

Recruiting Phobic Research Subjects: Effectiveness and Cost

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Efficiently enrolling subjects is one of the most important and difficult aspects of a clinical trial. This prospective study evaluated strategies used in the recruitment of 144 dental injection phobics for a clinical trial evaluating the effectiveness of combining alprazolam with exposure therapy. Three types of recruitment strategies were evaluated: paid advertising, free publicity, and professional referral. Sixty-three percent of subjects were enrolled using paid advertising (the majority of them from bus advertisements [27.0%], posters on the University of Washington campus [20.1%], and newspaper advertisements [13.2%]). Free publicity (eg, television coverage, word of mouth) yielded 18.8% of enrolled subjects and professional referrals 14.6% of subjects. The average cost (1996 dollars) of enrolling 1 subject was \$79. Bus and poster advertising attracted more initial contacts and yielded the greatest enrollment.

Key Words: Alprazolam; Clinical trials; Dental anxiety; Subject recruitment.

The importance of evidence-based practice has resulted in increasing reliance on clinical trials. A critical aspect of clinical trials is subject recruitment. The tendency to be avoidant makes the anxious population particularly difficult to recruit for studies and increases their time and budget. We were in the situation of having to recruit for a randomized clinical trial studying possible benefits of combining alprazolam with exposure therapy in the treatment of dental injection phobia. Bielski and Lydiard¹ surveyed 18 investigators who had conducted studies testing psychotropic agents. The majority of subjects were recruited through newspaper advertising. The advertising budget ranged from \$20,000 to \$280,753, and the recruitment cost per subject varied from \$83 to \$1586. However, few studies have examined recruitment issues for trials involving dental treatment.^{2,3}

The purpose of this prospective study was to evaluate

the recruitment process, advertisement strategies, and costs of recruitment advertising for a large clinical trial. The goal was to identify the recruitment sources that were the most effective in recruiting subjects with dental injection phobia. We hypothesized that methods that offer frequent reminders, such as posters, would be most effective.

METHODS

Sample

The recruitment goal was 180 subjects with specific phobia of dental injections according to the criteria of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV).⁴ The initial expectations were not met. After 3 years, 108 subjects were enrolled and the goal revised downward to 144. Exclusion criteria were (1) obesity, (2) too young/old, (3) drug contraindications, (4) severe untreated depression or bipolar disorder, (6) unreliable (did not appear for a screening twice), or (7) could not be contacted after repeated efforts. The 911 subjects described include those who responded to

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Figure 1. An example of the bus advertisement used to recruit research subjects.

recruitment during 45 months of advertising and recruiting.

Advertising Strategy

Multiple methods were used simultaneously. Paid advertising, free publicity, and professional referrals were used. Success was reviewed in weekly meetings. The Institutional Review Board of the University of Washington reviewed the advertisements.

Paid advertisements appeared on radio and in newspapers, buses, and on posters on the campus. Advertisements emphasized that participants would receive free therapy. To minimize calls from those only seeking money, the financial incentives were not mentioned in advertisements.

The radio advertisement was 1 minute long and was broadcast 7 times during 3 days on 1 station. It contained a description of the study, an offer of free therapy, and contact information. Information about the study was also delivered in public service announcements (PSAs) based on information from a medical news press release from the University. PSAs were broadcast at the initiation of recruitment and 2 years later. Both announcements were 30 seconds long and followed the style of the paid advertisement. For analyses, subjects recruited using both paid radio advertising and PSAs were combined.

Community newspapers, campus newspapers, major metropolitan daily newspapers and magazines, and free published weekly newspapers were employed. The campaign was continued throughout the recruitment period. To attract attention, the headline was varied. The advertisement was placed in both editorial and classified sections. It included a description of subjects needed, a mention about new therapy, an offer of free therapy, and contact information. Some newspapers also published a news story along with the advertisement. These

stories included an interview with a subject from the market area, an interview with a researcher, general information about dental fear, and details about the study as well as contact information. The size of the advertisement varied from 1 × 2 inches and 2.5 × 5 inches. For analyses, subjects recruited from newspapers were combined.

Posters were used to advertise at the University. The 8.5 × 11-inch posters were placed in approximately 100 locations. Posters included a brief explanation of the study, an offer of free therapy, and contact information. Each poster also included a cartoon to attract attention. The color and style of the posters were changed periodically. Posters included tear-off telephone reminder slips. Posters were changed frequently and continued throughout the recruitment period.

Posters were also used on bus interiors. These posters were similar to those used on campus but were larger (11 × 33 inch) and were placed on different routes in Seattle and its suburbs (Figure 1). A 3 × 4-inch tear-off pad with the study phone number was attached to each poster. Bus advertising was conducted 4 times during the recruitment process. The bus company guaranteed placement of the posters for 4 weeks, but posters often remained in place up to a year.

The University has a weekend Health Sciences Open House every other year. This study was presented at the Open House event in 1997, and a member of the research group was available to answer questions.

Three television stations contacted the researchers after seeing a university news release. The stations prepared stories 4 times. The 2-3-minute stories were each broadcast once in the morning in a news magazine program and 3 times during the local evening news. Each included an interview with a patient, a description of dental injection fear, and an interview with a researcher. The researchers were also contacted by a company selling television news stories through the Internet (*Ivanhoe*

Broadcast News). The company has an Internet page where it advertises stories about medical breakthroughs. It published a cover story about the research. The story contained a brief explanation of the study, interviews with a subject and researcher, photographs of the study setting, and contact information.

Some recruits reported getting information about the study from a friend, relative, or from some other person. In these cases, the information about the study was delivered by word of mouth, and this was considered to be the primary method of the enrollment.

Professional Referrals

The dental and medical community was informed of the study by placing advertisements in professional association newsletters. The advertisement included an explanation of the study and the need for subjects. These advertisements were placed in the early stages of the study. The Dental Fears Research Clinic at the University also was a referral source. Subjects who had participated in other studies done in the Clinic were also informed about the study.

Procedure

A study coordinator was responsible for initial telephone screening and scheduling. The following information was collected during the initial screening: (1) name, (2) date, (3) telephone number and address, and (4) level of interest. Each caller was also asked to identify the source of his or her information about the study. Some subjects mentioned several sources. In that case, the first source each subject mentioned was considered the primary source. Following this, the study protocol and critical inclusion criteria were explained. Subjects interested in participating were sent a brochure and a questionnaire designed to characterize subjects. A 10-minute videotape explaining the study was also sent during the first year of recruitment. This was discontinued because of the costs (prospective subjects did not return the tapes) and the estimated benefits were considered low (eg, material in the video could be covered more succinctly over the phone).

Subjects who returned the questionnaire were contacted again and scheduled for screening. At the screening, the study was explained again and the consent form reviewed. Potential subjects were asked to sign the consent form. The screening appointment also included a medical history and an interview with a psychologist using the Structured Clinical Interview (SCID) for DSM-IV.⁵⁻⁷ A diagnosis of specific phobia for dental injections was made based on the SCID and interview. If prospective subjects were accepted and agreed to participate,

they were enrolled. The enrolled subjects were randomized to study conditions, and each was asked to continue therapy until he/she was able to receive a dental injection at 2 consecutive appointments or withdrew. Subjects were paid \$150 at completion.

Costs

The original recruitment budget approved by the NIH study section was \$17,000 (\$94.44/subject). The budget was cut administratively by NIDCR to \$12,805 (\$71.14/subject). The cost estimate for the videotape was \$2300. Therefore, the remaining budget was \$10,505 (\$58.36/subject). The direct cost of advertising using each method was recorded for each year over 45 months (January 1996–September 1999) and expressed as 1996 dollars using the Consumer Price Index for the Seattle–Tacoma area for the appropriate year as a deflator. Staff time spent designing advertisements and the costs of copying and mailing the questionnaires was not collected.

Data Analyses

Descriptive statistics were obtained using the Statistical Package for the Social Sciences. Contingency table analysis (χ^2 , Pearson) was used to investigate the number of subjects in each phase of the recruitment process and the race, education level, and gender of subjects enrolled using different recruitment sources and methods. The Student *t* test was used to compare the average age of subjects enrolled by recruitment source and method.

RESULTS

Recruitment Outcomes

A total of 911 people contacted the study coordinator. From these initial contacts, 186 (20.4%) were not interested in a study, 165 (18.1%) were rejected (78 during the telephone interview and 87 later), and 530 (58.2%) expressed interest in the study and appeared qualified. Thirty individuals (3.3%) called because they wanted to refer someone else. The frequency of initial contacts, subjects' interest, rejected recruits, and subjects calling for others are presented in Table 1 for each recruitment method. Of 619 subjects who received the study material, 290 returned the study questionnaire. Two hundred prospective subjects were interviewed, with 166 accepted for participation. Twenty-two subjects (2.4%) withdrew during the study and needed to be replaced. However, only 9 of these 22 subjects actually took the study drug and actually started the study

Table 1. The Initial Recruitment Outcomes by Recruitment Method

<i>Recruitment Method</i>	<i>Initial Contacts (N = 911)</i>	<i>Interested in Study (N = 530)</i>	<i>Rejected (Phone N = 78, Screening N = 87; N = 165)</i>	<i>Not Interested in Study (N = 186)</i>	<i>Referring Others (N = 30)</i>
Paid advertising					
Bus advertisement	273	182	41	43	7
Open house	1	1	0	0	0
Newspaper	129	65	34	25	5
Campus poster	148	94	29	19	6
Radio	18	9	4	2	3
Free publicity					
Internet	3	3	0	0	0
TV	57	29	14	11	3
Word of mouth	78	56	15	5	2
Professional referral					
Fears clinic	40	30	6	3	1
Previous research project	10	8	2	0	0
Professional referral	16	8	6	2	0
Unknown	138	45	14	76	3

before withdrawing. One hundred forty-four subjects were enrolled for the study, which is 20.7% of the 695 subjects (530 interested ones and 165 rejected ones) who were interested in participating in the study. Similarly, 23.3% of 617 subjects who received the study materials (the questionnaire and the brochure) and 72.0% of screened subjects were enrolled. Of 911 prospective subjects who initially contacted the research coordinator, 15.8% (144/911) were enrolled.

Paid advertising yielded the majority of the 144 enrolled subjects (63.2%, 91/144). The most effective methods using paid advertising were bus advertisements

(42.9%, 39/91), posters on the campus (31.9%, 29/91), and newspaper advertisements (20.9%, 19/91). The percentages of the enrollees recruited using free publicity and professional referral were 18.8% (27/144) and 14.6% (21/144), respectively. From the total population, 4.6% reported hearing about the study from 2 sources and 1.2% of the prospective enrollees reported 3 sources. The enrollment was more successful during winter and fall quarters than during summer and spring quarters. Recruitment outcomes are shown in Table 2.

Sixty-four percent of 144 subjects (92/144) enrolled were female. The age of enrollees ranged from 18 to

Table 2. The Final Recruitment Outcomes by Recruitment Method

<i>Recruitment Method</i>	<i>Sent study materials (%) (N = 617)</i>	<i>Returned questionnaire (%) (N = 290)</i>	<i>Interviewed for study (%) (N = 200)</i>	<i>Accepted into study (%) (N = 166)</i>	<i>Participated (%) (N = 144)</i>
Paid advertising					
Bus advertisement	213 (34.4)	102 (35.2)	53 (26.5)	45 (27.1)	39 (27.1)
Open house	1 (0.2)	1 (0.2)	1 (0.5)	1 (0.6)	1 (0.7)
Newspaper	81 (13.1)	33 (11.4)	28 (14.0)	20 (12.0)	19 (13.2)
Campus poster	112 (18.1)	54 (18.6)	44 (22.0)	35 (21.1)	29 (20.1)
Radio	9 (1.5)	4 (0.6)	3 (1.5)	3 (1.8)	3 (2.1)
Free publicity					
Internet	3 (0.5)	2 (0.7)	2 (1.0)	2 (1.2)	2 (1.4)
TV	33 (5.3)	16 (5.5)	12 (6.0)	11 (6.6)	8 (5.6)
Word of mouth	65 (10.5)	32 (11.0)	23 (11.5)	19 (11.4)	17 (11.8)
Professional referral					
Fears clinic	34 (5.5)	20 (6.9)	16 (8.0)	15 (9.0)	12 (8.3)
Previous research project	10 (1.6)	6 (2.1)	6 (3.0)	5 (3.0)	5 (3.5)
Professional referral	10 (1.6)	6 (2.1)	5 (2.5)	4 (2.4)	4 (2.8)
Unknown	46 (7.5)	14 (4.8)	7 (3.5)	6 (3.6)	5 (3.5)

Table 3. The Costs of Advertising (1996 dollars)

Method	Enrolled/contacts	Total Costs per Method (\$)	Total Cost per Initial Contact (\$)	Total Cost per Each Subject Enrolled (\$)
Bus advertisement	39/273	5536	26	142
Newspaper	19/129	4261	33	224
Campus poster	29/148	1203	8	41
Radio	3/18	458	25	153
Professional referral	4/16	25	2	6

66 years (mean 37 years). Fifty-five percent (79/144) had completed some college, 45.8% (66/144) had completed college, and 9.7% (14/144) had a graduate degree. The majority (73.4%, 105/143) were white and 21.7% (31/143) were African-Americans. The remaining subjects represented diverse racial backgrounds.

Women were more often enrolled through paid advertising and free publicity sources. Fifty-one of 91 subjects (56.0%) enrolled using paid advertising and 23 of 27 subjects (85.2%) enrolled using free publicity methods were women ($\chi^2 = 4.0$, $P < .05$; $\chi^2 = 6.7$, $P < .01$, respectively). Equivalent numbers of men and women were enrolled through professional referral. In general, the level of education did not differ by recruitment method or source. However, posters were placed primarily on the campus and thus a greater proportion of the subjects who were enrolled using posters had completed college or had a graduate degree (69.0%) ($\chi^2 = 9.2$, $P < .002$). Thirteen of 39 (33.3%) subjects enrolled through bus advertisements had completed college or had a graduate degree ($\chi^2 = 3.7$, $P < .05$). Subjects enrolled using bus advertisement were slightly older (40.6 ± 10.8 years) than subjects recruited using other methods (34.9 ± 12.2 years, $t(135) = -2.6$, $P < .01$).

The majority of African-Americans (82.8%) were recruited using paid advertising, while 64.3% of whites were recruited using these methods ($\chi^2 = 3.5$, $P < .06$). Of African-American participants, 53.3% (16/30) were recruited through bus advertisements, 6 were enrolled through newspaper advertisement, 2 using campus posters, 4 using professional referral methods, and 2 through free publicity. The proportion of whites (20.0%, 20/100) enrolled through bus advertisements was significantly lower than African-Americans (53.3%, 16/30, $\chi^2 = 13.8$, $P < .0002$). However, the multiple routes of advertising increased the overall diversity of the subject population.

Cost of Advertising

The newspaper advertising ranged from \$25 to \$369 (1996 dollars) depending on the newspaper and the size of the ad. Bus advertisements ranged from \$450 to

\$1559 depending on the number of buses in each campaign. The cost of poster advertising was estimated as man-hours spent by student staff in copying and placing posters around the campus. Approximately 4 hours were spent monthly for this at \$7 per hour. TV, Internet, open house, previous research projects, and word of mouth involved minimal costs. Except for 1 journal, the advertising in professional journals was free. The total cost of advertising for each method used and the advertising costs per individual subject enrolled are given in Table 3. The average cost per subject enrolled was \$79 (\$11,483/144 subjects enrolled).

DISCUSSION

Spilker and Cramer⁸ examined recruitment data from a number of medical trials and found the screening yield depends on the type of trial and subject population sought, ranging from 1 to 6% in prevention trials to 20 to 27% in therapeutic trials. Similar results have been reported in the psychology literature for psychotropic drug trials.¹ However, the range was between 5 and 90%, with about half the investigators reporting less than a 15% enrollment rate from initial contacts. Our recruitment yield (15.9%) is thus similar to other studies recruiting patients with psychiatric conditions.

Bielski and Lydiard¹ also reported that advertising resulted in 87% of all enrollment. The most common method was newspaper advertisement that was usually complemented with TV and radio advertising.

Paid print advertising in our study was most successful (63%). Including TV and Internet advertising, the yield through advertisement was approximately 70% of enrolled subjects. The bus advertisements attracted the greatest number of initial contacts and the largest number of enrollees. Second best were posters and third were newspapers. The advantage of bus advertisement and posters is that people see them daily. Frequent reminders seem to be important for anxious people. Posters, which were inexpensive, yielded 29 subjects. From other sources, such as television and radio, information about the study is delivered quickly and thus potential participants do not have the benefit of repeated expo-

sure to the recruitment message. To be effective, these sources must be used frequently, demanding a large advertisement budget. Professional referral was not a very effective method in the present study, producing only 16 enrollees, probably because anxious patients avoid dental care.

In this study, an average of \$79 (1996 dollars) was spent to enroll a subject. This rate is much lower than the \$535 average advertising investment reported in an article comparing recruitment strategies in 18 therapeutic trials.¹ The main strategy in the cited studies was newspaper advertisement. Our cost per enrolled subject (inflated to current dollars) could be used as a minimal guideline when making a budget for recruitment advertising. Staff time spent during screening and designing advertisements and indirect costs were not included. Also, unsuccessful methods were dropped during the monitoring meetings. Thus, total recruitment costs may be underestimated.

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