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Cost Effectiveness of Strategies for Recruiting Low-Income Families for Behavioral Parent Training

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Abstract

The goal of this study was to assess cost, effectiveness, and cost-effectiveness of recruitment strategies used to engage low-income families of young children with disruptive behavior disorder to participate in a Behavioral Parent Training (BPT) program. For this analysis, we used data on labor and non-labor resources associated with 13 recruitment strategies implemented in February 2014 through February 2016. We assessed the effectiveness of each strategy as the number of families that enrolled into the study. Cost-effectiveness of each recruitment strategy was expressed as cost per family enrolled; analysis was conducted in 2016. We calculated the cost of total recruitment effort for 13 strategies during the 2-year period to be \$11,496 with an average cost of \$885 per recruitment strategy or \$255 per enrolled family. Across strategies, total costs ranged from \$25 to \$2,540. “University mass e-mail” and “school flyers” resulted in the most phone screens (34 each); however, only 10% of these families enrolled in the study (3 and 4 families, respectively). “Craigslist” was the most effective strategy with 30 families screened and 11 of them enrolling. Three strategies did not yield any participants. The four strategies with the lowest cost per family enrolled were “Facebook page,” “Craigslist,” “university mass e-mail,” and “organization/agency” (< \$90). In conclusion, we found that some recruitment strategies were more successful at engaging low-income families to participate in a BPT program than others. Our results indicate that using a combination of recruitment strategies may be the optimal approach for recruiting low-income families.

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Author Contributions

All co-authors contributed substantively to the research questions, hypotheses, and writing of the manuscript. In addition, OAK developed and implemented the cost data collection approach and assisted with the data analyses and interpretation; PT completed data management and analyses; and DJJ is principal investigator of the parent study upon which this study is based.

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

This article does not contain any studies with animals performed by any of the authors. University of North Carolina at Chapel Hill provided IRB approval for the study.

Informed consent: Informed consent was obtained from all individual participants included in the study.

Compliance with Ethical Standards:

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Keywords

behavioral parent training; disruptive behavior disorder; recruitment strategies; cost-effectiveness

INTRODUCTION

Federal initiatives and policies have recently given increased attention to engaging at-risk and underserved populations in evidence-based health care. For example, the Patient Protection and Affordable Care Act (PPACA), which aims to transform health care by reducing costs; increasing access; and, in turn, improving health outcomes regardless of income, defines mental health care as an “essential benefit.” Moreover, funding agencies, such as the National Institute of Mental Health (NIMH, 2016), have identified research on health disparities based on demographics as “essential to the development of precision medicine and personalized interventions.” In turn, policy groups, such as the American Psychological Association (APA, 2016), have created offices to “develop and facilitate relationships and activities to advance psychology as a major force in research, policy and advocacy related to SES,” or socioeconomic status, which is typically defined as a combination of income and education. Such efforts are perhaps nowhere more important than those initiatives targeting the health and well-being of our nation’s low-income children.

Economic declines in the late 2000s have led to a higher number of people in the United States living in poverty, and children have been especially vulnerable. In 2011–2015, approximately 32.4 million (45% to 51%) children younger than age 18 lived in low-income homes (Addy, Anglehart, & Skinner, 2013; Jiang, Ekono, & Skinner, 2016; Southern Education Foundation, 2015). Family Stress Theory highlights the role of such financial strain on the psychosocial well-being of youth, with a primary focus on associated parental stress and compromises in parenting (Conger & Donnellan, 2007). The impact of family stress in the context of economic strain is, in turn, evident in statistics on child mental health. Indeed, while approximately one-fourth (26%) of children in the general population experience psychopathology, rates are as high as 40% in low-income communities (Costello, Egger, & Angold, 2005; Gopalan et al., 2010; Xue, Leventhal, Brooks-Gunn, & Earls, 2005).

For example, low-income children are more likely to experience early- or childhood-onset (3 to 8 years old) behavior disorders (BDs), including Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD), both of which co-occur with Attention Deficit Hyperactivity Disorder (ADHD) as well as depression and anxiety (August, Realmuto, MacDonald, Nugent, & Crosby, 1996; Larson, Russ, Kahn, & Halfon, 2011; Merikangas, Nakamura, & Kessler, 2009). The etiology of early-onset BDs focuses on the coercive cycle of parent-child interaction [e.g., Bridging Model (Shaw & Bell, 1993), Cascade Model (Dodge et al., 2009), Early Onset Type (Moffitt et al., 2008)], which is targeted in the gold-standard evidence-based approach to treatment of those youth (Forehand, Jones, & Parent, 2013; Kaehler, Jacobs, & Jones, 2016; Reitman & McMahon, 2012). Although BPT programs have a rich history and robust evidence base, they have been shown to be less effective at

engaging families that may benefit the most from these programs, including low-income families (Chorpita et al., 2011; Gardner et al., 2009; Jones et al., 2013). Indeed, it is posited that the same family stressors that challenge parenting in low income families limit family engagement in and, in turn, the capacity to benefit from BPT (Eyberg, Nelson, & Boggs, 2008; Leijten, Raaijmakers, de Castro, & Matthys, 2013; Thomas & Zimmer-Gembeck, 2007).

Thus, understanding the effectiveness of strategies to reach and engage low income families in BPT services is critical to the health and well-being of this vulnerable population. To our knowledge, relatively little information has been published on the effectiveness of the various recruitment strategies to engage low-income families in mental health services in general or BPT in particular, and even less is known about the cost-effectiveness of these strategies (Jones et al., 2016). In one notable exception, Schnirer and Stack-Cutler (2012) surveyed 65 researchers in Canada (52%), the United States (46%), and outside of North America (2%) to report on their frequency of use of a range of recruitment strategies with low-income families and the effectiveness of each strategy. On average, the five most common recruitment strategies were (1) word of mouth, (2) government or agency referrals, (3) community flyers, (4) community events, and (5) information sharing at interagency meetings. The five strategies that investigators perceived to be most effective were (1) word of mouth, (2) elders and community leaders, (3) door-to-door, (4) phone calls, and (5) community events. Yet, the term “effective” must be used with caution, given that only one third of studies targeting low-income families reached their target sample size within the planned timeline. As a result, many investigators were forced to revise their recruitment plans and timelines, and in some cases even terminate the studies completely.

Mendez-Luck et al. (2011) took this work a step further by conducting a retrospective analysis of recruitment strategies and costs for two studies that assessed caregiving constructs among low-income women ($N = 154$) of Mexican descent in Los Angeles, California. Various recruitment strategies were used (e.g., flyers, word of mouth, health fairs, agency partnerships), and labor and non-labor costs were reported for the overall recruitment effort (rather than for each specific strategy) as \$1,081 per participant for the first study and \$298 per participant for the second study. The higher per participant cost in the first study was likely a result of more targeted one-on-one recruitment strategies (e.g., face-to-face contact with potential participants on street corners, bus stops) relative to the second study, which focused on recruitment of multiple families from single events (e.g., community-sponsored recruitment event). However, the authors acknowledged that such an assertion is in and of itself an empirical question.

Building on the strengths and limitations of such prior work, the current study aimed to better understand the cost *and* cost-effectiveness of various strategies for reaching and engaging low-income families of children with BDs for a BPT program. We hypothesized that strategies that require more resources (thus, the more expensive strategies) would result in more interested families and yield a higher number of study participants. If found cost-effective, these strategies should be preferred (despite their higher cost) by those implementing the program.

METHOD

Participants

For this analysis, we used data collected for an ongoing study comparing a standard BPT program, Helping the Noncompliant Child (HNC) (McMahon & Forehand, 2003), to a technology-enhanced version of HNC (TE-HNC) (Jones et al., 2014). Recruitment was ongoing at the time of data analysis, and therefore analyses were based on 38 participants enrolled at the time of the analyses. Data for the study were collected in 2014–2016 and analyzed in 2016.

Families were included in the parent project if they met criteria for “low-income” (i.e., adjusted gross income did not exceed 250% of the federal poverty limit) and had a child aged 3 to 7 years old (age range for which HNC was developed and tested) who exhibited disruptive behaviors in the clinical range as evidenced by meeting or exceeding clinical cutoffs on the caregiver report of the Eyberg Child Behavior Inventory (ECBI) Severity or Intensity Subscales (Eyberg & Pincus, 1999) and/or received a diagnosis of ADHD, ODD, and/or CD on the MINI International Neuropsychiatric Interview (Lecrubier et al., 1997). Families were excluded if (1) the child had a developmental or physical disability that precluded use of HNC skills; (2) the caregiver met the criteria for a current diagnosis of substance abuse/dependence, bipolar disorder, severe depression, or psychotic disorder; and/or (3) the family had a pending allegation or past substantiation of child maltreatment with the Department of Social Services.

Procedure

Initial eligibility of participants was determined via a phone screen. Families deemed eligible during the phone screen completed a pre-assessment interview, which verified eligibility and included consent for parents and children, and a more extensive caregiver assessment battery. Caregivers received \$50 for this assessment. Eligible families were then randomized to HNC, a standard BPT program, or TE-HNC (Jones et al., 2014). During the phone screen, potential participants were asked how they heard about the program, and the appropriate recruitment strategy was recorded as part of the interview. We identified 13 strategies, for which cost and recruitment data were available. Table 1 lists the recruitment strategies and briefly describes each.

Measures

For this analysis, we used data from a 2-year period (February 2014 through February 2016).

Costs—We calculated costs that were spent on each recruitment strategy and the number of families that were screened and enrolled into the program during this period. Costs associated with recruitment were tracked as part of a more comprehensive prospective effort to collect costs required to deliver the HNC and TE-HNC programs. Investigators developed a Microsoft Excel-based cost data collection instrument to collect cost data from program staff using an activity-based costing approach with recruitment being a separate activity. Program staff reported the number of hours spent on each activity (including recruitment) on a weekly basis. Program staff tracked the time spent on one-time activities, such as

developing flyers, and ongoing activities, such as posting flyers. Program staff also recorded non-labor purchases associated with recruitment (e.g., printing flyers, placing ads). Once the cost data were collected, investigators went through the records and assigned a recruitment strategy to each cost entry based on dates and descriptions of purchases. Program staff time was valued using the 2014 median national hourly wage for masters-level mental health counselors from the Bureau of Labor Statistics (2015) adjusted to include fringe benefits.

Effectiveness—Our main measure of effectiveness was the number of families that enrolled in the program as a result of each recruitment strategy. However, we also assessed the number of families that called in for the initial phone screen to examine the success of each strategy to reach potential participants. A total of 165 families responded to one of the 13 recruitment strategies, and 38 of those families (23%) enrolled in the study during the 2-year period.

Data Analyses

Cost-effectiveness of each recruitment strategy, from which at least one family enrolled, was expressed as cost per family enrolled (primary measure of cost-effectiveness) and cost per family screened (supplementary measure of cost-effectiveness); thus, we assessed average cost-effectiveness of these strategies. We also calculated incremental cost-effectiveness ratios where each strategy was compared with its next best alternative (strategy that enrolled the next highest number of families) by dividing the difference in costs between the two strategies by the difference in the number of families enrolled. Our conclusions from the incremental cost-effectiveness analysis were the same as from the average cost-effectiveness analysis; thus, we only report the average cost-effectiveness ratios in this paper.

RESULTS

As noted in Table 1, the total cost of all strategies combined during the 2-year period was \$11,496 with an average cost of \$885 per strategy or \$255 per enrolled family. Across strategies, total costs ranged from \$25 for the “Facebook page” to \$2,540 for “grocery store cart ads.” All strategies incurred labor costs, and “flyers” was the most labor-intensive strategy (\$1,687 in labor costs). Almost half (6 of 13) of the strategies did not incur any non-labor costs. The strategies with the highest total costs usually incurred high non-labor costs; “grocery store cart ads” incurred the highest non-labor costs (\$2,389).

Next, we examined the number of families screened and the number of families enrolled into the study as a result of each recruitment strategy (see Figure 1). No families responded to the “grocery store cart ads” strategy (even for a phone screen). No families were enrolled as a result of a “Facebook ad” and “events/presentations.” “University mass e-mail” and “school flyers” resulted in the most phone screens (34 each); however, only 10% of these families enrolled in the study (3 and 4 families, respectively). “Craigslist” was the most effective strategy, with 30 families screened and 11 of them enrolling.

Total costs, the number of families screened and enrolled, and the cost per family screened and enrolled for each of the strategies were also examined (see Table 2). “University mass e-mail,” “research study listing,” and “Craigslist” had the lowest cost per family screened (less

than \$20 each). The four strategies with the lowest cost per family enrolled were “Facebook page,” “Craigslist,” “university mass e-mail,” and “organization/agency (less than \$90).

Finally, Figure 2 illustrates the cost-effectiveness analysis by graphing the number of families enrolled and total cost of each recruitment strategy. The line in the graph connects the most effective strategy (i.e., “Craigslist”, which enrolled 11 participants) and the graph coordinate (0 participants and \$0). The slope of this line is the cost-effectiveness ratio of the “Craigslist” strategy, which is \$48 per enrolled participant, and the line demonstrates the cost-effectiveness threshold given the most effective strategy. The strategies that fall on or below this line (“Facebook page” and “university mass e-mail”) have favorable cost-effectiveness compared with the strategies that fall above the line because they have a lower (“Facebook page” - \$25 per enrolled family) or almost equal (“university mass e-mail” - \$50 per enrolled) cost-effectiveness ratios as “Craigslist”.

DISCUSSION

With the aim of better understanding the strategies most likely to reach and engage low-income families of children with BDs in mental health services, we examined the cost and cost-effectiveness of various recruitment strategies. Findings revealed variability in recruitment strategies; however, not necessarily a pattern consistent with study predictions. Indeed, some strategies were more effective at reaching wider groups of people and recruiting families to call for the phone screen, but were less effective at reaching participants who were eligible for the study. For example, for four of the strategies only 25% or less of screened participants enrolled in the study and for only two of the strategies, 100% of the screened participants enrolled (the number of screened was only 2 and 1 for these two strategies). Majority (85%) of families who were screened but did not enroll did not meet eligibility requirements and the remaining 15% did not participate due to barriers, such as time, money, transportation, and lack of other resources. Targeting of the eligible populations rather than wide recruitment efforts are important factors to consider when determining how to utilize resources during recruitment. An ideal strategy would reach a high number of families that are eligible to participate.

Of note, we hypothesized that the more expensive strategies would yield a greater number of participants; yet, the data did not support our hypothesis. Strategies that cost more than \$800 recruited on average 2.5 participants while strategies that cost less than \$500 recruited on average 2 participants. The additional costs of the more expensive strategies did not warrant the outcomes as the cost-effectiveness ratios of these strategies were relatively high as compared with less expensive strategies. Furthermore, the most expensive strategy (grocery cart ads) did not yield any participants.

Interestingly, the “Facebook page” had the lowest cost per family enrolled (\$25) and, thus, is considered to be the most cost-effective strategy. However, it resulted in only one screened and enrolled family over a 2-year period during which the page was available; thus, investigators should not rely solely on the most cost-effective strategy for all of their recruitment efforts. Instead, a mix of strategies with low costs per family screened should be considered and implemented as the most cost-effective approach for recruiting low-income

families. For example, using the data from this study, implementing “Facebook page,” “Craigslist,” “university mass e-mail,” and “organization/agency” would have resulted in an average recruitment cost of less than \$60 per family enrolled. A combination of strategies may be optimal for recruiting low-income families even if they target the same group of potential participants. For example, Rodriguez et al. (2006) reported that low-income Latino families were more likely to participate in a research study on parenting practices after the information about the study had reached them in a number of different ways.

In our study, in addition to the 165 families that were phone screened as a result of the 13 strategies assessed here, 29 other families (representing 15% of total phone screens) indicated that they heard about the program through word of mouth. Seven of those families (representing 16% of total enrolled families) enrolled in the program. Importantly, word-of-mouth has proven a successful strategy in prior research with low income families as well (Rodriguez et al., 2006); yet, quantifying costs for this strategy is challenging because it does not involve any direct costs. Another challenge with the word of mouth strategy is that it is not easily controlled or implemented as it relies on those who are aware of the study or program (e.g., former participants) to share their positive experiences. One way to quantify the word of mouth effect is to calculate a multiplying factor ($1 + 29 \text{ families screened from word of mouth} / 165 \text{ families screened from formal recruitment} = 1.18$). This can be interpreted as follows: for every 6 families that responded to a recruitment strategy and called in for a phone screen, 1 more family called in as a result of word of mouth.

Limitations

As with all research, the reader should interpret results within the context of study limitations. First, cost-effectiveness evaluation of recruitment strategies was not the primary objective of the randomized control trial where the HNC program is compared with the TE-HNC arm. Thus, various recruitment strategies were identified as the project went along; those that did not show any promise were discontinued, and the more promising strategies were implemented continuously. Second, our sample was racially and ethnically diverse (55% of screened families were white, 29% were black or African American, and 12% were of more than one race; 11% of screened families identified as Hispanic/Latino); however, findings may be specific to low-income families. Finally, the list of recruitment strategies in this study was not exhaustive; other strategies that we did not use (e.g., door-to-door, phone calls) may also have been effective and cost-effective for engaging low-income families.

Strengths of the study also merit attention. We present results for a variety of recruitment strategies. Recruitment costs were calculated using a prospective cost data collection approach that included labor and non-labor resources required for study implementation and delivery. We were also able to identify recruitment numbers for each strategy and differentiate between the number of families screened vs enrolled as a result of each strategy. Review of these recruitment results allowed us to adjust our future recruitment efforts for the remainder of the study.

In summary, recruitment represents an essential effort of a research study and usually requires significant resources, especially when the goal is to engage hard-to-reach populations, such as low-income families. In fact, engagement of low-income families into

BPT programs is important for research purposes, so that efficacy of treatments for these populations can be established, and in real-world settings, so that families that benefit the most from these types of programs are provided with information on how to access them. Building on previous research, we recommend using a combination of recruitment strategies when working with low-income families. Results of our analysis indicate that “Facebook page,” “Craigslist,” “university mass e-mail,” and “organization/agency” appear to be the more cost-effective approaches for recruiting low-income families to participate in a BPT program.

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Figure 1. Number of Families Screened and Enrolled by Recruitment Strategy

Note: Total cost for each strategy is shown in parentheses after the strategy name.

Figure 2.
Costs and Number of Families Enrolled by Recruitment Strategy

Table 1**Summary of Recruitment Strategies**

	Labor Costs		Costs, \$	
	Hours	\$	Nonlabor	Total
Facebook ad	2	50	106	156
Events/presentations	33	831	0	831
Grocery cart ads	6	151	2,389	2,540
Facebook page	1	25	0	25
Research study listing	5	126	0	126
Mailer ad	6	151	900	1,051
University mass e-mail	6	151	0	151
Research database	2	50	400	450
Organization/agency	14	353	0	353
Bus ad	5	126	705	831
School flyers	14	353	1,778	2,131
Flyers	67	1,687	635	2,322
Craigslist	21	529	0	529

Table 2

Cost Per Family Screened and Enrolled by Recruitment Strategy

Strategy	Screened		Enrolled	
	Total Cost, \$	Number	Cost Per Person, \$	Number
Facebook page	25	1	25	1
Research study listing	126	10	13	1
University mass e-mail	151	34	4	3
Facebook ad	156	1	156	0
Organization/agency	353	16	22	4
Research database	450	5	90	3
Craigslist	529	30	18	11
Bus ad	831	12	69	4
Events/presentations	831	4	208	0
Mailer ad	1,051	2	526	2
School flyers	2,131	34	63	4
Flyers	2,322	16	145	5
Grocery store carts	2,540	0	n/a	0
				n/a

Note: "n/a" indicates that the cost per person could not be calculated because zero families were recruited by the strategy.