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To cite this article: Eric R. Pedersen , Karen Chan Osilla, Eric D. Helmuth, Anagha Tolpadi & Kristie Gore (2017) Reaching Concerned Partners of Heavy Drinking Service Members and Veterans through Facebook, Military Behavioral Health, 5:3, 265-273, DOI: [10.1080/21635781.2017.1316804](https://doi.org/10.1080/21635781.2017.1316804)

To link to this article: <http://dx.doi.org/10.1080/21635781.2017.1316804>



Accepted author version posted online: 13 Apr 2017.
Published online: 13 Apr 2017.



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Reaching Concerned Partners of Heavy Drinking Service Members and Veterans through Facebook

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ABSTRACT

Military populations are hard to reach for alcohol interventions. The authors used a Facebook ad campaign to successfully recruit military spouses who were concerned about their service member or veteran partner's drinking behaviors. In 90 days, the authors recruited 306 participants for a cost of \$42.82 per participant. Ads featuring a monetary incentive were most popular, and 89% of participants learned about the study on their cell phones. In addition to enrolling those reporting concern over their partner's drinking, the authors were able to recruit a population in need, as less than half of participants with depression, anxiety, or hazardous alcohol use received services for themselves in the past year.

KEYWORDS

Alcohol; military; spouse; partner; online; Facebook; Partners Connect; Community Reinforcement and Family Training

Introduction

Heavy alcohol use in the military is associated with personal and social consequences for service members and veterans themselves, but also with consequences that can negatively affect one's spouse, such as occupational problems that could result in loss of family's income, poor marital quality, and intimate partner violence (Institute of Medicine, 2012; Mattiko, Olmsted, Brown, & Bray, 2011; Milliken, Auchterlonie, & Hoge, 2007; Rabenhorst et al., 2012; Riviere, Merrill, Thomas, Wilk, & Bliese, 2012; Sayers et al., 2009). Moreover, heavy drinking by service members and veterans puts their spouses at elevated risk for behavioral health problems, such as depression, anxiety, social impairments, and heavy drinking themselves (Booth et al., 2007; Eaton et al., 2008; Erbes et al., 2012). Yet, few service members, veterans, and their spouses seek counseling for alcohol-related problems (Burnett-Zeigler et al., 2011; Gorman et al., 2011; Schell & Marshall, 2008), and innovative methods are needed to reach out to the military population to prevent the development of long-term mental health and alcohol use problems.

Despite the need for services, service members and veterans report barriers to seeking alcohol use care because of concerns about limited confidentiality, negative occupational repercussions (e.g., fear an alcohol use disorder diagnosis would appear in their military record), embarrassment or stigma from peers, and limited availability to attend scheduled appointments (Burnett-Zeigler et al.,

2011; Garcia et al., 2014; Hoerster et al., 2012; Hoge et al., 2004; Schell & Marshall, 2008; Vogt, 2011). Military spouses report similar barriers, such as concerns about negative job repercussions for their partners, not knowing where to get help, difficulty scheduling appointments, difficulty getting time off work or finding child care, and concerns services cost too much money (Eaton et al., 2008; Osilla et al., 2016). Pragmatically, military spouses are a hard-to-reach population for intervention efforts because of factors such as difficulty finding family members as a result of relocation or inaccurate contact records (Corry, Williams, Battaglia, McMaster, & Stander, 2017; Faulk, 2012; Tanielian, Trail, & Corry, 2017).

Finding novel ways to reach military spouses is necessary not only because they need behavioral health care services themselves because of their partner's drinking, but as a spouse they can also be an important catalyst for changing their service member or veteran partner's drinking. First, spouses (and in many cases, unmarried partners) are motivated to help their partners reduce drinking, not only out of a selfless desire to improve their partner's health, but also to alleviate their own experiences with anxiety, depression, and marital conflict that is a direct result of the partner's drinking (Halford & Osgarby, 1993; Thomas & Agar, 1993). Second, military spouses are likely first-line identifiers of their partner's alcohol-related problems (Kaufmann, 1999; Sobell & Sobell, 1993). As such, spouses can communicate with partners about how their drinking

impacts their family, as well as be a support system for the individual if they do decide to pursue treatment (Marshall, 2003; Meyers & Wolfe, 2003; Smith & Meyers, 2007; Steinglass & Robertson, 1983). Third, spouses have been shown to actually effect change. For example, among the military population, being married is associated with increased help-seeking behavior for behavioral health concerns (Blais & Renshaw, 2013) and service members who have pursued care report that partner encouragement is an influential factor that helped support their initiation and completion of treatment (Burnett-Zeigler et al., 2011). In the general population, individuals who successfully change drinking patterns most often cite partner support as the most helpful mechanism in supporting change (Project MATCH Research Group, 1997).

The Partners Connect intervention

To reach military spouses, we developed the Partners Connect intervention (Osilla, Pedersen, Gore, Trail, & Howard, 2014; Osilla et al., 2016), which was designed as a stand-alone web-based adaption of the Community Reinforcement and Family Training (CRAFT; Meyers & Wolfe, 2003; Smith & Meyers, 2007). CRAFT targets concerned partners and is typically composed of 12 individual in-person sessions that focus on positive communication and other behavioral reinforcement and punishment strategies to influence their partner's drinking. Given that the in-person format of CRAFT may be less appealing to military spouses concerned about confidentiality or stigma of care receipt, we developed Partners Connect as a stand-alone, online intervention aimed to be a first step for concerned military partners who might not otherwise access services. The intervention focused on helping military spouses improve their own well-being through self-care, learn skills to communicate in a more healthy manner with their partner, and help them to support changes in their partner's drinking before alcohol misuse escalates to a more severe alcohol use disorder. Using a web-based intervention to target military spouses in this regard was expected to help overcome barriers to seeking in-person care, as the program included desired anonymity and privacy and encouraged self-guided pacing.

Recruitment of concerned military spouses

Although an online intervention for military spouses would greatly expand access to care for this population, we first needed to establish a way to identify and enroll them. We looked outside of traditional military care settings and beyond recruitment strategies used in previous

studies of civilian spouses (e.g., newspaper and radio advertisements; Meyers, Miller, Smith, & Tonigan, 2002; Rychtarik, McGillicuddy, & Barrick, 2013) and explored Internet recruitment, as approximately 75% of veteran spouses and 94% of active duty spouses report willingness to use the Internet to carry out research on services available to them and their partners (Westat, 2010). We designed an advertisement campaign on Facebook, which is among the top three most popular websites in the United States and the most used social media platform in the country (Alexa Internet, 2016). Military spouses are online and on Facebook, making the website an appropriate and attractive vehicle to reach this population. Facebook pages tailored to military spouses have large numbers of followers. For example, as of March 2017, approximately 125,700 Facebook users follow Military Spouse Central, 85,500 follow National Military Family Association, and 69,900 follow Blue Star Families. Pages for supporters of veterans and service members also have large numbers of followers (e.g., more than 3.27 million follow Wounded Warrior Project; more than 533,000 follow Iraq and Afghanistan Veterans of America) and Facebook itself reported that 12.5 million of its users in 2014 were family members of service members and veterans (Facebook Newsroom, 2014).

For the present study, we evaluated the feasibility of using Facebook to recruit military spouses who were concerned about their service member or veteran partner's drinking. In this article, we first discuss the advertisement strategy for the Facebook campaign, including strategic efforts to increase population engagement by testing different advertising messages emphasizing various motivations for research participation (e.g., receiving a financial incentive versus learning new skills to help their family). We describe the eligibility criteria and recruitment rates from the ad campaign, as well as the cost and timeliness of recruitment. In addition, we describe the sample in terms of demographics, behavioral health symptoms (mental health symptoms of depression and anxiety, alcohol misuse), and behavioral health treatment receipt to explore whether we were able to recruit military spouses concerned about their partner's drinking behavior who were experiencing their own behavioral health distress and not otherwise receiving services.

Method

Participants and procedures

Participants were recruited as part of a larger study of the Partners Connect intervention, which is described in detail in our prior work (Osilla et al., 2014). In short, it is

a four-session web-based intervention that offers strategies for self-care and improved communication for military spouses concerned about a partner's drinking. For eligibility criteria, participants needed to (a) be at least 18 years old; (b) be in a romantic relationship with the identified drinker; (c) be living with their partner; (d) not be in the military currently themselves; (e) have Internet access; (f) have no plans to separate from their partner in the next 60 days; (g) indicate at least a value of "3" on scale from 1 (*not at all*) to 7 (*very much*) for the degree to which they felt their partner had an alcohol problem, (h) indicate they believed they would be in no danger if their partner found out about their participation in the study; (i) indicate no general concerns they would be physically hurt by their partner; and (j) be willing to try an online program focused on communicating with their partner about his or her drinking.

A series of paid ads were shown to individuals on Facebook. To show ads to the relevant population (i.e., military spouses who were concerned about their partner's drinking), we targeted ads using a number of specific keywords on the basis of content "liked" and of interest to Facebook users (e.g., "military spouse magazine," "Military Spouses Coalition," "National Military Family Association"), as well as Facebook group pages for specific military bases (e.g., "[Base] Wives," "[Base] Family and Morale, Welfare and Recreation," "U.S. Army [Base]"). We considered targeted keywords related to individuals concerned about a loved one's drinking (e.g., "Al-Anon"), but these keywords would have shown our ads to a much larger Facebook population beyond military spouses. Also, given the concerns of military spouses about negative job repercussions for heavy drinking partners, it was unlikely the concerned partners we were seeking would have publically "liked" such content that could have identified them as someone with a heavy drinking partner. For the purposes of this study, we targeted women (as more than 90% of military spouses are female; Office of the Deputy Under Secretary of Defense, 2015; Westat, 2010) ages 40 years or younger who lived in the United States. The Facebook ads contained photos and text that featured a message about financial incentives and how participating in this study could help them by learning new skills. Two similar but distinct ad sets featured either the monetary incentive or a message about receiving help (i.e., clinical benefit). For example, the monetary incentive focused ad included prominent text of "Earn \$120 to check out a web program for military spouses worried about a loved one's drinking" and "Concerned about your partner's drinking? Learn new skills and earn \$120," whereas

the help-focused ad set included prominent text of "Check out a FREE web program for military spouses worried about a loved one's drinking" and "Concerned about your partner's drinking? Learn new skills to help your family." Both ad sets featured pictures of military couples and families, as well as additional text of "Hey military spouses! Do you live with a military partner whose drinking has caused problems? See how the FREE and CONFIDENTIAL Partners Connect online program can help you and your family. Earn \$120."

Participants clicking on the ads were directed to a website that described the study and a 10-item screening questionnaire. Eligible participants proceeded to an online consent form. If they consented, they began a baseline survey and were randomized to either receive the intervention or a control condition where they were given the option to complete Partners Connect 5 months later. Participants completed a 5-month follow-up survey. Only baseline data are examined in the present study. All procedures for advertising, consent, and survey methods were approved by the study's institutional review board.

A total of 483 military spouses completed the brief screening survey, of which 171 were ineligible. Eligible military spouses ($N = 312$) completed a baseline survey and received a \$25 Amazon gift card as an incentive for survey completion. After completion of baseline, we removed four participants through a series of data verification checks (e.g., partner's pay grade and rank did not match) and removed two participants who had left most of the baseline survey items blank. These procedures helped us to verify to the best of our ability that participants in our online study were not misrepresenting themselves to obtain financial incentives (Kramer et al., 2014; Pedersen et al., 2015, 2017). The final sample was 306 individuals.

Measures

Facebook analytic measures were collected from statistics available from Facebook through the Ads Manager page, accessible by the study team only. Participants completed self-report measures of participant and partner characteristics on the baseline online survey.

Facebook analytics

Measures collected from the Facebook advertisement strategies were click-through rates (i.e., percentage of people who clicked an ad out of all the people who the ad was presented to on Facebook), cost per click (i.e., the cost associated with someone clicking on an ad), and length of time each ad was running online.

Participant demographics

Military spouse participants completed items regarding their gender, age, Hispanic ethnicity (yes/no), racial group, highest grade level completed, marital status (currently married vs. not married), length of marriage (if married), and whether they had children. Participants also indicated what state they lived in, how they heard about the study (i.e., saw an ad on a Facebook, saw it posted by a group or organization they followed on Facebook, friend/relative sent information to them, other) and what kind of device they were using when they learned about the opportunity to participate and completed the survey (e.g., computer, mobile phone).

Participant behavioral health and treatment receipt

Participants completed the Generalized Anxiety Disorder (GAD) 7-item scale (Spitzer, Kroenke, Williams, & Lowe, 2006), which assessed seven symptoms of generalized anxiety disorder (e.g., not being able to stop or control worrying, feeling afraid as if something awful might happen) on a scale from 0 (*not all*) to 4 (*nearly every day*). Scores of 10 or higher are indicative of moderate/severe symptoms of anxiety and are an optimal screener for a GAD diagnosis (Spitzer et al., 2006). Depressive symptoms were assessed with the 8-item Patient Health Questionnaire (PHQ-8; Kroenke et al., 2009), which measured eight symptoms of depression (e.g., feeling down, depressed, or hopeless; feeling tired or having little energy) on a scale from 0 (*not all*) to 4 (*nearly every day*). Scores of 10 or higher are indicative of a major depressive disorder (Kroenke et al., 2009). The three consumption items from the Alcohol Use Disorders Identification Test (Bush et al., 1998) assessed the participant's own level of hazardous drinking, with scores of 3 for women (4 for men) indicative of hazardous drinking or an active alcohol use disorder. Participants were asked whether they had received any "mental health counseling, therapy, or self-help for personal or emotional issues" in the past year (yes/no).

Partner characteristics

Participants reported on their partner's characteristics by indicating their partner's military status (active duty, reserve/guard, veteran) and their partner's current/former branch of service. Participants were asked whether they thought their "partner received help for his/her drinking or emotional issues," with response options of "yes," "no," or "don't know." No timeframe for this help was specified and it is assumed participants filled this out considering whether their partner had ever received care.

Data analytic plan

We describe the advertisement strategy using metrics available on the Facebook website, including number of clicks on each ad, cost per click, overall cost of the ad campaign, and cost per participation goal. We linked each of the Facebook ads to the study website's Google Analytics account with a unique URL tracking code, so that we could identify and isolate the website visits from individual Facebook ads, and in turn, see how many of each ad's referred visitors reached key milestones in study recruitment, from completing the eligibility screening to completing the baseline survey. We compared these metrics across the two types of ads (i.e., ones featuring the monetary incentive and ones featuring a message about receiving help). In Table 1, we include our sample demographics and summary of the partner

Table 1. Facebook-recruited sample characteristics ($N = 306$).

Participant characteristics	Partners Connect sample
Demographics	
Female gender	95.1%
Mean age	32.23 (6.39)
Age younger than 45 years	86.2%
Age 30 years or younger	43.0%
Bachelor's degree or higher	40.6%
Hispanic ethnicity	11.4%
Race (White)	73.2%
Race (non-White)	26.8%
Children	80.1%
Currently married	90.3%
Participant behavioral health and treatment receipt	
Positive depression screen	26.1%
Positive generalized anxiety screen	29.1%
Positive screen for hazardous drinking	42.1%
Participants received care for personal behavioral health concerns	32.1%
Partner characteristics	
Partner type	
Active duty spouse	63.2%
Veteran spouse	28.5%
Reserve/Guard spouse	8.3%
Partner's branch of service	
Army	59.3%
Navy	9.9%
Marine Corps	15.2%
Air Force	7.3%
Army National Guard	4.3%
Army Reserve	1.7%
Navy Reserve	0.0%
Marine Corps Reserve	0.3%
Air National Guard	0.3%
Air Force Reserve	1.0%
Coast Guard	0.3%
Coast Guard Reserve	0.3%
Partner's receipt of care ^a	
Partner ever received help for his/her drinking or emotional issues	19.7%

Note. Between 4 to 8 participants did not respond to particular questions included in the table. Percentages reported are based on the number of participants who responded out of the 306 total participants.

^aPercentage endorsing "yes" response to item only. Both "no" and "don't know" responses are counted as not receiving care.

characteristics, which were conducted using frequencies and means descriptive analyses.

Results

Facebook advertisement campaign

Pay-per-click ads to promote the study to military spouses were placed on Facebook over a 90-day advertising period, with ads running on 50 of those days. Ads ran on Facebook's mobile phone apps, tablet apps, on the Facebook website viewed on computer web browsers, and on third-party apps and websites in Facebook's "audience network" of ad placements. Ads were seen by approximately 363,000 individuals who were selected with the demographics and interest targeting criteria described earlier. A total of 29,480 individuals measurably engaged with an ad, with the most common action being a click of the link to the study website (36,106; some individuals clicked the link more than once). Fewer clicked the "Like" button for the ad (1,535), clicked the "Like" button for the Partners Connect page that sponsored the ad ($n = 247$), shared the ad with their friends on Facebook ($n = 229$), or commented on the ad ($n = 62$). We were charged only when someone clicked the link to our website. The overall click-through rate (CTR; ad views divided by unique click-throughs) was 1.01% and the average cost per click (CPC) was \$0.36. The total expenditure was \$13,102 and the average cost per consented and valid participant who completed a baseline survey ($N = 306$) was \$42.82.

Typically, ads with the highest Facebook CTR and lower CPC are an indicator of success because more people are clicking the ads at the least cost. However, when comparing the CTR and CPC against the number of study participants who completed baseline surveys, we found a different pattern. In one head-to-head examination, simultaneous comparison of identical ads were shown in two different placement options—on Facebook only versus its third-party audience network apps and sites. The audience network ads had a robust 4.34% CTR and a low CPC of \$0.18, but these ads were much more expensive per completed baseline survey (\$160) compared to Facebook-only ads (\$56) despite much weaker Facebook engagement and cost metrics (0.46% CTR and \$1.07 CPC). Thus, ads on the audience networks were abandoned approximately one week into the study to reduce costs.

As with the ad placement options, we also systematically tested different ad content elements over the course of the campaign, in order to progressively refine the ad elements leading to the best performing and most cost-

effective ads. Elements we varied and tested included the stock photographs used for the ad image, text overlaying the ad image, leadoff text at the top of the ad, and secondary text under the image. The most dramatic differentiator was including the study's financial incentive in the leadoff text. Ads that emphasized the \$120 study payment in the leadoff text produced visitors who began eligibility screening and finished the baseline survey at a rate of 6.42% and a per-baseline cost of \$19. The comparison ads, run simultaneously and shown to the same target audience, omitted the study payment in the leadoff text in favor of a description of the clinical benefit only; these produced visits with a 2.86% baseline completion rate and a \$49 per-baseline cost.

No significant differences in ad performance were observed between visits from ads served on smartphones, tablets and computers. Smartphones, however, were by far the dominant platform, comprising 88.3% of all ads shown versus 7.3% on a desktop computer and 4.4% on a tablet.

Description of the Facebook-recruited sample

Participant demographics

Table 1 describes the sample. As expected, most participants were women younger than 45 years of age. Participants were predominantly White, though about 1 in 10 reported Hispanic ethnicity and more than one quarter reported non-White race. Eighty percent had children. Ninety percent were currently married to their military partner, with a mean of 7.5 years ($SD = 4.9$ years) married for those currently married.

Participants came from 39 states, with North Carolina, Texas, California, Virginia, and Washington representing at least 20 participants each. Most participants (79.8%) reported hearing about the study directly via an ad they saw on Facebook on their computer or on the Facebook app on their phone. Participants also heard about the study from a friend or relative who e-mailed them the link to the study or tagged them to alert them to an ad (9.3%), by seeing one of the groups or organizations they follow on Facebook post an announcement about the study (8.3%), or some other method (e.g., spouse referred them, saw it posted in on online blog; 2.6%). Most participants heard about the study while on their mobile phones (88.6%). Others were on a personal computer (11.1%) and one participant was on a public computer (e.g., at a library; 0.3%). Regarding completing the baseline survey, 74.9% did so on their phones while 25.1% completed it on a personal computer.

Participant behavioral health and treatment receipt

Between 26% and 42% of participants screened positive for depression, generalized anxiety, or hazardous drinking, with

39.1% of the sample as a whole reporting any past year behavioral health treatment (see Table 1) Among the 80 participants (26.1% of the sample) who screened positive for GAD, 46.8% reported receipt of care for themselves. Among the 89 who screened positive for depression (29.1%), 37.1% reported receipt of care for themselves. Among the 129 who screened positive for hazardous drinking (42.1%), 36.4% reported receipt of care for themselves.

Partner characteristics

Table 1 also details participants' reports of their partner's characteristics. Of participants, 63% had active duty partners, 29% had veteran partners, and 8% had partners in reserve or guard units. Most were affiliated with the Army (65%), with 15% affiliated with the Marine Corps, 10% affiliated with the Navy, 9% affiliated with the Air Force, and 1% affiliated with the Coast Guard. Of the participants, 96% indicated that their partner was of the opposite sex, 4 participants indicated their partner was of the same sex and 8 participants did not indicate their partner's gender. Approximately 20% of all participants reported their partner received care at some point in their lifetime for drinking or an emotional issue.

Discussion

This study aimed to determine whether Facebook could be a viable mechanism through which to reach military spouses concerned about their service member or veteran partner's drinking. Military spouses were targeted for an online-based intervention effort, Partners Connect, to help them increase self-care and reduce their own behavioral health distress, increase positive communication skills with their partners, and help support changes in their partner's drinking. Using Facebook, we recruited 306 military spouses who were concerned about their partner's drinking behavior and experiencing their own behavioral health concerns but were not otherwise seeking care for themselves nor were their partners seeking care. The Facebook ad campaign lasted 90 days, with ads running for 50 days, for a total cost of \$13,102 (\$42.82 per obtained participant). The sample we recruited was primarily female and non-Hispanic White, which matches data from the larger military spouse population (Office of the Deputy Under Secretary of Defense, 2015; Westat, 2010). Most were currently married to their partners and had children. More than 60% were in relationships with active duty personnel. Despite all participants screening into the study by indicating concern for the partner's drinking, only 20% reported that their partners had ever received help for drinking or for emotional issues. Participants themselves reported behavioral health problems, with between 26% and

42% screening positive for depression, anxiety, or hazardous alcohol use, yet less than half of participants with each of these positive screens receiving treatment themselves in the past year. Thus, it appeared that Facebook can be an effective mechanism for finding military spouses in need in order to provide them with an intervention that they may not have received otherwise.

The successful Facebook ad campaign follows other studies indicating that Facebook can help reach individuals in need of behavioral health services (Pedersen & Kurz, 2016) and it can be cost-effective for a population that is difficult to reach for research and programmatic efforts (Corry et al, 2017; Faulk et al., 2012; Tanielian et al., 2017). Expanding on our prior work recruiting military veterans via Facebook for alcohol research and intervention efforts (Brief et al., 2013; Pedersen et al., 2015, 2017), the present study suggests the website can similarly reach the partners of heavy drinkers in the military population. This is particularly important given that both military spouses and service members and veterans report substantial barriers to seeking in-person care for behavioral health problems, including heavy alcohol use (Burnett-Zeigler et al., 2011; Eaton et al., 2008; Gorman et al., 2011; Schell & Marshall, 2008).

We gleaned three main lessons from this study. First, ads that featured a monetary incentive were more popular, more so than ads that featured gaining help for one's family. Yet, all ad types mentioned the incentives and although study incentives are typically a focus of recruitment ads for research studies, it is not well understood how Facebook can be used to recruit concerned military spouses into intervention efforts without the offering of remuneration. Indeed, our qualitative pilot work with this population confirmed that the promise of the Amazon gift cards was a factor involved in their decision to click on ads (Osilla et al., 2016). Offering incentives to participate or providing other similar contingency management methods may be a helpful method for recruiting treatment-reluctant populations into future clinical trials.

A second lesson learned was that ads focused on Facebook-only sites (as opposed to third party sites) were more cost-effective when translating to baseline survey completion. We learned that it was important to consider multiple metrics (e.g., CTR, CPC) when determining the most cost-effective social media recruitment strategy. However, at approximately \$42 per enrolled participant, the overall cost to recruit participants for this study could be viewed as expensive and perhaps unfeasible in situations where researchers or outreach workers are seeking to locate the population for a low cost. Other work has found that Facebook advertising cost can be wide ranging when recruiting research participants, and costs vary depending on targeted population

and study focus (e.g., recruiting participants for more intensive intervention and longitudinal survey efforts as opposed to a one-time survey effort; see review by Pedersen & Kurz, 2016). For example, studies have reported Facebook advertising costs ranging from under \$2 per obtained participant (e.g., Ellis et al., 2012; Nelson et al., 2014; Thornton et al., 2016) to upwards of more than \$20–\$30 per participant (e.g., Antoun, Zhang, Conrad, & Schober, 2016; Fenner et al., 2012; Lohse & Wambolt, 2013). In some cases, Facebook may not be the most cost-effective strategy. For example, in a direct comparison between costs of advertisements on Facebook and Google and advertisements on Craigslist and Amazon's MTurk, the latter two were less expensive when recruiting smartphone users for a survey study; yet for Google specifically, the obtained sample more closely matched the target population of the study (Antoun et al., 2016). Although we used Facebook only for recruitment in the present study, the value of these other three sites to reach military spouses should be examined and studies directly comparing costs and length of recruitment time between websites would greatly add to the literature in this area.

A third lesson we learned was that creating an ad that was mobile-friendly was important because 9 out of 10 participants reported hearing about the study from ads on their phones. About three-quarters then went on to complete the baseline survey on their phones. Given this, it appears essential for studies using Facebook or other Internet advertisements to optimize recruitment materials, surveys, and interventions for ease of use on mobile phones.

Limitations should be noted. First, Facebook provides detailed reports about clicks on ads, but without the use of a tracking pixel embedded in HTML code, it does not allow for prediction of which clicks convert to actual engagements. That is, we do not know who among those that clicked on the ads completed the baseline survey or who engaged with the intervention. We decided against using a tracking pixel because of concerns that if we used one, participants might be hesitant to sign up for the study and such tracking would likely lead to institutional review board concerns. An additional limitation is that we relied on participant self-report both for participants' own demographics, but also for reports about whether their partner received care for drinking or emotional issues. We do not have data from the veterans and service members themselves to corroborate this, as they may have received care without the participant's knowledge. Last, though not a limitation per se but more an area for future research, we enrolled only four participants who reported they were in same sex partnerships. Although same-sex partnerships are somewhat rare in

military populations (Blosnich et al., 2013; Gates, 2010), the utility of Facebook to access the population of military spouses in non-heterosexual partnerships is an area for much further exploration.

In conclusion, the findings from this recruitment effort suggest that Facebook can be a viable and potentially cost-effective strategy to find and enroll military spouses into programmatic research efforts. Although Facebook was founded more than 12 years ago, the benefits of its use to locate hard-to-reach populations are not well understood. However, emerging research is suggesting that the site may be able to reach individuals who may have otherwise not sought behavioral health care (Pedersen & Kurz, 2016), which makes social media recruitment strategies promising public health resources.

Funding

The present study was funded by a grant from the National Institute on Alcohol Abuse and Alcoholism (1R34AA023123, Principal Investigator: Karen Chan Osilla).

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