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Adaptive Recruitment and Parenting Interventions for Immigrant Latino Families with Adolescents

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Abstract

Parenting programs are an effective strategy to prevent multiple risky outcomes during adolescence. However, these programs usually enroll one caregiver and have low attendance. This study evaluated the preliminary results, cost, and satisfaction of adaptive recruitment and parenting interventions for immigrant Latino families. A mixed methods study was conducted integrating a pre-post design with embedded qualitative and process evaluations. Fifteen immigrant Latino families with an adolescent child aged 10–14 were recruited. Two-caregiver families received a home visit to increase enrollment of both caregivers. All families participated in an adaptive parenting program that included group sessions and a one-to-one component (online videos plus follow-up telephone calls) for those who did not attend the group sessions. The intervention addressed positive parenting practices using a strengths-based framework. Primary outcomes were the proportion of two-parent families recruited and intervention participation. Secondary outcomes were change in parenting self-efficacy, practices, fidelity, costs, and satisfaction. Participants completed questionnaires and interaction tasks before and after participating in the intervention. In addition, participants and program facilitators completed individual interviews to assess satisfaction with the program components. Overall, 23 parents participated in the intervention; 73% of two-parent families enrolled with both parents. Most participants completed 75% or more of the intervention. Fathers were more likely to use the one-to-one component of the intervention than mothers ($p = .038$). Participants were satisfied with program modifications. In sum, adaptive recruitment and parenting interventions achieved high father enrollment and high participation. These findings warrant further evaluation in randomized trials.

Keywords Personalized medicine · Prevention · Parenting · Latinos · Adolescents

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Evidence-based approaches to reduce health disparities experienced by Latino adolescents, such as internalizing and externalizing behaviors (Centers for Disease Control and Prevention 2008; Johnston et al. 2014; Perou et al. 2013) and teen pregnancy (National Campaign to Prevent Teen and Unplanned Pregnancy 2012), include interventions that promote positive parenting practices and parent-youth relationships (Jackson et al. 2012). These interventions could have a greater impact in Latinos due to strong cultural value towards family (Almeida et al. 2009). Although the results of family-based prevention programs with Latinos are encouraging (Garcia-Huidobro et al. 2017), low enrollment and attendance, especially among fathers, reduce their impact (Lundahl et al. 2008; Olofsson et al. 2016). Important reasons for low participation include scheduling and the group format in which parenting interventions are frequently delivered, which are particular challenges for low-income families (Garcia-Huidobro et al. 2016a).

Recognizing the importance of individual factors affecting interventions' effects on outcomes, many have highlighted the need for tailoring preventive and therapeutic interventions to the individual's needs and preferences (August et al. 2010; other citations from the special issue). Intervention individualization could include modifying the delivery settings (e.g., from schools to clinics), the format (e.g., from group to one-to-one), the content (e.g., certain modules depending on the participant's characteristics), or the treatment option (e.g., participants choosing between alternative treatments), so interventions have a better match with the needs and preferences of users. Even though one-to-one programs are more expensive than group programs (Prinz et al. 2009), these take into account participants' needs and preferences and reduce group stigmatization, which reduce attrition and produce better results (Swift et al. 2011).

Padres Informados Jovenes Preparados (PIJP) is a culturally-sensitive parenting program developed using Community-Based Participatory Research (CBPR; Allen et al. 2012). The program aims to improve parenting skills and parent-youth relationships to prevent smoking and other substance use among Latino youth. The original intervention is delivered in a group format and includes eight parent and four youth weekly sessions. Because the program was developed using CBPR, it highlights values relevant for Latinos, such as family orientation, trust, and respect. The efficacy of PIJP was tested in a randomized trial including 352 Latino families with children between 10 and 14 years, and improved parenting practices and parent-child relationships, and reduced smoking susceptibility among youth who had parents more disconnected from their culture of origin (Allen et al. 2017a). Even though PIJP achieved similar or higher participation rates compared to other parenting programs for Latinos (Garcia-Huidobro et al. 2016a), parent attendance was inconsistent. As with other group-based interventions, an important barrier for attendance in PIJP was having conflicts with the program schedules (Garcia-Huidobro et al. 2016a). In addition, only 12% of youth enrolled with two caregivers (Allen et al. 2017a), potentially limiting the program's impact on family and youth outcomes.

One approach to addressing the challenge of low enrollment of two caregivers (when possible) and low program participation is to develop adaptive recruitment and parenting interventions. Adaptive interventions are flexible interventions that adjust based on participant's characteristics (Collins et al. 2004). An adaptive recruitment intervention that aims to increase father enrollment could optimize resources by focusing only on families with two caregivers (adaptive to participant's family structure). An adaptive parenting intervention could increase participation by providing an alternative intervention to participants who cannot or do not want to receive the main program (adaptive to participant's availability and/or preference).

The aims of this study were to evaluate an adaptive recruitment intervention at enrolling two caregivers and an adaptive version of PIJP at achieving high participation. It was hypothesized that the recruitment intervention would achieve high enrollment of two caregivers (among two-caregiver households) and that the adaptive version of PIJP would produce higher attendance than PIJP. In addition, this study assessed change in parenting self-efficacy, parenting practices and co-parenting (only among two-caregiver families), intervention costs, and satisfaction with program innovations, and compared results with the PIJP study to contrast the relative effects of the innovations implemented.

Research Approach

This study was grounded in CBPR principles (Allen et al. 2017b; Mikesell et al. 2013). A partnership between organizations serving Latino families, a former PIJP participant frustrated with low father participation, and an academic researcher aimed to address the need of expanding the use of parenting programs in the Latino community, especially among fathers. After developing trust and respect, open communication, and developing decision-making protocols, the partnership evaluated the characteristics of parenting programs that would fit the needs and preferences for mothers and fathers (Garcia-Huidobro et al. 2016b). Then, new community partners were approached to support a participatory implementation of this project.

Methods

Study Design

This study used a concurrent embedded mixed methods design. This design gives priority to a methodological approach that guides the project, while the second method is embedded to provide a supporting role (Creswell and Plano-Clark 2011). In this study, the main approach was quantitative and included a pre-post study that compared findings with data from the original PIJP intervention. Outcomes were assessed using several measurement methods including parent, youth and facilitator reports, observational assessments, and program implementation data. The qualitative component consisted of participant and facilitator qualitative interviews that were embedded to evaluate satisfaction with program adaptations. Methodological integration occurred at the study design level (through a concurrent embedded design), at the methods level (through the connection of parent and youth surveys and observations, including individual interviews, and merging the PIJP dataset to the present study's data), and at the reporting level (narrative and joint displays). All these mixed method integration approaches were implemented to enhance the

value of the evaluation (Creswell and Plano-Clark 2011; Fetters et al. 2013).

Participants

Fifteen single or two-caregiver families were recruited from primary care clinics and community agencies located in Minneapolis, Minnesota, using similar recruitment strategies and inclusion/exclusion criteria of PIJP. Participants were either invited directly by staff from those organizations or responded to printed or electronic fliers (e.g., organization's Facebook page). At least one caregiver (parent or parent-figure) had to be born in South or Central America or Mexico, and speak Spanish. Youth had to be between 10 and 14 years old and speak Spanish and/or English. Participants were excluded if at least one parent had participated in the original PIJP study.

Figure 1 presents the flow of study participants. A total of 38 participants from 15 families enrolled in the parenting program (15 mothers, 6 fathers, two father-figures, and 15 youth). Parents were mostly from Mexico (61%), married or cohabitating (70%), had completed high school (78%), and were employed (87%). On average, they had 37.3 years, with 14.1 years living in the USA. There were seven boys (47%) and eight girls (53%). Almost all were born in the USA (93%) and had on average 12.2 years of age. This sample had several differences to the sample of the original PIJP study (Online Appendix 1).

Adaptive Recruitment Intervention

The adaptive recruitment intervention was triggered by the number of caregivers living with the adolescent. If the youth lived with two parents or two caregivers, they received a 45-min recruitment home visit. Single caregiver households did not receive this intervention, as it aimed to recruit a second caregiver when available. The goals of the home visit were to provide information about the program directly to both caregivers, allow them to experience how the program worked, and build a relationship between the potential participants and the program's staff. Details of the visit are provided in the Online Appendix 2. The facilitator of this intervention was a

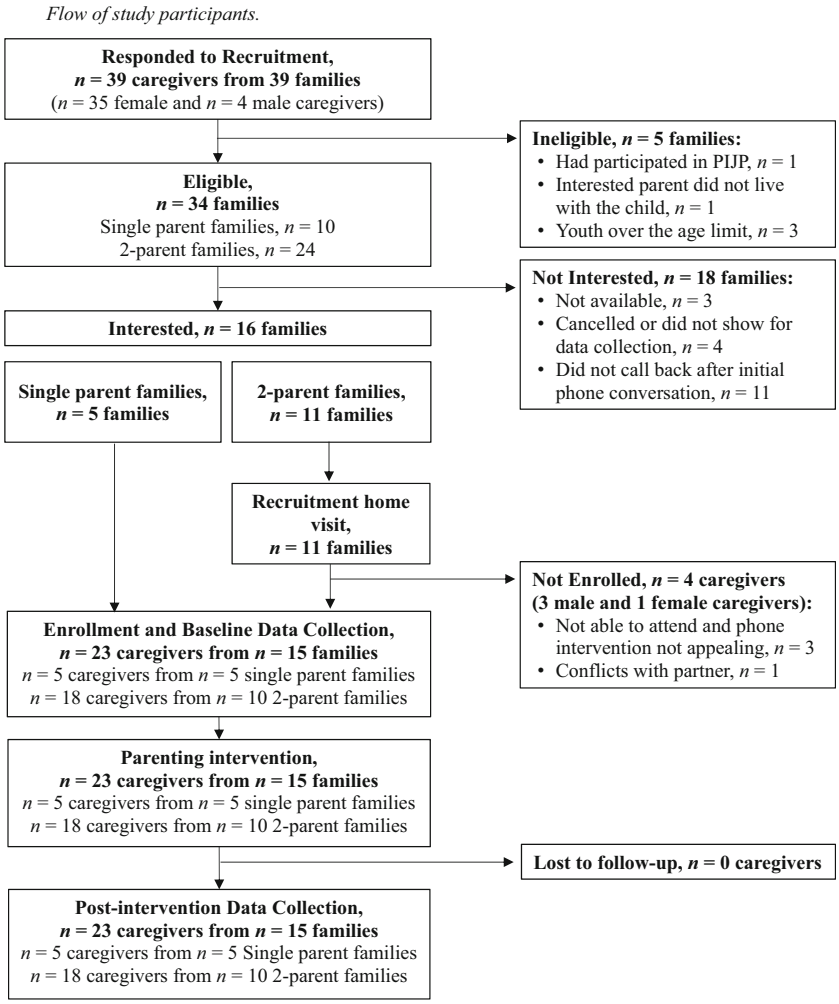

Fig. 1 Flow of study participants

Latino graduate student with similar experience to a parent educator. Two days after the visit, participants were asked individually if they still desired to enroll in the program.

Adaptive Parenting Intervention

The parenting program had two components: group and one-to-one sessions. The trigger for the one-to-one component was not attending the group sessions. The group component was similar to the original PIJP intervention and included eight 2.5-h weekly sessions for parents and four sessions for youth, covering topics related to positive parenting. Details of the PIJP curriculum are presented elsewhere (Allen et al. 2012) and summarized in the Online Appendix 2. Adaptations to the group sessions included (1) adding a co-parenting orientation, (2) including activities separated according to the participant's parenting role (mothers and fathers), (3) enabling participants to choose additional topics, and (4) including male and female co-facilitators. Sessions were led by a parent educator and a community health worker from a partner organization at a local community agency.

The one-to-one component was only for parents and included online videos with the same contents of the group sessions and a follow-up telephone call to debrief key messages. Online Appendix 2 presents a detailed description of this intervention component. The structured phone calls were conducted by a graduate student with similar experience to a parent educator and the community health worker who co-facilitated the program.

Recruitment and Data Collection

After confirming eligibility and receiving basic information about the study, families were invited to call back if interested in scheduling a recruitment home visit (two-caregiver families only) or a data collection session (single-caregiver families only). Before and after the intervention, parents and youth completed questionnaires and interaction tasks at a location of their preference, most frequently their home. After completing the program, parents and facilitators also completed an individual interview. Participants received a $25 gift card when completing each data collection session and the individual interview.

Interaction Tasks Parents and youth completed eight video-recorded parent-child discussions. These tasks were modified from tasks previously used with Latino families with adolescents (Dishion et al. 2012). Modifications included length (from 5 to 4 min), content (e.g., family conflict instead of family culture), and focus (e.g., instead of focusing only in youth's strengths, a new task focused in youth and parent's strengths). The first task was a warm-up and was not coded. The other tasks were the (a) family involvement task, during which youth were asked to discuss how the parent was involved in their life; (b) monitoring task, during which parents and youth talked about a time when the adolescent was with friends without adult supervision; (c) family conflict task, involving a discussion of a time when the parents and adolescent had a conflict; (d) two problem-solving tasks, where the parent and youth were asked to solve a problem that they had previously identified as challenging; (e) discipline task, during which participants discussed family rules and how these were followed; and (f) positive recognition task, where the parent and adolescent talked about positive characteristics of each other.

Individual Interviews Audio-recorded semi-structured interviews with parents ($n = 23$) and facilitators ($n = 3$) were conducted in Spanish by a research assistant experienced in qualitative data collection who did not have previous contact with study participants. The interview guides, presented in Online Appendix 3, used open-ended questions that assessed experiences with the different adaptations of the program.

Facilitator Training

Facilitators were trained in human subject's protection, intervention components, and the rationale for the adaptations. This last point was highlighted during the trainings to emphasize the importance of the co-parenting focus and the integration of male participants in the group sessions. The home visit facilitator attended a 2-h training. Facilitators of the sessions for parents completed an 8-h training; those who facilitated group sessions with youth completed a 4-h training. Additionally, facilitators of the one-to-one parenting component received 4 h of training.

Outcomes

The primary outcome for the recruitment intervention was the proportion of two caregivers enrolled among those who received the recruitment visit (two-caregiver families). The primary outcome for the parenting program was program attendance (either through the group sessions or the one-to-one component). Secondary outcomes were change in parenting behaviors, delivery fidelity, program satisfaction, and costs.

Measures

Program Implementation The recruiter recorded characteristics of participants who called asking for information about the program. Program facilitators logged the number of home visits completed, attendance at group sessions, and phone calls completed. After the phone calls, facilitators assessed if participants watched the online materials. Intervention delivery was audio- or video-recorded to determine the facilitator's

fidelity to the manuals for home visits, group sessions, and phone calls. Activities described in the manuals were rated as completed or not by an external evaluator. Most activities were implemented as protocolized: 100% of home visits, 74% of group sessions, and 71% of the phone calls completed all activities and delivered contents as described.

Parent and Youth Reported Parenting and Parent-Youth Relationships Parents and youth rated parental communication, consistent discipline, monitoring knowledge, parent-child conflict, parental involvement, and harsh parenting using the same parallel scales that were used in the PIJP trial (Allen et al. 2012). Response options were Likert scales that ranged from 1 (*almost never or never*) to 5 (*almost always or always*) and were averaged to compute the scales. In this sample, Cronbach's α for these measures ranged from .70 to .85. Parents also completed the Parenting Practices Self-Efficacy Scale (10 items, $\alpha = .91$; Dumka et al. 2002), and parents of two-parent families completed a Spanish version of the Coparenting Relationship Scale (Feinberg et al. 2012). This scale measured several co-parenting dimensions (e.g., agreement, support, division of labor, among others) using a 5-point Likert scale (30 items, $\alpha = .70$).

Interaction Tasks Videos were coded using a modified version of the Family Assessment Task Coder Impressions macrorating system (Dishion et al. 2007). For the dimensions not included in the rating system (e.g., communication and consistent discipline), a rating system was created using similar items of the self-reported measures for these domains. The macroratings reflected the coder's impression of parenting or the parent-child relationship. Each score was made on a scale ranging from 1 (*not at all*) to 5 (*very much*). The sum of scale scores was divided by the number of items to calculate scale scores for positive communication (12 items, Cronbach's $\alpha = .70$), consistent discipline (5 items, $\alpha = .89$), monitoring knowledge (5 items, $\alpha = .81$), parent-child conflict (7 items, $\alpha = .65$), parental involvement (4 items, $\alpha = .95$), and co-parenting (10 items, $\alpha = .78$). Two graduate students were trained in the observational coding system using a different set of videos until reaching agreement $\geq 80\%$. Agreement allowed for 1-point discrepancies. Then, videos were assigned at random and each task was coded independently. To assess reliability, 20% of the videos were double-coded; interrater agreement was 80.2%.

Satisfaction As in PIJP, at the end of the program, participants evaluated the group's cohesion (four items, $\alpha = .79$), participant engagement (four items, $\alpha = .67$), and perceived program utility (five items, $\alpha = .80$), using 5-point Likert scales. Scale scores were estimated dividing the sum of the item scores by the number of items.

Program Costs All expenses related to the implementation of the programs were documented. Staff salaries included benefits. Costs included staff's time for recruitment, training and intervention delivery, childcare, program materials, and snacks. Work conducted by the graduate student with similar experience to a parent educator was valued as such. Research-related (e.g., participants' compensation) and intervention development costs were not included. Facility expenses were also not included as this was provided free of charge by a community partner.

Padres Informados, Jovenes Preparados Data This study used similar procedures to PIJP (Allen et al. 2012), including active community engagement during the study, and similar data collection protocols and self-reported measures.

Data Analysis

Quantitative Data Descriptive statistics were used to summarize participant and program characteristics. The number of sessions attended between male and female participants was compared using a *t* test for independent samples. Change in self-reported and observed parenting scales were calculated as the difference between the pre- and post-intervention assessments. The *t* tests for paired samples were estimated. Significant pre-post intervention change was defined a-priori as an effect size (Cohen's *d*) of .3 or larger, regardless of the resulting *p* value. This threshold was chosen to reflect a small to medium magnitude of effect that is typical of parenting interventions (Shelleby and Shaw 2014). The *p* values and covariate adjustment were disregarded due to the reduced sample size.

To evaluate the relative contribution of the implemented innovations, the results from this study were compared to the findings of the participants in the intervention group of the original PIJP study. Two strategies were used. First, the comparison group included *all participants* that received the PIJP intervention. Because of this study's limited sample size and the high number of confounding variables with significant differences between groups, participant exchangeability could not be assured through covariate adjustment (Garcia-Huidobro and Oakes 2017). Thus, the second comparison introduced participant matching as a strategy to minimize confounding (Garcia-Huidobro and Oakes 2017). In this approach, participants from this study and the intervention group of the PIJP original trial were stratified on parental gender, country of birth and employment status, and child's country of birth. Then, the sample from this study was randomly matched 1:1 to a subsample from the original study. This process ensured a similar comparison group (Online Appendix 1), reducing alternative explanations to the observed differences between groups (Garcia-Huidobro and Oakes 2017). Comparisons focused on outcomes of the

present study and used chi-square and *t* tests for categorical and continuous variables, respectively.

Qualitative Data Audio recordings were transcribed and analyzed in Spanish using NVivo 11 (QSR International, Melbourne, Australia). Following the procedures of Content Analysis (Weber 1990), data were classified within each prespecified adaptation: recruitment home visit, parent separation, facilitators' gender, co-parenting focus, selection of program's topics, and video and telephone component. Two coders inductively developed an initial coding schema by consensus on five transcripts (20.8% of data). The initial coding schema was discussed with an external researcher who helped naming and organizing the initial themes. Then, a single researcher, open to emerging themes, analyzed the remaining transcripts. One in five interviews was double-coded; interrater agreement was 86.9%. Consensus meetings were held to prevent coder drift. Memos were kept and included in the data analysis. Findings were presented to program facilitators for validation.

Mixed Methods Integration Quantitative data from parent and youth reports and from observational coding were combined in a joint display. This integration method presents data from different sources in a single figure, table, matrix, or graph (Fetters et al. 2013); in this case, parent and youth reports and observational assessments were presented in a single figure. Then, these data were triangulated to corroborate findings (Creswell and Plano-Clark 2011). Qualitative data from participant and facilitators' interviews were also triangulated to evaluate similarities and differences in perceptions with the program adaptations (Creswell and Plano-Clark 2011). In addition, interview findings were compared to parents' quantitative satisfaction assessments. Finally, data were also integrated using a contiguous narrative approach, which involves the presentation of findings in a single report but in different sections (Fetters et al. 2013).

Results

Father Enrollment

After the recruitment home visit, eight couples (73%) and two mothers enrolled in the program (82% of the total potential participants; Fig. 1). Some fathers decided not to enroll because of scheduling conflicts, and the one-to-one component was not appealing for them ($n = 2$), or marital difficulties that limited their participation ($n = 1$).

Participant Attendance

Online Appendix 4 displays male (M) and female (F) attendance to the group and one-to-one components. Although some participants used only the group ($n = 4$, 17%) or one-to-one intervention components ($n = 2$, 9%), most participants used a combination ($n = 16$, 70%). Overall, participants attended 5.7 group sessions and received 1.7 phone calls. All but one participant completed 75% or more of the intervention (96%). Even though most male caregivers attended several group sessions, on average, fathers had a higher use of the one-to-one component (3.1 vs 1.1 sessions, $p = 0.038$). This difference is explained because two male caregivers (25%) received the whole program through the one-to-one component.

Pre-Post Effect on Parenting Self-Efficacy, Practices, and Parent-Youth Relationships

Parent self-reports showed significant improvements from baseline to post-intervention assessments that were not confirmed by youth reports or observational assessments of interaction tasks. Table 1 presents changes in the mean scores between the post-intervention and baseline assessments. Both mothers and fathers perceived positive changes in their parental self-efficacy, parenting practices, and relationships. Youth perceived that their parents had lower communication skills after participating in the program. Observational assessments only reported increased parental involvement.

Satisfaction

At the end of the program, participants reported very high group cohesion, program engagement, and utility. Likewise, perceptions from both participants and facilitators were very positive (Table 2). There was high satisfaction with the recruitment component, and with the adaptations to the group sessions including parent separation, having female and male facilitators, a co-parenting orientation, and having participants determine certain components, and the one-to-one component with videos and telephone calls.

Program Costs

Online Appendix 5 displays the costs of the implementation of the recruitment and parenting interventions. Overall, the delivery of the whole intervention had a cost of $771.14 per family. The recruitment intervention costed $71.37 per family, the group component $372.28 per parent (including the cost of the program recruiter), and the one-to-one component was $96.54 per participant.

Comparison to the PIJP Study

Compared to the 1:1 matched sample and the complete intervention group of the PIJP trial, the adaptive recruitment enrolled a significantly higher rate of fathers (Table 3). In

Table 1 Joint display integrating changes in pre- and post-intervention mean scores (SD) in parenting self-efficacy, parenting practices, parent-child relationships, and co-parenting practices of participants, according to the assessment method and parent role

	All participants ($n = 23$)			Mothers ($n = 15$)			Fathers ($n = 8$)		
	Parent reports	Youth reports	Observational coding	Parent reports	Youth reports	Observational coding	Parent reports	Youth reports	Observational coding
Parenting self-efficacy									
Parenting self-efficacy	**0.5 (0.7)*** **	–	–	**0.5 (0.6)***	–	–	**0.7 (0.6)**	–	–
Parenting practices									
Communication	**0.4 (0.5)****	**−0.3 (0.6)**	0.1 (0.5)	**0.4 (0.5)*****	**−0.3 (0.6)***	0.1 (0.6)	**0.3 (0.4)**	0.2 (0.7)	**0.2 (0.6)**
Consistent discipline	**0.7 (0.8)****	0.3 (1.1)	0.0 (1.9)	**0.7 (0.7)****	0.2 (1.0)	0.0 (1.0)	**0.8 (1.0)**	**0.4 (1.3)**	−0.1 (1.2)
Monitoring	0.1 (0.6)	0.0 (0.8)	0.0 (0.9)	0.0 (0.5)	−0.1 (0.7)	0.1 (0.8)	**0.5 (0.6)**	**0.5 (1.1)**	**−0.3 (1.0)**
Harshness	**−0.4 (0.6)****	0.1 (0.8)	–	**−0.4 (0.6)**	0.2 (0.9)	–	**−0.5 (0.6)****	0.0 (0.4)	–
Parent-child relationship									
Conflict	−0.1 (0.6)	−0.1 (0.8)	0.1 (0.7)	−0.1 (0.6)	0.0 (0.8)	0.0 (0.7)	**−0.2 (0.3)**	−0.2 (0.8)	**0.2 (0.5)**
Involvement	**0.6 (0.8)**	−0.1 (1.0)	**0.4 (1.0)**	**0.4 (0.7)***	**−0.4 (0.8)**	**0.4 (0.8)**	**1.0 (1.0)**	0.3 (1.3)	0.3 (1.2)
Co-parenting[a]									
Co-parenting practices	**0.2 (0.3)**	–	0.0 (0.7)	**0.4 (0.4)***	–	0.0 (0.6)	0.1 (0.8)	–	0.1 (0.8)

Bold cells represent increases or decreases larger than .3 effect sizes

*$p < .05$; **$p < .01$; ***$p < .001$ for pre-post intervention change within each group

[a] Co-parenting was only assessed among the two-parent families ($n = 8$ families, 16 participants)

Table 2 Positive (+) and negative (−) themes, and exemplifying quotations of participants ([P]) and facilitators ([F]) with program adaptations

Categories and themes	Exemplifying quotations[a]
Recruitment home visit	
(+) • Encouragement and motivation[P,F] • Program preview[P]	1. "I liked the video I saw where the parents told us how much the program helped them and how it changed their lives, so that made me enthusiastic and eager to go to the program workshops."
Parent Separation	
(+) • Learning from others' experiences[P,F]	2. "I think this could be expanded more to help generate more trust within the fathers and men in the program, so they would feel more confident and want to share more."
(−) • Brief discussion time[P]	3. "When they would group us up as men and women, the men would keep talking (laughs) and the time would pass. There's too much content to cover and not enough time."
Female and Male Facilitators	
(+) • Diversity of parent perspectives[P,F]	4. "I enjoyed (having a co-facilitator of the opposite sex) because it gave more perspective from the male participants and it helped them identify better with the discussions."
Co-parenting-focus	
(+) • Encourages learning together[P,F]	5. "I enjoyed (this focus) because children aren't raised by one person only. It's a shared burden that we need to carry together – not only the woman like in the past where she was in charge of everything…"
(−) • Not everyone has a partner[P,F]	6. "You have to understand that many of the mothers in the group I was in were separated or divorced or single, and they didn't have a partner."
Selection of program topics	
(+) • Enriches program content[P,F]	7. "I liked (this space) because it informed us of how we could understand our children with respect to (education, sexuality, drugs) and how to talk to them, approach the topic and not just raise your voice, but to speak firmly."
(−) • Brief discussion time[P,F] • Not the best guest speakers[P]	8. "I think at least an hour and a half (would have been ideal) because there were many people with many questions and the session would end and we were expected to stay after for a while to ask (the speaker questions), but I didn't want to take up too much of her time."
Videos and telephone calls	
(+) • Good as follow-ups[P]	9. "I liked that the facilitators were very considerate of the participants, so that they would follow the group progress and they would motivate you to want to attend the next session."
(−) • Not the same experience as the group sessions[P]	10. "I liked the videos, but it isn't like being in the program because there are more opinions from others and you learn a bit more, and you express yourself better."

[a] Quotations in Spanish are presented in the Online Appendix 6

addition, the adaptive parenting intervention achieved higher participation, with similar or better results in parenting self-efficacy, parenting practices, parent-child relationships, and satisfaction than the original study.

Discussion

This study presents the implementation and evaluation of adaptive recruitment and parenting interventions for immigrant Latino families. Interventions were designed and implemented using CBPR principles to increase relevance and potential benefit (Mikesell et al. 2013). Home visits, and group and one-to-one sessions were implemented with fidelity producing high rates of engagement, satisfaction, and positive changes in parenting based on parent's perspectives.

Low father recruitment and intervention participation have been a long-lasting challenge in the parenting programming arena (Lundahl et al. 2008; Olofsson et al. 2016). Adaptive interventions with individualized components can contribute addressing these issues. First, a recruitment intervention delivered only to two-caregiver families resulted in an impressive enrollment of 73% of fathers or father-figures. Although parenting programs often aim to reach both parents when available, these interventions are mostly attended by mothers (Lundahl et al. 2008). For example, in the original PIJP study, only 13% of the youth enrolled with two caregivers even though most participants were married or cohabitating (Allen et al. 2017a). Through the home visits, fathers got first-hand information about the program and how they could benefit from it. This is especially important given that only 10% of the people who made the initial contact with the program recruiter were males. If this intervention would have not existed, only motivated mothers would have passed information about the program to their partners, limiting the knowledge of this program's existence and availability to fathers or father-figures (Garcia-Huidobro et al. 2016b). Recruitment home visits enabled participants to get a preview of the parenting intervention and increase motivation. This is important as Latino parents consider parenting interventions unknown (Garcia-Huidobro et al. 2016a), and this rate could be considered as a benchmark to estimate intervention effects for future

Table 3 Outcomes of the present study compared to outcomes observed in the intervention group of the Padres Informados, Jovenes Preparados trial, and the matched sample

Outcome	Adaptive intervention sample ($n = 23$)	Original PIJP intervention sample ($n = 174$)	p value	Original PIJP intervention randomly matched subsample ($n = 23$)	p value
Enrollment					
Male caregiver enrollment, n (%)	8 (34.8%)	13 (7.5%)	< .001	8 (34.8%)	1.000
Two caregivers enrolled, n (%)	16 (69.6%)	22 (12.6%)	< .001	4 (17.4%)	< .001
Participation					
Number of sessions completed, mean (SD)	7.4 (1.7)	5.0 (2.8)	< .001	4.5 (3.2)	< .001
Participants completing 75% or more sessions, n (%)	22 (95.7%)	101 (58.1%)	< .001	11 (47.8%)	< .001
Pre-post change in parent-reported self-efficacy, parenting practices, parent-child relationship, mean (SD)					
Parenting self-efficacy	**0.5 (0.7)*** **	**0.3 (0.5)*** **	.088	**0.2 (0.4)***	.081
Communication	**0.4 (0.5)****	**0.2 (0.5)*** **	.073	**0.2 (0.4)***	.141
Consistent discipline	**0.7 (0.8)****	**0.3 (0.6)*** **	.004	**0.3 (0.5)***	.048
Monitoring	0.1 (0.6)	0.1 (0.6)**	.992	**0.2 (0.3)****	.478
Harshness	**− 0.4 (0.6)****	**− 0.3 (0.5)*** **	.380	**− 0.3 (0.4)****	.510
Conflict	− 0.1 (0.6)	**− 0.3 (0.7)*** **	.193	0.0 (0.4)	.513
Involvement	**0.6 (0.8)**	**0.3 (0.8)*** **	.093	0.2 (0.7)	.078
Satisfaction with the intervention, mean (SD)					
Group cohesion	4.5 (0.6)	4.2 (0.8)	.085	4.1 (0.9)	.083
Participant engagement	4.5 (0.5)	4.4 (0.7)	.509	4.5 (0.6)	.996
Perceived utility	4.8 (0.4)	4.6 (0.5)	.067	4.6 (0.6)	.190

Bold cells represent increases or decreases larger than .3 effect sizes

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$ for pre-post intervention change within each program

interventions aiming to increase father involvement in parenting programming.

Second, because the parenting intervention included an adaptive one-to-one component that was used by almost all participants, the overall program use was higher than other parenting programs (Olofsson et al. 2016), especially among fathers (Lundahl et al. 2008). Although, not all participants were able to be reached through the phone calls, those who experienced this component mentioned in their interviews that follow-up phone calls were experienced as personal caring from the program's staff. Participants perceived positively that facilitators monitored their attendance, called them individually, were interested if they watched the online materials, and summarized contents if they were not able to do so. All these programmatic procedures were perceived as special considerations from the program's staff, highlighting the importance of developing trusting and positive relationships when delivering parenting programs (Salinas et al. 2011).

Third, because the recruitment intervention and online videos and telephone calls were targeted only to participants with certain characteristics, in this case to two-caregiver families and participants who did not attend the group sessions, implementing adaptive interventions allowed for resources to be maximized: Participants who were already motivated (e.g., those who got first-hand information from the recruiter) did not receive the recruitment visit, and those who had already attended to a group session did not receive the phone calls. In addition, as these interventions were selective, their development and implementation addressed directly the needs and preferences of the specific participant subgroups (Collins et al. 2004), which produced high use and satisfaction.

Personalized interventions are often criticized for their cost (Fischer et al. 2015; Kohane 2015), as often times they end up being much more expensive than usual care. These interventions were not the exception as the adaptive recruitment and parenting interventions cost $785.03 and $2220.43 more than the original version of PIJP with group sessions only. However, as these interventions recruited and engaged hard-to-reach participants producing similar or greater change in parenting behaviors, there could be an incremental benefit associated to the higher cost. Future studies need to evaluate the cost-effectiveness of personalized preventive interventions.

Although the group component included adaptations that produced high satisfaction and could have increased participation, attendance to group sessions was similar to the original PIJP study (Allen et al. 2017a) and other universal preventive parenting programs for Latinos (Díaz et al. 2006). Similar attendance to the group component might be explained by problems in the implementation of the adaptations such as having allowed for too brief or too few time for discussions

among father or mother participants, the potential iatrogenic consequence of the co-parenting orientation among single mothers, or not having chosen the best speakers for the topics selected by participants. Future iterations of the group sessions should build from this pilot experience.

Because this study was not powered to evaluate impact in parenting outcomes, we aimed to observe change in the "positive direction" between baseline and post-intervention evaluations (e.g., reduction in negative outcomes or increase in positive outcomes) as a sign that the interventions were modifying the outcomes they were designed for. Results showed that the interventions modified mother and fathers' perceptions about their parenting, but less so youths' perceptions or ratings made by an external observer. Report discrepancies are common (De Los Reyes and Ohannessian 2016), and changing actual parenting behavior could take longer than 8-weeks, but modifying participant's self-perceptions about their own behavior is a first step on that direction (French et al. 2012). Because of this promising finding, the adaptive parenting intervention seems appropriate for further experimental evaluations. Trials with larger samples and longer follow-ups should assess parenting outcomes using reports of multiple informants and determine whether this intervention modifies parents' actual parenting.

Although this was a comprehensive study, it is not without limitations. Findings from this proof-of-concept study need to be examined in a randomized trial. Also, since the recruitment intervention was delivered only for two-parent families, this intervention is useful to recruit fathers or father-figures only in this context. During the recruitment phone call, all participants who self-identified as single caregivers were asked if another person had caregiving responsibilities for their teen (e.g., extended family members, friends, neighbors). Because none of the single mothers did, the recruitment intervention targeted two-parent families, even though it aimed to recruit two caregivers regardless of their parenting role. Future studies are needed to evaluate these interventions in new populations, use the recruitment home visit in families with different composition, and implement interventions to increase for non-residential father involvement in parenting programs. Another significant limitation was the absence of a direct control group. Although participants were matched 1:1 to participants from the original PIJP trial, other non-measured characteristics could still confound the comparisons reported. A sequential, multiple assignment, randomized trial (SMART) could be designed to evaluate the implemented adaptive interventions (Collins et al. 2014).

However, this study also has significant strengths, mostly related to its mixed methods nature. First, parenting outcomes were assessed using three sources of information: parent, youth, and external observers. These reports informed discrepancies in findings that need to be further investigated in future studies, as the impact of parenting interventions usually is measured using single-informant data (De Los Reyes and Ohannessian 2016). Second, both participants and facilitators were interviewed to evaluate satisfaction with the implemented innovations. The convergence of both reports supports the importance of the adaptations. Third, the comparison with data from the original PIJP study enabled estimating the potential added benefit of the program modifications. In addition to the cost evaluation, it was possible to calculate the incremental expense of adding the one-to-one version of the program (disregarding the adaptations to the group sessions). Finally, the integration of the multiple quantitative assessments with the qualitative interviews contributed to a comprehensive evaluation of the intervention from different perspectives adding significant methodological rigor. Interviews allowed explaining the findings observed with the quantitative evaluations.

Conclusions

Adaptive recruitment and parenting interventions that were designed to match the preferences of potential users engaged a high number of fathers and mothers. By promoting high participation, these interventions can increase the reach of parent education to a larger number of participants and maximize the impact of these interventions at improving parenting practices to promote adolescent health and well-being. These interventions hold promise for evaluations in large randomized controlled trials.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

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

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

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