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Contemporary Approaches to Recruitment of Postmenopausal for a Community-Based Study

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Abstract

Background: Few researchers have focused on the challenges of recruiting postmenopausal women for community-based research. Researchers have reported that multiple methods may be needed to recruit the required number of subjects. One contemporary approach to recruitment is use of Facebook. More studies are needed examining Facebook as a recruitment strategy.

Objectives: To examine which recruitment methods were most successful and cost-effective in recruiting postmenopausal women for a randomized controlled trial on bone loss.

Methods: Subjects were 276 postmenopausal women who had osteopenia and were within five years of menopause. Multiple methods were used to recruit women. To determine which methods were successful, women were asked how they learned about the study. Descriptive data were used to examine recruitment numbers as well as to determine the cost-effectiveness and enrollment efficiency of recruitment methods.

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The authors have no conflicts of interest to report.

Ethical Conduct of Research: The Institutional Review Board (IRB) at the University of Nebraska Medical Center approved all recruitment methods used in this R01 funded study. Written consent was obtained from participants at the time of screening and again at the time of enrollment using two separate documents.

Results: Health-care provider letters yielded the highest number of enrolled subjects ($n = 58$), followed by postcard mailings ($n = 47$), and Facebook posts ($n = 44$). Eleven subjects were referred by family and friends, 5 subjects from newspaper or television, and 2 from digital ads. Cost of recruitment per subject enrolled was highest with digital ads and postcard mailings.

Discussion: Recruitment could be more costly and time-consuming than anticipated. Recruitment using direct-targeted mailings, such as provider letters and postcards, were successful in our study and have been effective in previous studies reviewed. Facebook was successful for recruitment in our study and may continue to be useful for recruitment in the future, as the number of women accessing Facebook continues to increase.

Clinical Trial Registration: Trial registry: Heartland Osteoporosis Prevention Study

Trial number: NCT02186600

Date of registration: July 10, 2014

Date of first participant: February, 2015

Link: [ClinicalTrials.gov NCT02186600](https://clinicaltrials.gov/ct2/show/study/NCT02186600)

Keywords

post menopause; recruitment techniques; social networking

When planning research studies, researchers should not overlook potential difficulties recruiting subjects. Lack of success in subject accrual is a major reason clinical trials fail (Carter, et al., 2015); on average, at least 19% of clinical trials have been terminated or compromised due to inability to recruit subjects (Carlisle, Kimmelman, Ramsay & MacKinnon, 2015; Kapp, Peters, & Oliver, 2013). When studies fail because of low recruitment and enrollment, primary research questions are not answered and society does not benefit from new findings and discoveries (Anuruang, Davidson, Jackson & Hickman, 2015). Difficulties in subject accrual means a longer duration of recruitment periods and more costly studies. Typically, recruitment periods need to be extended by at least 27% because the majority of U.S. studies fail to recruit the required number of participants (Ott, Twiss, Waltman, Gross & Lindsey, 2006). Unfortunately, few articles have been published describing the challenges of recruiting, especially recruiting women for community-based studies (Butt, Lock & Harvey, 2010; Carter, et al., 2015). One contemporary approach to recruitment of women is use of Facebook or online social media. Women are increasingly participating in Facebook and thus, they are changing the way they are communicating with each other and hearing about health-related issues (Cowie & Gurney, 2018). Yet, many nurse researchers are unfamiliar with the use of online social media such as Facebook as a recruitment tool.

Objectives

The objectives of this report were: a) to examine to determine recruitment methods which were most successful and cost-effective in recruiting postmenopausal women for a randomized controlled trial to compare the effect of exercise and a pharmacologic intervention on bone health; and b) to describe advantages and disadvantages of using

Facebook as a contemporary approach to recruitment for this population and type of research.

Background

Selected Reports of Recruitment Methods

Findings related to recruitment from previous studies can help guide researchers who are recruiting for new studies. In their community-based study of Ott et al. (2006) reported that their two most successful recruitment methods were newspaper advertisements (ads) and information shared among family and friends, and the third most successful method was television interviews. They evaluated the effectiveness of various treatment modalities including exercises in preventing bone loss in postmenopausal breast cancer survivors (BCS). Of the 708 postmenopausal BCS screened, 249 women enrolled in the study.

Butt, et al. (2010) also found that newspaper ads were an effective recruitment strategy. They recruited 904 Canadian postmenopausal women for a randomized controlled trial (RCT) evaluating the effectiveness of gabapentin for treating hot flashes in women. Of the 904 women screened, providers had referred 3.8% of the women, 3.9% were from other referrals, 15.6% were from posters in health care and community sites, and 67.7% were from newspaper ads. Less than one percent of women were recruited from community presentations.

Recruitment success from more contemporary methods differ. Direct mailing of letters and postcards was the most effective recruitment strategy in studies conducted by Stewart et al, (2013), Bachour, et al. (2017), and Brown et al. (2016). Stewart et al. (2013) recruited non-obese men and women for an intervention study of sustained 25% caloric restriction. Of the 10,856 individuals who contacted study sites after being informed of the study, 218 were enrolled. Subjects were ages 21 to 50, 64% were White, and 62% had graduated from college. The most effective methods for recruitment were direct mailings, newspaper ads, and television. Community events, radio, and billboard ads were least effective. Direct mailing was the most effective recruitment strategy in the clinical trial of women with vulvodynia by Bachour, et al. (2017). Eight hundred sixty-eight women were screened for their study and 219 enrolled. Women in the study were an average age of 38 years. They were 66% African-American, 60% had less than a college education, and 67% had an income of less than \$50,000 annually. Direct mailing was especially successful in recruiting African-American women. Compared to White women, African-American women were 13 times more likely to respond to mailings.

Brown et al. (2016) also found that direct-targeted mailing was an effective recruitment strategy in their study examining the feasibility, safety, and physiologic effects of moderate-intensity exercises for colon cancer patients. Both men and women participated in the study, with an average age of 70 years; 76% were White. Names of potential subjects for mailings were obtained from a population-based state cancer registry.

In two recent studies, researchers evaluated the effectiveness of Facebook for recruiting subjects to health-related clinical trials. Jones, LaCroix, and Porcher (2017) used Facebook

to recruit at-risk, predominately African-American women for an HIV prevention study. Women were urban, younger aged, and were considered at high risk for HIV. Twice as many women were screened via Facebook ads compared to “on-the-ground” methods. Cowie and Gurney (2018) used Facebook ads to recruit healthy men and women for a Phase 1 clinical trial. A total of 621 people responded to the ads and 45 were enrolled after eight weeks of advertising. Although all subjects were at least 60 years of age, older subjects were more likely to respond to social media than those who were closer to age 60.

Use of Facebook and online recruitment for research is still a relatively new endeavor, and researchers may have questions about methodological issues. However, in the Jones et al. (2017) and Cowie and Gurney (2018) studies, researchers concluded that Facebook quickly and cost-effectively reached qualified candidates for recruitment and could be a supplement to traditional means of recruiting.

In all of the previous studies reported, few subjects were recruited from provider referrals, family and friend referrals, or from community presentations. However, in a recent study by Davis et al. (2018), researchers were successful in recruiting subjects using community presentations. The purpose of the study was to test interventions for promoting colorectal cancer screening. In their study, 560 subjects were evaluated, and 330 enrolled in the study. Their sample included African-American men and women and their average age was 56 years. Recruitment methods were categorized as active (community presentations and health fairs), passive (flyers and media presentations - radio, television, and newspapers), or snowball recruitment (subjects shared study information with family and friends). Community presentations and health fairs yielded the highest number of enrolled subjects, followed by media presentations and referrals from family and friends. While referrals from family and friends was a less successful recruitment method, most of the subjects with fewer years of education volunteered for the study after talking to family and friends.

None of the studies reviewed reported a significant number of subjects recruited from direct provider referrals. Foster, Sawyer, Smith, Reddel, and Underwood (2015) conducted a survey of health care providers who were not effective in recruiting chronic lung disease subjects for a study. Providers reported that their lack of success was due to time constraints, confusion about recruitment information, and lack of recruitment support from researchers.

A Guiding Principle in Choosing Methods

Recruitment methods in the reported studies appeared to differ in effectiveness among subject demographics including age, sex, race, and educational status. Thus, in planning recruitment for our study, we chose recruitment methods that would most likely reach the target population of women needed for our study (Braun, Kennedy, Sadler, & Dixon, 2015; Brown, Long, Gould, Weitz, & Milliken, 2000) Kapp, et al., 2013). Methods effective in reaching women in previous studies included direct mailings, newspaper and television ads, community presentations, information shared with family and friends, and Facebook. Facebook was also chosen as a recruitment method because it had been reported that two thirds of women who use the internet also use Facebook (Kapp, et al., 2013).

Recruitment using Facebook

Since 2004, the number of people in the United States (U.S.) and abroad using an online social media tool such as Facebook has increased substantially. At present, 62% of U.S. adults aged 50 to 64 are Facebook users, and adults average approximately 25 minutes on Facebook per day (Grimmelmann, 2009; Kapp, et al., 2013; Kosinski, Matz, Gosling, Popov, & Stillwell, 2016; Wilson, Gosling, & Graham, 2012). Facebook is popular with middle-aged and older women of all races, ethnicities, and economic levels, and is fast becoming a primary resource for users looking for health information (Bobrow, et al. 2016; Hale, Jethwani, Kandola, Saldana & Kvedar, 2016; Martín-Lesende et al. 2017; Ong et al. 2016).

Facebook members: a) post an online personal profile on an individualized profile page; b) link to other members and create a “friends” list; and c) interact with other members in selected networks (Wilson, et. al., 2012). Members communicate through a “message” system that allows for private communication and a “wall” system that allows for a more public form of communication (Grimmelmann, 2009). Users can join broad categories of networks, which include colleges, high schools, workplaces, or public entities such as health care networks (Lewis, Kaufman, & Christakis, 2008).

Several strategies can be used with Facebook to disseminate research study information. Recruiters can purchase an advertising platform on Facebook or can pay organizations to do a “boosted post” or advertisement on their Facebook pages. Boosted Facebook posts can be targeted to specific populations based on age, sex, race, ethnicity, and other demographic variables according to the needs of the study (Kosinski, et al., 2016). One strategy for recruiting participants through Facebook is the use of “snowball sampling, where those who receive a recruitment post “share” it with their followers.

A great deal of personal information about subjects is available on Facebook and recently there have been increased concerns about threats to the privacy of Facebook users about unauthorized access to personal health information. With Facebook, the boundary between data belonging solely to subjects and information available to the public can be vague. Many Facebook users do consent to participate in research studies. However, their consent does not grant researchers the right to use private information available on Facebook freely in their publications (Grimmelmann, 2009; Kapp, et al., 2013; Kosinski, et al., 2016; Wilson, et al., 2012).

When planning to use Facebook for recruitment, our team discussed information about privacy violations with Facebook that appeared in our readings and in current news reports. We decided not to view or collect any personal health information from Facebook for our study. We only used information that was provided by subjects when they completed our surveys; information collected was limited to data necessary to address study aims.

Methods

Trial Design

This report describes methods used in recruiting postmenopausal women for a federally funded randomized controlled trial recruiting postmenopausal women from the local

community. The goal of the study was to evaluate the best way to prevent further bone loss in women with osteopenia during the first five years post menopause. Only a brief description of this trial is reported here as a detailed protocol and proposed outcomes are published elsewhere (Bilek, et al., 2016). Women who enrolled in the study were randomized to one of three intervention groups. The control group received 12 months of calcium and vitamin D supplements only. A second group of women received supplements plus a bisphosphonate medication (risedronate group), and the third group received the supplements plus a three-time weekly structured bone-loading exercise program (exercise group). Outcomes for the study included bone mineral density (BMD), bone structure, and bone turnover measures. The study and all recruitment methods used were approved by the IRB at the University of Nebraska Medical Center (UNMC). Written consent was obtained from subjects at the time of enrollment using two separate documents.

Sample

Subject pool.—According to the U.S. Census Bureau, at the time of recruitment, there were over 56,000 women between the ages of 45 and 54 years old residing in Lincoln or Omaha, NE. Researchers have reported that approximately 33% of women between the ages of 45 and 54 are expected to have osteopenia (Waltman, et al., 2010). Thus, the subject pool for this study in Lincoln and Omaha, NE was more than 18,000 women, more than adequate for the study.

Inclusion and exclusion Criteria.—Women were included in the study if they were in their first five years post menopause, had a BMD T-score between -1.0 and -2.49 at the total hip or spine (osteopenic), were 19 years of age or older, and had their health care provider's permission. They were excluded from the study if their BMD T-score was less than -2.5 at the hip or spine (osteoporosis); if they had an increased rate for hip or other major fracture based on their Fracture Risk Assessment (FRAX) score; if they used bisphosphonates in the last six months; were currently on estrogen, tamoxifen, or aromatase inhibitors; weight was > 300 pounds; serum vitamin D was <10 ng/ml or >100 ng/m; and if subjects had any conditions that prohibited taking calcium and vitamin D supplements, the medication "risedronate", or participating in exercises.

Screening process.—Women interested in the study completed a prescreening questionnaire online and were further evaluated for eligibility during a phone contact interview. The prescreening questionnaire included an initial evaluation of inclusion/exclusion criteria and the Physical Activity Readiness Questionnaire (PARQ) (Blair, 1984). Women who met initial eligibility criteria obtained BMD testing to evaluate final eligibility. If women were osteopenic, they had additional laboratory (blood) testing. If all eligibility criteria were met, a letter was sent to the potential subject's provider requesting approval for her to be in the study. If provider approval was obtained and the subject signed the consent form for enrollment, she was randomly assigned to one of the three groups.

Sample size.—Power analysis showed that at least 275 subjects were needed for enrollment in this three-group, longitudinal, intervention study. The analysis was based on a small and conservative effect size of $f=.15$ for a repeated measures analysis of variance

assuming a significance level of .05, three time points and an estimate of 0.5 for the correlation between time points. A sample size of 275 across three groups would provide sufficient evidence to detect the effects of interest in this study (Guiliano & Polanowicz, 2008).

Recruitment Methods

Methods used were based on our review of past studies and on recruitment strategies that had been effective in reaching the target population of postmenopausal women. We planned to use multiple methods for recruitment including contemporary methods such as Facebook. We also planned to monitor methods frequently for effectiveness and to implement new methods as needed. Recruitment methods planned for the study included community events/presentations (especially when held in conjunction with ongoing corporate and community wellness programs), television and newspaper advertisements (ads), letters from health care providers, postcard mailings, digital ads, and Facebook posts.

Community events/presentations.—Our research team participated broadly in community-based recruitment activities, which included presentations at approximately 30 events. We hosted exhibitions at numerous conferences as well as presented seminars to community women's groups. We also presented seminars to health care providers and staff members at various outpatient health care clinics in the area.

Television/newspapers.—We participated in multiple television interviews. We purchased ads in newspapers and feature stories were written about our study in both the Omaha and Lincoln papers.

Health care provider letters.—A family practice physician and two internal medicine physicians affiliated with our partner hospital, Nebraska Medicine, agreed to send letters about the study on our behalf to their patients who might qualify. To identify potentially qualified persons, the electronic medical record at Nebraska Medicine was queried to identify female patients who were ages 49 to 62 years and residing within 50 miles of Omaha or Lincoln, NE. Women were excluded if they had a diagnosis of osteoporosis or if it was more than five years since their last clinic visit. Six hundred nine letters were mailed and provided general study information, subject qualifications, and our contact information.

In addition to letters from physicians at Nebraska Medicine, a physician at the Creighton University Osteoporosis Research Center (CORC) sent letters about the study to his patients. We had a collaborative relationship with CORC for BMD testing. Letters signed by the CORC physician were sent to 847 patients and letters were resent to women if they had not responded to the first mailing.

Postcard mailings.—Mailing lists were purchased four times during the study. These lists included women 45 to 60 with zip codes within a 50-mile radius of the Omaha and Lincoln metro areas. Postcards were mailed to 72,469 women over the length of the study and resent six months later.

Digital ads.—We implemented a digital ad campaign to advertise to our target population. Working with public relations at UNMC, we created web banners with connected consistent messages and clear images and this linked to our study website. We purchased 200,000 impressions to run in the Omaha and Lincoln, NE metro areas for three weeks. Impressions are online ads that appeared as our target population browsed the internet. The same digital ad campaign was repeated six weeks later. We also ran accompanying boosted Facebook posts with the same message and images.

Facebook.—All posts on the UNMC Facebook page’s timeline included the study website address and phone number. When interested users clicked on the UNMC Facebook post, it brought them to our study website, which included study information and the online prescreening questionnaire. To maximize the visibility of a post, we purchased “boosted” posts. These automatically appeared on the newsfeed of the target audience of women ages 45 to 60 within 50 miles of Omaha. We also “sponsored” or paid for Facebook advertisements through our local health care system (UNMC) Facebook account and through the Facebook site of several local organizations including area newspapers. To continue to spread the word about our study, we emailed all the current study participants and invited them to share the Facebook posts or ads with friends.

Monitoring Results of Recruitment

Each week, our project coordinator provided team members with the number of screening and enrollment visits for the last week. Effectiveness of recruitment methods were discussed at biweekly and monthly team meetings. Recruitment activities that were successful were continued and increased in number. Less successful activities were discontinued or used less often.

Data Analysis

Descriptive data (percentages, frequencies, tables, and linear graphs) were used to describe recruitment rates for every four months of the recruitment period, recruitment and enrollment numbers, and cost-effectiveness and enrollment efficiency for each of the recruitment methods. “Recruitment” numbers were defined as the number of potential subjects who completed the prescreening questionnaires. Numbers of women recruited using each method were determined by subjects’ responses on their online prescreening qualification questionnaire. In the questionnaire, subjects were asked how they had heard about this study. Recruitment numbers from Facebook and digital ads were verified by tracking the number of women completing prescreening questionnaires on our website following our Facebook and digital ad posts.

Results

Final Recruitment and Enrollment Numbers

Figure 1 shows the number of women recruited, screened, and enrolled in the study, the number of women who were excluded during screening, and the number of women randomized to each study group. Of the 3,033 women who completed the pre-screening process, 276 were enrolled. Only 887 of the 3,033 women met initial eligibility criteria at

the time of prescreening and agreed to be screened with BMD testing and blood work. Thirty-one percent of the women who obtained BMD and laboratory testing were enrolled in the study ($N = 276$).

Reasons for Non-participation

After initial screening, 2,146 of the 3,033 women who completed prescreening questionnaires were excluded or chose not to continue with testing. Major reasons for exclusion were: not within five years post menopause (17.6 %); currently taking medications that excluded them from the study (8.8 %); medical condition or disability that prevented participation in one or more of the study interventions (6.6%); or, after hearing more about the study they decided not to continue participating (10.9%).

Only 887 women of the 3,033 recruited were screened with BMD and laboratory testing. After BMD and laboratory testing, 276 of the 887 women agreed to enroll in the study. Major reasons for exclusion of the 611 women who had BMD testing were that they were not osteopenic (58.0%), had high FRAX scores (1.5%), had laboratory values outside of the normal range (3.9%), or their providers would not grant permission for women to be in the study (0.3%). In addition, after completion of screening, some subjects who met all study criteria still decided against enrolling (3.0%).

Characteristics of Subjects Enrolled in the Study

The average age for the 276 enrolled subjects was 54.4 years. Subjects were 89.1% White, 9.1% Hispanic, and 1.8% African-American. Most subjects had a greater than high school education (95.7%), were married (75%), and had a family history of osteoporosis (58.7%). The most common occupations of the women were teacher (13.0%), nurse (12.2%), or other health care professional (6.9%). Thirteen percent of the women reported they were homemakers or retired.

Recruitment Rates per Month of Study

Screening and enrollment of subjects occurred between November 2014 and May 2018. Time for recruitment was 44 months, 4 months longer than the 40 months that had been allotted for recruitment. Early in the study, we presented at seminars and recruited at health fairs; recruitment numbers per month were minimal. However, our recruitment numbers improved greatly during year two of the recruitment period. The first mailings of postcards and physician letters occurred in July 2015, resulting in a 237% increase in screening and a 380% increase in enrollment from the prior quarter. The first boosted Facebook post occurred in March 2017 and resulted in a considerable increase in screening. Thus, there were sizable increases in recruitment numbers in the months following postcard and letter mailings and Facebook posts. Recruitment numbers for every four months of the recruitment period are shown in Figure 2.

Enrollment Efficiency

Provider letters accounted for the highest number of enrolled subjects, followed by postcard mailings, and Facebook posts. More subjects were recruited from Facebook (completed prescreening questionnaires) than from any other method. However, many of the subjects

recruited did not meet the study criteria and could not be enrolled in the study. Eleven subjects who enrolled in the study were referred by family and friends. Newspaper ads and television had the lowest enrollment efficiency numbers. No enrolled subjects were recruited from community events. Enrollment efficiency for each recruitment method are shown in Table 1.

Cost-effectiveness of Recruitment Methods

Cost of recruitment per subject enrolled was highest with digital ads and postcard mailings and lowest with community events and referrals from friends and family. Presentations at community events cost very little. However, presentations were time-consuming. Table 2 shows the cost-effectiveness of recruitment methods. Advantages and disadvantages of recruitment methods used are found in Table 3.

Discussion

Recruitment for our study was more costly and time consuming than we anticipated. This was consistent with findings from other studies that time and resources for recruitment were underestimated. Researchers may want to keep recruitment time and costs in mind when planning timelines and budgets for new studies.

We think that recruitment was especially difficult in our study because of our strict criteria for subject enrollment (must be osteopenic and within five years of menopause). Additionally, some subjects were reluctant to participate in a clinical study that could involve either medications or exercises. Researchers have found that recruiting postmenopausal women for exercise studies can be especially difficult (Waltman, et al. 2010). Exercises can be time-consuming and require travel to fitness centers. According to the National Center for Health Statistics (2017), only 20% of women between the ages of 25 and 64 adhere to physical activity guidelines for both aerobic and muscle-strengthening exercises.

Our most cost-effective strategy for recruitment was mailing letters to potential subjects that had been signed by their providers and targeted to a selected group of their patients. In the literature review, providers reported that they were not recruiting for studies because they did not have the time during patients' clinical visits. In our study, research team members prepared and posted recruitment letters, allowing providers to have more clinical time with their patients. Providers did agree to have their signatures used in letters and to allow us access to their patients. We believed that by mailing postcards to all women in specific age groups and zip codes, we would be more likely to recruit a sample representative of the population of women in the area. Postcards were sent twice to 72,469 women. However, printing and postage for this number of mailings was costly. This cost would be a concern for researchers with a limited budget.

Use of Facebook was also a successful recruitment method in our study and was less costly than postcard mailings. However, researchers should examine concerns about privacy issues when considering use of Facebook for recruitment, and should implement safeguards protecting their subjects' privacy. Researchers are now required to obtain approval from their

Institutional Review Board (IRB) prior to using Facebook for recruitment. In addition, IRBs, the U.S. Department of Health and Human Services, and a variety of other ethics committees are in the process of reviewing standards for use of technologies such as Facebook as research tools (Kosinski, et al., 2016). In reports of studies using Facebook data, researchers should include a discussion of ethical decisions on use of Facebook in the design of the study and in the publication of study findings (Grimmelmann, 2009; Kapp, et al., 2013; Kosinski, et al., 2016; Wilson, et al., 2012).

Referrals by friends and family, television interviews, and newspaper ads were also somewhat useful for recruitment and were less costly than mailings. Implications are that multiple recruitment methods may be necessary to obtain the number of subjects required for a study. Through community events (seminars and networking at conferences), we were able to inform women in the community about the magnitude of bone loss and the potential complications when bone loss occurs. We were also able to provide awareness of ongoing community research studies and to improve trust and credibility for research studies. We envisioned community events as being one of our primary resources for recruitment. Unfortunately, participating in these events did not result in any recruitment or enrollment of subjects.

Study limitations

Over 600 of the 3,033 women who participated in the study did not report where they learned about it. These missing data limit findings on effectiveness of specific recruitment methods. Contact hours and time spent on all recruitment methods were not systematically recorded. Thus, we were unable to determine cost of staff time associated with each method. Another limitation was that some subjects might have decided to enroll in the study after being exposed to several recruitment methods. For example, subjects may have attended a community presentation but did not volunteer for the study until they received a postcard through the mail. This possibility supports the use of various approaches to recruitment. The women recruited for our study (89% White, highly educated, and likely to have a family history of osteoporosis) were not representative of the majority of U.S women, and recruitment methods may differ based on the targeted population. Our findings may not be generalizable to other populations of women.

Conclusions

Recruitment methods that were reported to be effective in past studies such as direct mailings (provider letters and postcards) and Facebook were also effective in our study. The number of middle-aged women who use Facebook continues to increase. Thus, researchers conducting future studies may consider use of Facebook for recruitment. With thoughtful planning for recruitment, using recruitment methods most likely to reach the population of interest and frequent monitoring of success of recruitment methods, researchers should be able to overcome one of the greatest challenges in implementing clinical trials. This is the challenge of successfully recruiting and enrolling the required number of subjects within the allotted time.

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Figure 1.
Flow Chart for Recruitment and Enrollment

Figure 2.
Recruitment Rate of Subjects over Time ($N=3033$)

Table 1

Enrollment Efficiency of Recruitment Methods

Recruitment Method	Number of Subjects Recruited (<i>N</i> = 3033)	Number of Subjects Enrolled (<i>N</i> = 276)	Enrollment Efficiency*
Provider Letter	498	58	11.6%
Postcards	489	47	9.6%
Facebook Posts	838	44	5.2%
Newspaper / Television	358	5	1.4%
Digital advertisements	38	2	5.2%
Community Events	13	0	
Friends / Family	142	11	7.7%
Unknown	657	109	16.7%

Note.

* Enrollment efficiency = # enrolled / # recruited × 100

Table 2**Cost/Effectiveness of Recruitment^a**

Recruitment^b Method	Number of Subjects Recruited (N = 3033)	Number of Subjects Enrolled (N = 276)	Total Cost of Each Recruitment Method (\$)	Cost per Subject Enrolled (\$)
Provider letter	498	58	1703.00	29.36
Postcards	489	47	43,567.49	926.96
Facebook posts	838	44	5,252.83	119.38
Newspaper advertisements or Television interviews	358	5	1,650.63	330.12
Digital advertisements	38	2	2,000	1,000
Community events	13	0	0	-
Friends/Family	142	11	0	0
Unknown	657	109	-----	-----

Note.

^aCost of researcher's time in implementing recruitment methods not considered in calculations.^b"Recruitment" defined as subjects who completed prescreening questionnaire. "Enrolled" defined as subjects who signed enrollment consent and were randomized to intervention group

Table 3**Recruitment Methods and Lessons Learned**

Recruitment Method	Advantages	Disadvantages
Health Care Provider Letters	Moderately low cost Large number recruited & enrolled Does not require provider to use clinical time for recruitment	Requires provider support Access to subjects limited to provider's case load of patients
Postcards	Large number recruited & enrolled More likely to recruit random / representative sample	High cost of printing and postage for large number of mailings
Facebook Posts	Large number recruited & enrolled May have great potential for future recruitment in studies Number of women using Facebook continues to increase	Moderately high cost
Newspaper Advertisements / Television (TV) Interviews	Useful for providing valuable health information to local community	TV interviews labor intensive Newspaper moderately high cost Few subjects recruited or enrolled
Digital Advertisements	May have potential for future recruitment in studies	High cost Few subjects recruited or enrolled
Community Events	Low cost Useful for providing valuable health information to local community	Labor intensive No subjects recruited or enrolled
Referrals from Friends /Family	Low cost	Few subjects recruited or enrolled