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An Open Trial of Parent–Child Care (PC-CARE)-A 6-Week Dyadic Parenting Intervention for Children with Externalizing Behavior Problems

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Abstract

Research shows that parenting interventions are plagued with the problem of early treatment termination. A brief 6-week intervention, parent–child care (PC-CARE) was developed to minimize the time investment for parents while maximizing the probability of improving behavioral problems of their 1–10 year old children. The purpose of this study was to determine the feasibility of PC-CARE and examine preliminary outcomes. The data were collected as part of an open trial in a community mental health clinic and included pre- and post-treatment performance outcomes, weekly measures of treatment progress, and assessments of treatment fidelity. Participants were 64 children and their primary caregivers, referred by physicians, social workers, or self-referred for help with their children’s difficult behaviors. The retention rate was 94%. Results of analyses pre- to post-intervention scores showed significant improvements in child behavioral problems as well as improvements in parenting stress and positive parenting skills. The findings suggest that PC-CARE may be a beneficial treatment for children with disruptive behaviors, encourage future research into the efficacy of this brief parenting intervention, and its effectiveness in other populations and contexts.

Keywords Brief parenting intervention · Child behavior problems · Treatment outcomes · Open trial · Treatment fidelity

Introduction

Estimates of the prevalence of mental health problems in the United States have shown that approximately 1 in 5 children were reported to have mental health problems [1–3]. However, research shows that only slightly more than half of these children received mental health care either with medication or psychosocial services [3]. Research cites inadequate provider capacity, particularly for evidence-based treatments [4, 5] and lack of insurance [6] as barriers to serving children with mental health needs. However, research on mental health service use shows that even when families sought help for their children’s mental health problems, a third never kept one appointment [7].

For the two-thirds of children who seek help and begin mental health treatment, parenting interventions are often recommended, as these treatments have been found to be highly effective, especially for younger children with externalizing behavioral problems (i.e., problem behaviors directed at the environment, such as aggression, defiance, and poor impulse control) [8]. In studies of families participating in parenting interventions, researchers typically report attrition rates from 50 to 70% [9, 10]. In other words, even when families can access mental health services for their children, they are underutilized. In a decade characterized by efforts to disseminate and implement effective evidence-based mental health interventions for children [11], many believe that one of the greatest challenges for evidence-based mental health treatment providers is keeping people engaged in treatment [12]. One strategy for maximizing the effectiveness of parenting interventions for the largest numbers of families is to develop briefer, less intensive forms of interventions that could be provided to families in a variety of settings [13].

In a recent review of the effectiveness of brief (i.e., fewer than 8 sessions) parenting interventions for children at risk

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of externalizing behavior problems, Tully and Hunt [12] reported that studies found significant improvement in child behavior problems, parenting skills, and parenting self-efficacy for families receiving treatment compared to control or comparison groups. Most promising, they reported attrition levels ranging from 9 to 27% and outcomes suggesting that brief interventions were effective for families. However, the review only yielded eight studies that met their inclusion criteria representing three distinct parenting interventions. Furthermore, these interventions were primarily parent-group modalities, and none of the interventions included the child in the treatment process. While encouraging that the parent group modality proved efficacious in these instances, it is not suitable for all situations. For example, many community mental health agencies treating young children are required to have face-to-face contact with those children to be reimbursed for mental health services. Since neither parent group interventions nor individual parent psychoeducation involves the child in the treatment process, they would not be feasible for a community mental health agency to implement. An intervention that works with a parent–child dyad, where the parent is coached but the child is also part of treatment is more likely to serve both the needs of the client and the need for reimbursement for services.

Parent–child care (PC-CARE) grew out of research on effective mechanisms in parenting interventions [8, 14] as well as research on coaching [15] and providing intensive parenting interventions in community mental health settings [16]. We were determined to develop a brief intervention that addressed problems with attrition and engagement reported in much of the research on intensive parenting interventions [9, 10], but that would work with the parent and child together using a coaching modality, which has been found to increase the effectiveness of parenting interventions [14]. Finally, the intervention needed to be feasible for use in a community mental health setting. By establishing the effectiveness of brief parenting interventions in reducing attrition without sacrificing effectiveness, Tully and Hunt's [12] study implicitly gives permission to develop and test brief, more concentrated intervention models as a way to extend the reach of parenting interventions, while underscoring the importance of testing their feasibility and preliminary outcomes, thus contributing to the evidence base for brief interventions.

The purpose of this study is to present treatment and outcome information from an open trial of PC-CARE, a brief (6-week) dyadic parenting intervention for children aged 1–10 years. PC-CARE is based on attachment theories that emphasize the role of caregiver warmth and sensitivity in the development of children's psychological health [17], behavioral theories that address the effectiveness of caregivers' attention as a social reinforcement of children's behavior [18], and social learning theories that point out the power

of children's observation and imitation of their caregivers in establishing behavioral repertoires [19]. We used the approaches of these theories to formulate a brief curriculum designed to increase positive parenting and improve parents' strategies for managing difficult behavior through teaching and coaching.

PC-CARE Core Treatment Objectives

Increase Positive Parenting Skills

PC-CARE teaches, assesses, and coaches parents' use of positive attention for children's appropriate and desirable behavior. Specifically, parents are taught when to use praise, to reflect their children's appropriate speech, to describe children's behavior, to imitate their appropriate play, and to tell the child that they are enjoying their time together with the child. We use the acronym PRIDE (i.e., praise, reflect, imitate, describe, and enjoy) to talk about these skills, similar to Parent–Child Interaction Therapy (PCIT) [20], although some or all of these parenting skills are taught in many interventions, including Helping the Noncompliant Child [21], the Incredible Years [22], and Triple P—Positive Parenting Program [23]. We used PRIDE skills as an expeditious way to teach parents how to give their children positive attention because of research suggesting that parents can acquire these skills quickly and because they form the foundation for effective child behavior management [24]. Hand in hand with teaching and coaching parents to use PRIDE skills, we teach them to let the child lead the play and to *avoid* asking too many questions, giving commands, and making critical comments during playtime (we call these AVOID statements). Asking too many questions can result in the child ignoring the parent's bids for attention or engagement in play, and giving commands can create resistance to the parent's ideas. By avoiding these types of statements, we decrease the likelihood that the child will fail to respond or comply during play and increase opportunities for positive attention. More information on PRIDE skills and AVOID statements is presented in the description of the PC-CARE coding system in the "Method" section.

Improve Use of Calming Strategies

Early in treatment (Session 2), parents and children are taught calming strategies. The exact strategies taught vary according to the child's age and developmental functioning. Caregivers of 12-month olds might be taught to hold and rock their distressed children while softly humming; young children might be taught "flower-birthday cake," where they pretend to breathe in the perfume of a lovely flower, then pretend to blow out all the candles on a big birthday cake; while an older child might be taught mindful deep breathing.

Calming strategies are taught to counteract the effects of trauma-related hyperarousal for children with trauma histories, as well as to increase self-awareness of emotional regulation for all children. In addition to teaching how to stay calm, we teach when to employ these strategies.

Increase Behavior Management Skills

Behavior management skills are incorporated into each session's teaching time (see Table 1). The presentation of skills is designed to build one upon the other, with easy to use skills taught first (e.g., transitions, creating a home environment that supports compliance), followed by more complex skills (e.g., positively framed rationales or incentives using "when-then" or "if-then" sentence constructions to communicate that some activity the child values might follow a less valued activity, and effective commands). The provider constructs situations within the session that allows the caregiver to practice the skills that are taught that session. The activities used in session depend on the types of problems parents are having with the child. For most children, having the caregiver practice switching play activities or cleaning up provides opportunities to practice the skills taught in session. However if a caregiver is having particular problems with trying new foods or brushing teeth, a provider might reenact these challenging situations in the treatment session. Additionally, if a child is resistant to doing homework, the provider might have the caregiver practice behavior management skills while the child is working on a homework sheet.

Description of Intervention and Mode of Delivery

At the start of PC-CARE, we dedicate one session to assessment and orientation to treatment. Providers typically review with caregivers what the goals of PC-CARE are and what will happen each week. They may conduct a typical clinical assessment, as required by their funder, including the administration of a brief child behavior checklist such as the Eyberg Child Behavior Inventory [25] or the Devereaux Early Childhood Assessment [26], and

conduct a semi-structured behavioral observation. Additionally, providers briefly explain how environmental and/or physiological factors (e.g., exposure to violence or traumatizing event, developmental delay, chronic illness) may underlie the development of negative behavior repertoires. Following this, we provide six intervention sessions.

Each 1-h session is broken down into check-in (7 min), teaching parenting skills (10 min), observational assessment (4 min), coaching the caregiver to use the skills taught (20 min), and wrap-up (10 min). In addition to the hour-long treatment session, parents are asked to spend 5 min per day in play with their child and to use the new skills at home throughout the day. Parents document their playtime, skill use, and whether the child had a good or bad day on a "Daily Care" sheet.

Check-In

Parents are asked to complete a brief behavioral screener in the waiting room, before the session begins. During check-in, providers review the behavioral screener and "Daily Care" sheet, talking to the caregiver about how the child has been since the last session and how effective PC-CARE parenting strategies have been for the parent. Children are also involved in the check-in discussion, although they are allowed to play with toys at the same time or contribute to the discussion, as they prefer.

Mini-Didactics

Providers spend 10 min teaching the caregiver and child the "strategies for the day." Children are included in didactics to an age-appropriate degree so that they can learn positive communication skills, understand new parental expectations and behaviors, and learn prosocial conflict management skills when appropriate (e.g., ignore annoying siblings).

Table 1 Session-by-session description of topics taught and coached

Session	Teaching and coaching tasks
Pre-treatment	Collect information (clinical interview, standardized measures); define treatment goals, describe treatment; 12-min observation; teaching on factors underlying child behavior problems (e.g., trauma)
Session 1	PRIDE skills; transitions; creating a compliance-friendly environment
Session 2	Selective attention; redirect; modeling; calming; review PRIDE skills, etc., during coaching
Session 3	Giving rules, choices, positive incentives (e.g., When-then and If-then statements); review earlier material during coaching
Session 4	Giving effective commands, enforcing compliance through removal of privileges; review earlier material during coaching
Session 5	Redoing; review earlier material during coaching
Session 6	Putting it all together- developing your strategies for managing difficult behavior; 12-min behavioral observation

Coding

A 4-min behavior observation is conducted each session. This allows the PC-CARE provider to observe whether and how the caregiver uses the skills he/she has learned, and to see the child's response to the caregiver's use of those skills.

Coaching

Each week the PC-CARE provider encourages the caregiver's use of positive parenting skills and constructs situations that allow the caregiver to practice the behavior management strategies learned in the didactic that week. The provider uses a combination of coaching strategies to encourage caregivers to use and be mindful of opportunities to use their newly-learned skills: they give instructions to the caregiver to do or say certain things, praise their use of the skills, point out the effect that caregiver's use of skills is having on the child, and teach in the moment about the meaning of the child's cues, aspects of the child's development, and how the use of positive parenting skills and effective behavior management supports healthy development. Children are also sometimes included in coaching if it is needed to reinforce skills and promote treatment adherence.

Adjustments for Different Aged Children

PC-CARE can be provided to children as young as 12 months and as old as 10–12 years. The decision to participate in a parenting intervention is a decision the caregiver typically makes with the help of the therapist. However, when working with school-aged children, it is important that the child also participate in the decision to receive services. Both parents and children should understand the purpose of the intervention, that it takes place in the context of the parent and child playing together, and agree together to participate. While PC-CARE providers always try to include children in the teaching and coaching, this is considered essential for keeping the school-aged child and caregiver engaged in the treatment process. Caregivers and older school-aged children for whom playing with toys or games together had no appeal would be counseled toward another therapeutic modality.

Coaching for very young children is adjusted somewhat to teach more about how play is important for developing mental processes such as executive functions, which underlie our abilities to plan, remember instructions, and focus attention. Coaching also helps caregivers understand normal and expected changes in child behavior and how they might adjust their parenting strategies as the child develops. Older children are likely to be involved actively in the treatment process, participating in discussions about different behavior management strategies, and even being coached

in interactions with the caregiver if that helps to advance treatment goals.

Adjustments for Different Diagnostic Populations

PC-CARE can be provided to children with different primary diagnoses, as long as there are parenting concerns that need to be addressed. As an example, a child may have difficulties with feeding and be receiving therapy (e.g., chewing, swallowing) for those problems. At the same time, the parent–child relationship may be in turmoil, with the caregiver being alternately harsh and intrusive, trying to get the child to eat, and the child having a little too much power and control over the parent's attention with refusing (or agreeing) to eat. Improving parenting skills might improve the effectiveness of the occupational therapy. Similarly, children on the autism spectrum or with intellectual or developmental delays can also benefit from a brief parenting intervention that provides support for reducing externalizing behaviors in addition to interventions that target symptoms that are more primary to the diagnosis [27].

Overview of the Current Study

The current study presents results of an examination of performance outcomes collected during an open trial of PC-CARE, a brief (6-week) dyadic parenting intervention for children aged 1–10 years. In addition to examining the treatment participants' improvements in measures assessing child behavior problems, parenting skills, and parenting stress, we also examined the 17 providers' fidelity to the PC-CARE protocol.

Method

Participants

From January 2016 to March 2018, 82 children participated in PC-CARE with their primary caregiver(s). Out of these 82 children, seven caregivers refused to participate in research and nine of the children's files were missing signed consent forms. The dyads refusing or missing consent were more likely to be referred for services by the child's Child Protective Services (CPS) social worker and were more likely to be non-relative foster parents, but otherwise did not differ from consenting participants in children's age, sex, ethnicity, or parents' ethnicity. An additional 2 children from a three-sibling set were screened out of analyses to preserve independence of measurement. The included sibling was selected randomly. Resulting participants were 64 children referred for a parenting intervention because of their disruptive or difficult-to-manage behaviors.

Children's diagnoses fell into five general categories: adjustment and trauma disorders (31%), developmental disorders (6%), ADHD (3%), disruptive behavior disorders (38.5%), and emotional disorders (21.5%). Analyses showed no significant diagnostic differences by age or sex of child.

Of the 64 children whose caregivers agreed to participate in research, 60 completed treatment, yielding a 94% retention rate (analyses including non-consenting families for purposes of program evaluation showed an 87.5% retention rate).

Children ranged in age from 1.3 to 10.9 years, with an average age of 5.52 years ($SD = 2.5$ years). The spread of children across years was fairly evenly distributed, with fewest 1 year olds (5%, $N = 3$) and 10–15% of the sample spread across remaining year categories. Approximately 56% were male. The sample was diverse racially and ethnically: 44% of children were white/non-Hispanic, 19% were African American, 30% were Latino, 2% were Native American, 6% were Asian American. Caregivers were 50% white/non-Hispanic, 13% African American, 27% Latino, 3% Native American, 3% Asian American, and 4% other ethnicities. The majority of caregivers were biological parents (67%); 13% were relative caregivers, 15% were non-relative resource parents (i.e., foster), and 5% were adoptive parents. Caregivers ranged in age from 25 to 65 years, with an average age of 38 years ($SD = 10.6$ years). Services were provided in English for 98% of families and in Spanish for 2% of families, and primarily in a clinic setting (92%). Five children received PC-CARE in their homes.

Referral Sources

Children were referred to our community mental health agency for services to address behavioral problems and associated parent management problems, and parents were offered PC-CARE as a possible fit for their needs. Referral sources were varied, though the majority were self (caregiver) referrals (64%), obtaining services primarily with county assistance. In addition to self-referred clients, children were referred for treatment by CPS social workers (11%), primary care physicians and specialty clinics (14%), schools (5%), and agency therapists and other sources (6%).

Because the clinic also provides PCIT, we needed to be purposeful in deciding which clients should be referred for PC-CARE vs. a more intensive and longer treatment like PCIT. When clients were eligible for both PCIT and PC-CARE, clients may have been referred to PC-CARE ultimately for several reasons: (1) the caregiver would not or could not commit to participate in a 16–20 weeks intervention; (2) the child's behaviors seemed as though they could be easily modified by increasing warmth and structure in the family environment; or (3) the child was receiving individual therapy (e.g., trauma-focused cognitive behavioral therapy)

and needed a supplemental parenting intervention to move forward. In this study, 72% received only PC-CARE services, 14% received PC-CARE before other mental health services, 6% received PC-CARE while receiving other services, and 8% received PC-CARE after completing other services.

Setting

The intervention was provided at a community mental health center that primarily served children with subsidized health care in Sacramento County. The clinic was associated with a university hospital. Rooms designed for PCIT were used to deliver treatment. Consequently, the therapy rooms were furnished with a 2-way mirror and audio/visual equipment. PC-CARE providers conducted didactics in the room and coached caregivers from an observation room behind the mirror, using a single-frequency receiver and earpiece. Children whose families were not able to access clinic services (e.g., no transportation, several young children in the household) could request to receive services in their homes. All components of in-home treatment were the same, except that the therapist coached the caregiver while seated in the same room (e.g., behind or next to the caregiver) rather than from behind a mirror.

Clinicians

Seventeen providers treated the 64 dyads in this study. All were trained to competence in the intervention by being signed off on 25 competencies and completing two cases under the supervision of a PC-CARE trainer. The majority were Master's or Doctoral level, license-eligible mental health clinicians ($N = 14$). Five providers were not yet licensed and received individual clinical supervision from licensed providers, some of whom were also trained in PC-CARE. Three of the providers were not license-eligible clinicians, but were experienced in working with children and families. These three providers worked under the supervision of a licensed psychologist trained in PC-CARE. All providers participated in bi-weekly PC-CARE group supervision.

Measures

Eyberg Child Behavior Inventory (ECBI)

The ECBI [25] is a 36-item scale that measures specific behavior problems exhibited by children aged 2–16 years. Parents indicate the frequency of certain behaviors (Intensity score) and whether they are considered to be problems (Problem score) [28, 29]. The ECBI has been standardized on a number of populations [25, 28]. Test–retest correlations across a 3-week time span on the ECBI Intensity and

Problem scales were 0.86 and 0.88 respectively [30]. The published cut-off scores for child deviance are an intensity score of greater than 131 or a problem score of greater than 16.

Parenting Stress Index, 4th Ed.-Short Form (PSI4-SF)

The PSI4-SF [31] is a 36 item questionnaire that assesses three sources of stress in the parent–child relationship: stress the parent feels because of their own insecurities (parental distress), stress the parent feels as a result of perceived problems in parent–child interactions or in their relationship (parent–child dysfunctional relationship), and stress the parent perceives because of the child’s difficult behaviors or temperament (difficult child). Caregivers respond to 36 questions with a 5-point Likert scale (1 = strongly agree to 5 = strongly disagree). Raw scores are then transformed into percentile scores. Analyses of internal consistency revealed alpha coefficients of reliability of $\alpha=0.90$ for the parental distress scale, $\alpha=0.89$ for the parent–child dysfunctional relationship scale, and $\alpha=0.88$ for the difficult child scale.

Family Demographic Characteristics

Pre-treatment, parents completed the “Brief Family Life Questionnaire” (BFLQ; [32]), which asks parents to provide information about children’s family demographic characteristics, such as ethnicity, household income and composition, and placement length.

Weekly Assessment of Child Behaviors-Negative Behaviors (WACB-N)

The WACB-N [33] is a 9-item measure assessing the frequency of common problem behaviors in children approximately 2–12 years of age and whether the caregiver would like the behavior to change. The assessment yields a severity and need to change scale scores. The internal consistency (i.e., reliability) estimates have shown the severity scale to have $\alpha=0.87$ and the Need to Change scale score to have a Kuder–Rich coefficient (for scales with binomial indicators) of $KR=.79$ [33].

PC-CARE Coding System

The PC-CARE coding system [34] is an observational measure used to code caregiver verbalizations and behaviors. Adapted from the dyadic parent–child interaction coding system (DPICS, 4th Ed.) [35], the PC-CARE coding system is a microanalytic behavioral coding system developed to code parenting skills associated with PC-CARE, as well as child reactions to parents’ questions and commands. There are a total of 15 different codes, distinguishing among

different kinds of verbalizations (e.g., PRIDE skills, AVOID statements), behaviors (e.g., modeling, ignoring), and child responses (e.g., answering, complying). PC-CARE coders code all positive parenting skills that are typically coded separately in DPICS, using one category, “PRIDE skills.” Additional categories of “imitation”, “enjoyment,” “unlabeled praises,” and “reflective questions” are also coded as PRIDE skills, unlike DPICS. In this study, we focused on the parent’s use of verbalizations associated with positive parenting communication (i.e., PRIDE skills), and those we ask caregivers to avoid during playtime (e.g., AVOID statements). PRIDE skills were coded as follows:

- Praise—a positive evaluation of the child, including both nonspecific (e.g., “Nice!”), and specific praise (e.g., “Nice work playing gently with the toys!”).
- Reflections—repetition or rephrasing the child’s appropriate verbalizations (e.g., Child: “I’m building a house.” Parent: “You are building a house.” Or, Parent: “You’re building a house?”).
- Imitation—an overt statement indicating that the caregiver is following the child’s lead (e.g., Parent: “I’m driving my car just like you.”).
- Behavioral descriptions—a non-evaluating description of the child’s behavior (e.g., Parent: “You are drawing a rainbow!”).
- Enjoyment—a verbal expression of positive feelings about the current situation that would not be considered praise (e.g., “I’m having fun playing with you.”).

AVOID statements during playtime were coded as follows:

- Questions—parental inquiries or statements with a rising inflection at the end or having the structure of a question (e.g., “What are you building?”).
- Commands—verbal directions the caregiver gives to the child that indicates that the child should do something.
- Negative talk—parental commands that contain the words no, don’t, stop, quit, or not (e.g., “Don’t be so rough with the toys.”), as well as negative evaluations of the child (e.g., “You’re being a brat.”).

Children’s responses to questions were coded as “answered” (i.e., the child’s response was clearly related to the content of the question), “not answered” (i.e., no response or response was not relevant to the question), or having “no opportunity to answer” (i.e., the caregiver spoke again before the child had time to respond to the question). Children’s reactions to commands were coded as “comply” (e.g., child completed the directed behavior within 5 s), not comply (e.g., child did not begin the directed behavior within 5 s of the command), or no opportunity to comply

(e.g., caregiver gave a second command less than 5 s after the first, gave a command with no obvious way to determine whether it was followed—“look,” or completed the task for the child).

Providers received approximately 3 h of coding training and needed to code 10 times with 80% reliability with their trainer in order to be considered “competent.” Once reaching coding competence, providers coded bi-weekly during team meetings in order to maintain fidelity in coding. Providers’ codes are used in this study. Research assistants, who also reached competency standards, recoded approximately 15% of video recordings of sessions. Results of intraclass correlational analyses between providers’ codes from live sessions and research assistants codes from the session’s video recording for PRIDE skills showed reliability at $\alpha=0.80$ and for AVOID statements at $\alpha=0.91$, both of which demonstrated acceptable levels of reliability.

Design and Procedures

Study Design

This study is an open-trial of PC-CARE in a clinical population of children with their primary caregivers. A pre- to post-treatment comparison design, repeating measures, is used to assess preliminary outcomes for the intervention. The study design and consent forms were approved by the university’s Institutional Review Board. Providers obtained informed consent from caregivers (and legal advocates if the child was a dependent of the court) and informed assent from children over the age of 6.

PC-CARE Procedures and Fidelity

As described above, the intervention consists of 6 treatment sessions and one pre-treatment session for assessment and orientation to treatment. Each treatment session begins with an assessment of caregiver-child functioning

(caregiver report and observational assessment) and a 10-min teaching to caregivers and children on the skills for the week. Following these, if the family was seen in the clinic, the provider coached the caregiver through a bug-in-the-ear device from the other side of a two-way mirror. (If a family was seen in their home, providers coached from behind or to the side of the parent.) Providers coached caregivers (and occasionally children) for approximately 20 min, giving opportunities for them to practice the skills they just learned in the didactic training.

Table 2 describes the fidelity assessments of selected treatment sessions to these fundamental aspects of the PC-CARE protocol. Clinic sessions were typically video recorded, allowing an assessment of fidelity across cases. At least one session was randomly selected from each dyad receiving clinic-based services ($N=60$) and reviewed for fidelity. We measured the amount of time spent conducting the didactic, whether the specified didactic topics were provided, and the amount of time spent coaching. In order to ensure reliability among those evaluating fidelity, research assistants received training in how to measure sessions’ fidelity factors. We recoded ten of the sessions that had been coded for fidelity to estimate the reliability of fidelity coders. Intraclass correlation coefficients of time measurements and coding frequencies were all at least $r=.95$ or higher, and binomial measures showed between 90 and 100% agreement on codes of the presence vs. absence of different didactic topics, suggesting high coding reliability. The results of analyses of fidelity showed that each sessions’ topics were highly likely (87%) to have been covered in that session, that the amount of time spent in the “10-min” didactics was acceptable, averaging 9.7 min ($SD=4.0$) and ranging from 3 to 19 min. The average time spent coaching (target time 20 min) at each session ranged from 6 to 35 min, with an average of 17.6 min ($SD=6.0$) being spent in coaching across all treatment sessions.

Table 2 Fidelity of treatment provision to the PC-CARE protocol—content of teaching, time spent teaching and coaching by session

Session number	% of didactic topics covered	No. of topics	Average mins.—didactic	Average mins.—coaching
Pre-treatment ($N=8$) ^a	75	1	10.1 (4.0)	—
Session 1 ($N=7$)	95	3	11.7 (4.5)	14.4 (4.7)
Session 2 ($N=11$)	96	4	9.8 (3.8)	17.9 (5.5)
Session 3 ($N=14$)	93	4	9.0 (3.0)	19.7 (6.8)
Session 4 ($N=8$)	93	3	13.1 (3.2)	16.5 (3.8)
Session 5 ($N=6$)	79	3	5.3 (2.7)	20.3 (5.6)
Session 6 ($N=6$) ^a	83	3	7.9 (3.6)	10.1 (1.9)
Total ($N=60$)	89	17	9.7 (3.8)	17.6 (6.0)

^aSession also includes a 12-min observational assessment

Dosage

Out of the 64 caregiver-child dyads participating in PC-CARE, 60 completed the 6-session intervention (92%); two dyads completed 1 treatment session, one completed 3 sessions, and one completed 4 sessions. On average, participants completed PC-CARE (from the pre-treatment assessment to the final session) in 77.8 days ($SD = 29$ days); 48% of participants completed PC-CARE in 70 or fewer days; 83% completed in 100 days or fewer.

Multivariate Analysis Strategy

All dyads that completed PC-CARE ($N = 60$) were eligible for inclusion in the analyses described below. However, sample sizes varied because the ECBI and WACB could only be administered to children 2 years and older: 57 participants were eligible for analyses of these measures.

To assess pre- to post-intervention change, we conducted repeated measures analysis of variance, with assessment point as the repeated measure. We used an alpha of 0.05 in all analyses. Analyses of the ECBI and PSI4-SF were conducted separately since children under two could only be administered the PSI4-SF. An average sample size of 55–60 in our analyses of treatment effects was sufficient to detect medium effect sizes with a power of 0.80. In addition to the observed power of treatment effects, we presented η^2 (eta-squared) for analyses of variance and ϕ (phi), statistics that indicate the proportion of variance accounted for by membership in the designated groups (i.e., the between-subjects factor). Eta-squared is roughly the square of f , the statistic measuring effect size in analyses of variance. A small effect size for an analysis of variance is $f = 0.10$ ($\eta^2 = 0.01$), a medium effect size is $f = 0.25$ ($\eta^2 = 0.06$), and a large effect size is $f = 0.40$ ($\eta^2 = 0.16$). In a 2×2 cross-tabulation, ϕ is equal to the effect size indicator, w in which a small effect size is $w = 0.10$, medium effect size is $w = 0.30$, and large effect size is $w = 0.50$ [36].

In assessments of weekly measures of change, we maximized the data we had for all completing participants by using the last observation carried forward (LOCF) method to impute any missing data points. This method is judged to be the best method for imputing missing data in repeated measures designs [37]. In assessments of weekly change, the last non-missing weekly WACB-N score or PC-CARE code was carried forward for each missing data point. This strategy is a conservative method for estimating positive change but also assumes that the scores will not worsen over the week(s). Only 5 data points were missing from the Week 6 WACB severity and need for change scores, which is a rate of approximately 4%.

Results

Pre-treatment Descriptive Statistics

Child Behavior

Parents of 1 year old children were not administered the ECBI and one child was missing pre-treatment scores, resulting in an $N = 56$ for the following analyses. Results of descriptive analyses showed that 67% of the 2–10 year old children entering PC-CARE ($N = 56$) were rated as having clinically significant behavior problems on the ECBI intensity scale and 69.6% were rated as having clinically significant behavior problems on the ECBI Problem scale at the pre-treatment assessment (intensity scale: mean raw score = 140.9 ($SD = 32.1$); problem scale: mean raw score = 16.6 ($SD = 7.6$)). Approximately half of children (52%) were reported as having behavior problems within one standard deviation of the clinical cutoff and 18% were more than a standard deviation above the clinical cutoff.

Parental Stress

Parents of all children were administered the PSI4-SF. However one child was missing pre-treatment scores from each of the subscales, yielding an $N = 59$ for these analyses. Stress from the parent role, measured by the PSI4-SF showed that the average amount of stress caregivers reported from having to manage the child's difficult behavior, as a result of the parental distress, or dysfunction in the parent-child relationship was in the normal range, on average (parent distress scale: mean $\%ile = 56.2$ ($SD = 26.7$); P-C dysfunction scale: mean $\%ile = 61.1$ ($SD = 26.7$), difficult child scale: Mean $\%ile = 76.5$ ($SD = 25.1$)). Although the mean score for the difficult child scale was in the normal range, 44% of caregivers reported clinical levels of stress (i.e., at or above the 90th percentile) from having to manage the child's difficult behavior.

Pre- to Post-Treatment Changes

Preliminary multivariate analyses of covariance were conducted to determine whether children's age or gender should be included as covariates in analyses of pre- to post treatment changes. Neither variable significantly predicted outcome variables nor related to change measured across assessment point, hence were not included in subsequent analyses.

Child Behavior

To determine the significance of the change in children's problem behaviors from pre- to post-treatment, we conducted a repeated measures multivariate analysis of covariance of ECBI Intensity and Problem scales, with assessment

point as the repeated measure and covarying an indicator of the severity of pre-treatment scores to determine whether an equivalent degree of change would be observed for children with more severe behavior problems. The results of analyses showed statistically significant improvement in the child behavior problems from pre- to post-treatment [overall $F(2, 53) = 36.7, p < .001, \eta^2 = 0.41, \text{power} = 1.0$], but no further variation by the level of pre treatment behavior problem severity (assessment point \times behavior severity: overall $F(2, 53) = 1.50, p = .23, \eta^2 = 0.05, \text{power} = 0.31$). An examination of individual F-statistics showed significant improvement in the intensity of problem behaviors [intensity scale: $F(1, 54) = 36.7, p < .001, \eta^2 = 0.41, \text{power} = 1.0$; pre-treatment- $M = 138.5$ ($SD = 35.1$), post-treatment- $M = 112.6$ (35.0)] and in the number of behaviors considered to be a problem [problem scale: $F(1, 54) = 4.6, p = .04, \eta^2 = 0.08, \text{power} = 0.55$, pre-treatment- $M = 16.6$ ($SD = 7.6$), post-treatment- $M = 13.8$ (8.7)]. A closer examination of the magnitude of reported improvements in the frequency of child behaviors showed that 50% of caregivers reported decreases on the intensity scale of greater than one standard deviation on the normalized distribution (i.e., more than the 30 points needed to move from a T-score of 70 to a T-score of 60), 27% of caregivers reported decreases of 0.5 to 1.0 standard deviation, and 23% of caregivers reported decreases of less than 0.5 standard deviation according to the normalized distribution. While 69.6% of children were reported to have behavior problems in the clinical range pre-treatment, 37.5% of children were reported to have problems above the clinical cutoff by session 6.

Parenting Stress

A repeated measures multivariate analysis of covariance was performed to examine pre- to post-treatment change in three sources of parenting stress as measured by the PSI4-SF: parental distress, difficult child behavior, and dysfunction in the parent-child relationship, covarying whether parents reported clinical levels of stress from the difficulty of parenting the child. Results of analyses showed statistically significant improvement in parenting stress [overall $F(3, 55) = 6.03, p = .001, \eta^2 = 0.25, \text{power} = 0.95$], but as in the analysis of child behavior problems no further effects by level of stress from parenting a difficult child (assessment point \times stress severity: overall $F(3, 55) = 0.17, p = .92$). An examination of individual F-statistics showed significant improvement on the difficult child scale [$F(1, 57) = 18.3, p < .001, \eta^2 = 0.24, \text{power} = 0.99$; pre-treatment: $M = 76.5$ ($SD = 25.1$), post-treatment: $M = 62.7$ (29.6)]; parent-child dysfunctional relationship scale [$F(1, 57) = 7.9, p = .007, \eta^2 = 0.12, \text{power} = 0.79$; pre-treatment: $M = 61.1$ ($SD = 26.7$), post-treatment: $M = 53.6$ (27.1)]; and the parental distress scale [($F(1, 57) = 4.6, p = .04, \eta^2 = 0.08,$

$\text{power} = 0.56$; pre-treatment: $M = 56.2$ ($SD = 26.7$), post-treatment: $M = 50.7$ (29.3)]. While many of the scores for the parental distress and parent-child dysfunctional relationship scales were in the normal range at the beginning of treatment, on average, caregivers reported improvements of approximately 5–13 percentile points [parental distress: mean reduction = 5.5 percentile points ($SD = 19.5$); parent-child dysfunctional relationship: mean reduction = 7.5 percentile points ($SD = 20.7$); difficult child: mean reduction = 13.9 percentile points ($SD = 24.7$)].

Weekly Measures of Change

Child Behaviors

Using the WACB-N, we assessed 2–10 year old children's behavior problems weekly to assess progress in treatment. To examine the trajectory of change, we conducted a repeated measures analysis of covariance, with assessment point as the repeated variable and covarying the severity of children's pre-treatment behavior problems as measured by the ECBI. Results showed significant reductions in the measures of behavior problems over the 6 weeks, but also significant sphericity in the indicators (i.e., the variance of the measures at each assessment point were not equal). We report the F-statistic with the Greenhouse-Geisser correction for the linear decrease in the severity [$F(5, 255) = 7.94, p < .001, \eta^2 = 0.41, \text{power} = 1.0$] and in the number of behavior problems the caregiver said need to change [$F(5, 255) = 3.56, p = .004, \eta^2 = 0.07, \text{power} = 0.87$]. Figures 1 and 2 show the session-to-session changes for the severity and number of problem behaviors needing change, as reported by caregivers.

Using PC-CARE codes for children's compliance and answering from the weekly behavioral observation, we summed the number of non-compliance to a command and no-answer to a question (because of distribution problems with individual codes), and divided it by the total number of commands and questions for which the child had the opportunity to comply or answer, obtaining a "non-response" rate. We conducted a repeated measures analysis of covariance of the resulting rate, with assessment point (i.e., session) as the repeated measure. The result of this analysis showed no significant change in rate of non-response from pre-treatment to the final session [linear model: $F(5, 55) = 0.36, p = .87$]. The average percent of non-response/non-comply to questions and commands hovered around 20% over the course of treatment.

Caregiver Behaviors

The PC-CARE coding system was used to code the number of PRIDE skills and AVOID statements caregivers used

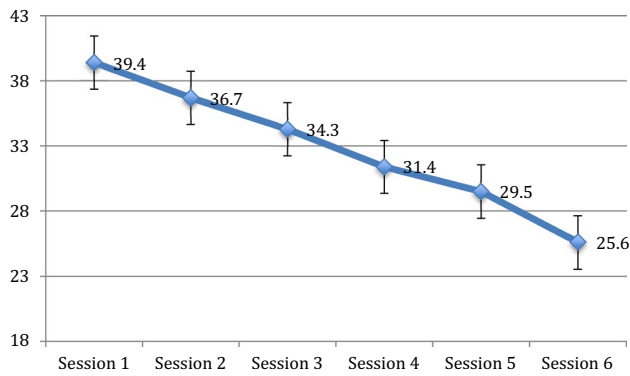


Fig. 1 Mean levels of the sum score of the severity of each of 9 problem behaviors as measured by the WACB-N from session 1 to session 6. Included are scores for children 2–10 years old completing PC-CARE (N=57) using LOCF for missing data points

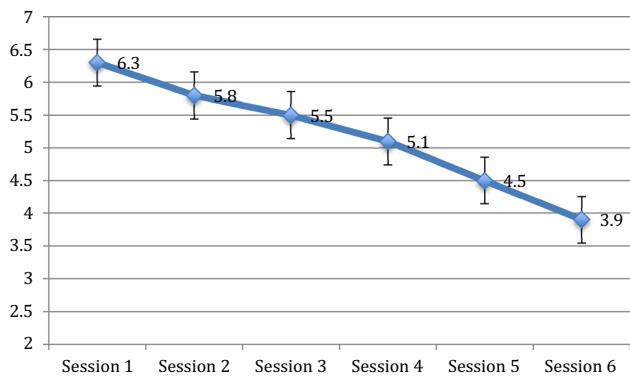


Fig. 2 Mean levels of the caregiver's opinion of how much each of 9 problem behaviors needs to change, as measured by the WACB-N from session 1 to session 6. Included are scores for children 2–10 years old completing PC-CARE (N=57) using LOCF for missing data points

in the first 4 min of the pre- and post-treatment observational assessment, and in each of the 4-min observational assessments each session. We conducted repeated measures analysis of variance, with assessment point as the repeated measure, examining the significance of change from pre-treatment to the final assessment. As with the analysis of WACB score, results of the analysis of the weekly measures of parent behavior showed significant improvements over the 6 weeks, as well as significant sphericity. Hence F-statistics with the Greenhouse-Geisser correction are reported. As seen in Fig. 3, results showed a significant linear increase in the number of PRIDE skills ($F(6, 354) = 20.86, p < .001, \eta^2 = 0.26, \text{power} = 1.0$) and a significant decrease in the AVOID statements parents used from the pre-treatment

assessment to the end of PC-CARE ($F(6, 354) = 11.7, p < .001, \eta^2 = 0.17, \text{power} = 1.0$).

Discussion

The purpose of this study was to examine the initial results of an open trial of PC-CARE, a brief (6-session) parenting intervention, designed to quickly boost caregivers' parenting skills through individualized teaching and in-the-moment coaching to use newly learned parenting skills while interacting with their children. Research has demonstrated the efficacy of parenting interventions in improving children's mental health [8, 14], particularly when they teach and coach the parent to use positive parenting and effective behavioral management techniques [8]. Other research has shown that these interventions can be effective when provided in a brief format [12]. We built on this literature to create an intervention that used proven strategies in a brief, but intensive format provided to individual parent-child dyads in a community mental health setting. While without a randomized controlled trial it is impossible to make the assumption that PC-CARE is responsible for the improvements we observed in behavior problems and parenting stress, we can say that 6 weeks of an intervention was long enough to observe increases in caregivers' use of positive parenting skills and decreases in the frequency of child behavior problems. Furthermore, past research suggests that without any mental health intervention, children's behaviors were generally stable over a 10-month period [38], which lends confidence to our hope that PC-CARE contributed to the changes observed.

We observed significant changes in parenting behavior, and parents' reports of child behavior problems and their

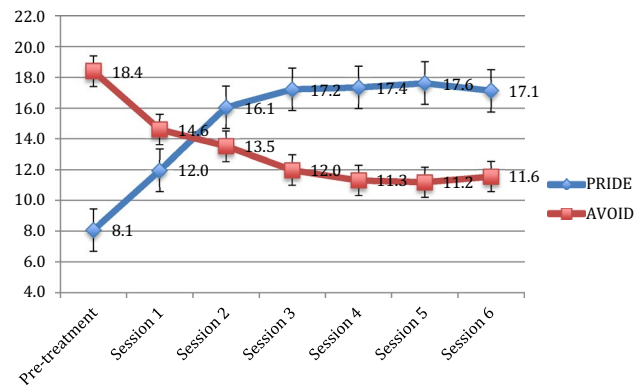


Fig. 3 Mean levels of the caregiver's observed use of PRIDE skills (i.e., praise, reflections, imitating, descriptions of child behavior, and statements indicating enjoyment) and Avoid statements (i.e., commands, questions, negative talk) as measured by therapist's coding. Included are all dyads that completed PC-CARE (N=60)

own levels of parenting stress. Analyses showed no significant effects of children's age, gender, or initial severity of behavior problems on outcomes, suggesting consistent change across age, sex, and symptom severity. However, effects of age and development on outcomes may not be linear. Future research should explore these relationships more carefully. We did not observe significant change in children's non-responses to parents' questions (e.g., ignoring) and commands (i.e., non-compliance) during a 4-min play observation. We acknowledge, however, that the context of this 4-min of observation, child-led free play, may not be ideal for eliciting compliance or responsiveness to questions. Future research should explore predictors of child behavioral change during treatment, examining their connections with the speed of parental skill uptake.

Our design rested on the assumption that parents will quickly take up strategies with which they are comfortable and that work for their child, and that a positive trajectory of change will continue and provide a buffer against future family stressors. We hoped that we also would witness short-term changes in symptoms.

The high rate of clients terminating treatment early observed in more intensive parenting interventions [9] was the primary motivation for developing PC-CARE. Hence one of the goals of this trial was to investigate client retention for the intervention. Analyses showed drop out rates of only 6% among clients that consented to participate in research. These figures exceeded our expectation for this trial.

Related to our ability to retain clients in treatment was our ability to provide this quick-moving intervention with fidelity from session to session. Results of our examination of treatment fidelity showed that a fairly large group of providers were teaching and coaching the skills designated for the session, and roughly in the time allocated for these activities. Comments that PC-CARE providers made during team meetings suggested that they had to make a conscious shift to be more efficient in their communication (teaching and coaching) and of time-use in general. Because past research has reported problems implementing evidence-based treatments developed in a university setting into community mental health settings [39, 40], it is important to point out that the providers providing PC-CARE in this study were not clinical psychology students working in a university lab, but employees in a community mental health center. How a session is conducted is ultimately up to the provider, so their efforts to maintain fidelity suggests that they found value in the brief, structured nature of the intervention. For these reasons, we are encouraged by our findings related to treatment fidelity.

Limitations

One limitation of this study, typical of open trial studies, is that the sample was not randomly assigned to the intervention and had diverse motives for participating in mental health services. There were lower-income clients with Medicare insurance, clients referred by CPS social workers with biological and resource parents, as well as clients referred by their primary care physicians or specialty clinics with private insurance. In addition, the sample differed in the choices of interventions they were offered, mostly because of their insurance status. Some families were referred to PC-CARE over PCIT for clinical or family reasons (the referral decisions were made jointly with the caregiver). In other cases PC-CARE was the only suitable service we were able to offer the family at our clinic. Future research should include a randomized controlled trial and could explore outcomes differences according to referral source and whether PC-CARE is provided as an adjunct vs. stand-alone service.

Summary

The purpose of this study was to conduct an open trial to determine the preliminary outcomes of PC-CARE, a brief, 6-week intervention designed for children 1–10 years with behavioral problems. PC-CARE was designed to bridge the gap between effective brief parenting interventions using a parenting group modality and more intensive individualized interventions working with the parent and child together. The data were collected as part of an open trial and included pre- and post-treatment performance outcomes, weekly information related to treatment progress, as well as measures of treatment fidelity. The retention rate for consenting participants was 94%. Fidelity analyses showed that 17 different providers were able to provide PC-CARE according to the protocol fairly consistently. Results of analyses showed significant improvements in behavioral problems, as measured by the ECBI and WACB from pre- to post-treatment, as well as improvements in parenting stress and positive parenting skills. Findings did not show a significant improvement in children's responsiveness to questions and commands. While analyses showed no significant effects of children's age on pre- to post-treatment change, effects of age may be not linear and warrant further study. The findings suggested that PC-CARE may be a beneficial treatment for children with disruptive behaviors and encouraged the continued research into the efficacy of this brief parenting intervention and its effectiveness in other populations and contexts.

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