-29 and delivered through Facebook. The authors used Facebook advertisements and tagged photos of young people on a Facebook page to reach their audience. They measured success by numbers of comments and "likes" on their photos, videos, and Facebook page, but no intervention was delivered.

30. Jones R, Lacroix LJ, Nolte K: **"Is your man stepping out?" An online pilot study to evaluate acceptability of a guide-enhanced HIV prevention soap opera video series and feasibility of recruitment by Facebook advertising.** *J Assoc Nurses AIDS Care* 2015, **26(4)**:368-386.

Assesses the feasibility of using Facebook advertising to recruit high-risk women (i.e. low income, low education, urban environment). This technique resulted in recruitment of 10 participants per week, compared to 7 participants per week with previous field recruitment. Facebook advertising enabled recruitment of participants from a large geographic area.

31. Ridout B, Campbell A: **Using Facebook to deliver a social norm intervention to reduce problem drinking at university.** *Drug Alcohol Rev* 2014, **33(6)**:667-673.

Discusses the use of Facebook to assist in delivery of an intervention to university students. Email invitations, rather than Facebook methods, were used to recruit participants. About half of the 95 participants who screened positive for hazardous drinking received an intervention which included Facebook messages with personalized social norms feedback. The authors observed positive effects of the intervention on drinking behaviors and perceived drinking norms.

32. Sadasivam RS, Volz EM, Kinney RL, Rao SR, Houston TK: **Share2quit: web-based peer-driven referrals for smoking cessation.** *JMIR Res Protoc* 2013, **2(2)**:e37.

Discusses the use of Facebook tools to implement a respondent-driven sampling procedure to recruit participants for a tobacco cessation program. The authors describe recruitment of an initial sample of current and former smokers as seeds, and training them to refer other smokers from their social networks into the program. At the time of publication, this recruitment had not yet been done, so cost effectiveness information is not available.

33. Sadasivam RS, Cutrona SL, Volz E, Rao SR, Houston TK: **Web-based peer-driven chain referrals for smoking cessation.** *Stud Health Technol Inform* 2013, **192**:357-361.

34. Ellis AL, Collin P, Davenport AT, Hurley JP, Burns MJ, Hickie BI: **Young men, mental health, and technology: implications for service design and delivery in the digital age.** *J Med Internet Res* 2012, **14(6)**:e160.

The authors used a targeted Facebook advertisement campaign to recruit young people to participate in an online survey. Snowball sampling was also used by encouraging participants to inform their peers about the survey. The average cost per click on the Facebook advertisement was \$0.42.

35. Bauermeister JA, Zimmerman MA, Johns MM, Glowacki P, Stoddard S, Volz E: **Innovative recruitment using online networks: lessons learned from an online study of alcohol and other drug use utilizing a web-based, respondent-driven sampling (webRDS) strategy.** *J Stud Alcohol Drugs* 2012, **73(5)**:834-838.

Describes a web-based respondent-driven sampling strategy to recruit a sample of young adults. The authors used targeted advertisements on Facebook to recruit a small group of demographically diverse "seed" participants. Referrals were made by these "seed" participants and subsequent participants to collect the full sample. The authors discuss the unique strengths and challenges of this recruitment method.

36. Rife SC, Cate KL, Kosinski M, Stillwell D: **Participant recruitment and data collection through Facebook: the role of personality factors.** *Int J Soc Res Methodol* 2014, **2014**:1-15.

The authors compared a participant sample collected through Facebook recruitment with other samples collected through a standalone website and through undergraduate students. Differences between these samples were small, and the authors concluded that recruiting through Facebook can produce sufficiently representative samples.

37. Mychasiuk R, Benzie K: **Facebook: an effective tool for participant retention in longitudinal research.** *Child Care Health Dev* 2012, **38(5)**:753-756.

The authors used Facebook to identify and reconnect with participants who had been lost in the course of a longitudinal study of low-income urban families, decreasing attrition by 16%. A Facebook account was developed for the study and the authors used the Facebook search engine to identify lost participants. Facebook's messaging system was used to communicate with these participants.

38. Ramo DE, Hall SM, Prochaska JJ: **Reaching young adult smokers through the Internet: comparison of three recruitment mechanisms.** *Nicot Tob Res* 2010, **12(7):768-775.**

Compares the use of e-mail invitations, Craigslist advertisements, and a third-party advertising service (AdBrite) for recruiting smokers aged 18–25 into an online survey. AdBrite published advertisements for the study on websites such as Facebook and Myspace. Facebook accounted for 7.4% of the recruited eligible participants from the website-based advertisements. Overall, website-based advertisements were responsible for the largest number of completed surveys, but Craigslist advertisements and targeted sampling strategies were more cost effective because they were better able to target young adult smokers.

39. Kramer J, Rubin A, Coster W, Helmuth E, Hermos J, Rosenbloom D, Moed R, Dooley M, Kao YC, Liljenquist K *et al.*: **Strategies to address participant misrepresentation for eligibility in web-based research.** *Int J Methods Psychiatr Res* 2014, **23(1):120-129.**

Discusses strategies to prevent misrepresentation of participants recruited through Internet-based methods. One strategy is to only allow participants to enroll in a study if they access the study's website through a Facebook advertisement. No other references to Facebook are made in this article.

40. Thomson R, Ito N: **Facebook advertisements for survey participants recruitment: considerations from a multi-national study.** *Int J Electr Commer Stud* 2014, **5(2):199-218.**

Discusses the effectiveness of Facebook advertisements to recruit participants in a 20-country study. The authors collected responses from

399 participants from 18 countries in 7 days. They discuss the low responses rates of Facebook users in certain countries and the difficulties of soliciting user data from Facebook.

41. Amon KL, Campbell AJ, Hawke C, Steinbeck K: **Facebook as a recruitment tool for adolescent health research: a systematic review.** *Acad Pediatr* 2014, **14(5):439-447.**

A review of the literature from 2004 to 2013 on the use of Facebook to recruit adolescents for health research. The authors identified 6 studies which met inclusion criteria and discovered three recruitment methods using Facebook: paid advertising, the Facebook search tool, and creating a Facebook page.

42. Ryan GS: **Online social networks for patient involvement and recruitment in clinical research.** *Nurse Res* 2013, **21(1):35-39.**

A methodological review of previous literature addressing recruitment through online social networking. The author concluded that this type of recruitment is cost-effective and efficient, Facebook can improve retention in longitudinal studies, and recruitment using a mixed approach of social networking and traditional methods is most effective.

43. Murray E, Khadjesari Z, White RI, Kalaitzaki E, Godfrey C, McCambridge J, Thompson GS, Wallace P: **Methodological challenges in online trials.** *J Med Internet Res* 2009, **11:e9.**

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A peer-reviewed commentary. The author describes the benefits of using social media, such as Facebook, to recruit participants for clinical trials. An overview of the opportunities, advantages and challenges associated with social media recruitment is provided.