

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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Current Opinion in Psychology 2016, 9:38–43

This review comes from a themed issue on **Social media and applications to health behavior**

Edited by **Melissa A Lewis** and **Clayton Neighbors**

For a complete overview see the [Issue](#) and the [Editorial](#)

Available online 28th September 2015

<http://dx.doi.org/10.1016/j.copsyc.2015.09.011>

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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

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