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RESEARCH ARTICLE

Working Towards Prevention for Families At-Risk of Child Maltreatment—Meeting Families' Needs through Community Response in Colorado

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Abstract

In the USA, there is a growing emphasis in child protective services (CPS) on prevention for families deemed at-risk of child maltreatment. The Colorado Community Response (CCR) program is one such effort in Colorado to support families to prevent future involvement with CPS. The CCR program is designed to meet family needs, with an explicit focus on economic self-sufficiency and stability. The pilot CCR program was implemented from 2014 through 2017 and evaluated to determine the effectiveness of CCR in preventing child welfare reinvolvement for participating families. By utilizing a pre-post design, it was found that for participating families, the short-term outcomes of protective factors and family functioning across 13 domains were enhanced. Using a matched comparison group, quasi-experimental design and long-term measures of child welfare re-involvement were found to be similarly impacted such that likelihood of subsequently founded assessments and out-of-home placements was significantly less for families who completed CCR services than their matched comparison counterparts. This study adds to a body of evidence that suggests programs and services that provide concrete and economic supports for families can be effective in preventing child welfare (re)involvement.

Keywords Child protective services · Child maltreatment · Prevention · Differential response · Community response · Protective factors

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Introduction

Background

Community Response Origins

Historically, child protective services (CPS) in the USA, also referred to as child welfare, have focused on child maltreatment intervention more so than prevention. However, in recent decades, there has been a growing shift towards moving services "upstream" for families considered at-risk for child maltreatment, with the goal of preventing future maltreatment. A significant structural change to CPS has been to intervene sooner in cases deemed to have low or moderate risk factors; this is known as the differential response (DR). First introduced in the late 1990s, DR allows for a non-investigatory response to screened-in reports of child maltreatment with a focus on family service needs. DR does not result in a substantiation, the official finding of whether maltreatment occurred, nor placement of an identified perpetrator in a central registry. DR addresses the growing recognition that families whose child maltreatment reports are screened in to receive a CPS response have a variety of needs that may necessitate flexible responses beyond what a traditional investigation that focuses on safety and maltreatment risk may provide (Carlson, 2021; Quality Improvement Center on Differential Response, 2014).

As DR (sometimes also referred to as family assessment response or FAR) has expanded internationally and across jurisdictions in the USA, the discussion around providing upstream services has continued, with some jurisdictions exploring serving families with a screened-out referral (an allegation that does not meet the definition of child abuse or neglect). Prior research indicates families with screened-out CPS referrals have a greater likelihood of being re-referred to CPS over time (Drake et al., 2003). In 2020, 45.8% of referrals to CPS in the USA were screened out (US DHHS, 2022b). Thus, the potential preventative impact of the comprehensive and widespread provision of services at the time of screen-out has the potential to impact a great number of families.

One of the first programs to serve this screened-out population, the Parent Support Outreach Program (PSOP), emerged from Minnesota in 2005. Based on meeting family service needs and recognizing the similarities between families whose CPS reports are screened in versus screened out, PSOP created a service pathway for families whose reports to CPS lacked sufficient safety concerns (Loman et al., 2009). Evaluation of PSOP further supported the notion that screened-out families were quite similar to screened-in families, though they were more likely to have lower incomes and higher levels of unemployment (Loman et al., 2009). Other states launched similar pilot initiatives in the mid-2000s, emulating many of the PSOP principles, values, and strategies and naming their efforts community response (CR) or the CPS prevention pathway. Previously, services for screen-outs were limited to information and referral services (Morley & Kaplan, 2011).

Poverty, Maltreatment, and Prevention

The shift towards prevention in the American child welfare context has coincided with an increased acknowledgement that the majority of families involved with the child welfare system suffer from poverty, which is a significant risk factor for child welfare involvement. One study has shown that up to 85% of families investigated by CPS are below 200% of the federal poverty line (Dolan et al., 2011), and many others have highlighted the strong predictive relationship between poverty, indicators of financial instability, and child welfare involvement (Chu et al., 2011; Pelton, 2016; Slack et al., 2011; Yang, 2014). This discussion is complex and nuanced; at its crux is a question of if and how child welfare is equipped to best serve families who are struggling to provide for their own basic needs. Some have asserted that child welfare responses to symptoms of poverty effectively serve to punish families for being poor. This argument has been particularly elevated in discussions around African American and other minoritized families in the USA who disproportionally experience both higher rates of poverty and child welfare involvement generally, and foster care removals, specifically (Detlaff & Boyd, 2020; Fong, 2017; Pelton, 2016; Roberts, 2014; Thomas & Waldfogel, 2022).

The ability to provide for basic needs is crucial to the administration of US child welfare services, as neglect is defined as "a type of maltreatment that refers to the failure of a caregiver to provide needed… care although financial able to do so" (U.S. Department of Health & Human Services, 2022b, p. 130). Indeed, financial problems, inadequate housing, and public assistance receipt are all identified as risk factors for child maltreatment by the federal government (U.S. Department of Health & Human Services, 2022b). In the 2020 *Child Maltreatment* report, which provides comprehensive statistics from each state describing the current landscape of child abuse and neglect across the nation, 76% of all child maltreatment victims (defined as those with a substantiation/indication) were victims of neglect versus 17% for physical abuse, and 9.4% for sexual abuse (U.S. Department of Health & Human Services, 2022b). In 2019, neglect was associated with 63% of removals to out-of-home care, as compared to 13% and 4% of removals associated with physical and sexual abuse, respectively (US DHHS, 2020).

In light of the evidence, addressing the basic and economic needs of families experiencing poverty and economic instability *before* family circumstances create a safety risk is an explicit goal of a growing number of maltreatment prevention programs, such as CR. In fact, the notion of providing "concrete support in times of economic need" has been identified as a key protective factor against child maltreatment in one socio-ecological framework, strengthening families, advanced by the US government since 2007 (U.S. Department of Health & Human Services, 2022a). There is a growing body of empirical literature, which is beyond the scope of this article, that employs the protective factor framework to conceptualize these factors in contrast to maltreatment risk that has demonstrated varying degrees of effectiveness in lowering incidences of child maltreatment (e.g., Austin et al., 2020; Child Welfare Information Gateway, 2014; Harper Browne, 2014; Ridings, et al., 2016; Slack et al, 2011).

Community Response Core Components

Although the CR service model was designed with the flexibility to accommodate unique family circumstances and needs, CR programs tend to have some similar design characteristics across jurisdictions. These core components include the following: (1) a focus on families whose child maltreatment reports are screened out; (2) community-based organizations, rather than public child welfare agencies, tend to be the provider of case management services; (3) intensive outreach and engagement to encourage families to participate in the voluntary service; and (4) an emphasis on strengthening family-level protective factors as opposed to a focus on risk and safety.

Various organizations may deliver CR's case management services, including community-based organizations and public child welfare agencies. Because there can be distrust between the community and a formal child welfare agency, optimal CR delivery should be nested outside of public child welfare and in the community (Loman et al., 2009; Maguire-Jack et al., 2014). In Minnesota, a study examining this relationship found that for families with prior CPS experience, private agency workers were more successful in engaging families in voluntary prevention services when compared to their public child welfare agency counterparts (Loman et al., 2009).

Finally, community response programs explicitly seek to enhance family protective factors, especially concrete needs, through collaborative goal setting and comprehensive case management that leverage community resources and government benefits. This is particularly germane, as family service goals may not match the reasons for the child welfare referral, which was the case with 70% of families in Wisconsin's CR program (Maguire-Jack et al., 2014).

Community Response in the Colorado Context

In 2013, Colorado Community Response (CCR) was implemented as part of a group of child maltreatment prevention programs formed or expanded under then-Governor Hickenlooper's master child welfare plan, "Keeping Kids Safe and Families Healthy 2.0." Modeled after the Wisconsin CR program, CCR's theory of change was to engage families reported to CPS in voluntary services to mitigate the risk of child maltreatment by strengthening families' protective factors, building social capital, increasing financial stability and self-sufficiency, and improving family functioning and well-being. To this end, the CCR program provided comprehensive case management services with a focus on assisting families in accessing concrete services, including one-time cash assistance (i.e., flex funds), by leveraging both formal systems and informal resources to meet their needs. Under the auspices of the then-Office of Early Childhood in the Colorado Department of Human Services, CCR was delivered at 21 sites encompassing 28 counties in rural and suburban areas across Colorado at the time the data collection period concluded in 2018.

CCR was implemented to fill a gap in the child maltreatment prevention continuum in Colorado by targeting voluntary services to families who were reported for child abuse or neglect to CPS, but were either (1) screened out from receiving a response because the report did not rise to the level of imminent safety threat requiring CPS involvement or (2) screened-in and assessed under either the high-risk assessment (HRA) track (known in other states as a child maltreatment investigation) or family assessment response (FAR, the non-investigative track found in DR systems) track and had their cases closed without the provision of ongoing child welfare services. Sites were given discretion in selecting a target population (screen-outs and/or closed assessments) and provider types (county departments of human services or community partners).

Designed as a voluntary and family-focused program, CCR services were based on family-identified goals and were permitted to range in duration from one-time assistance to ongoing services up to 90 days, per program guidelines (Colorado Department of Human Services, 2013). In general, CCR direct service staff were knowledgeable in local resources, skilled in family engagement practices, case management, economic self-sufficiency, and able to integrate the strengthening family protective factors into service approaches. CCR services were primarily provided in families' own homes, or other locations convenient for the individual family. Otherwise, there was a good deal of flexibility inherent to the service model and the service goals were explicitly family-led.

Current Study

During the evaluation period, which ran from November 2014 through March 2018, two cohorts of sites were accepted into the program consisting of single Colorado counties or consortiums of counties. Of the 21 sites, all but one opted to serve both target populations while one larger site served only screened-out cases. CCR provider agencies included county departments of human services (four sites), family resource centers (14 sites), other community-based non-profit agencies (two sites), and one local school district.

The evaluation consisted of both process and outcome components. The process evaluation sought to understand program implementation across the 21 implementing sites, including engagement methods, rates of program uptake and completion, participant satisfaction, and participant and staff perceptions of engagement. The outcome evaluation sought to determine whether CCR was effective in enhancing the short-term outcomes of family protective factors, including social and concrete supports, and other family functioning domains, as well as the long-term goal of child maltreatment prevention, using proxies of subsequent child welfare re-involvement. See Fig. 1. CCR logic model for more information. This article focuses on those short- and long-term outcome measures and their relationship with each other.

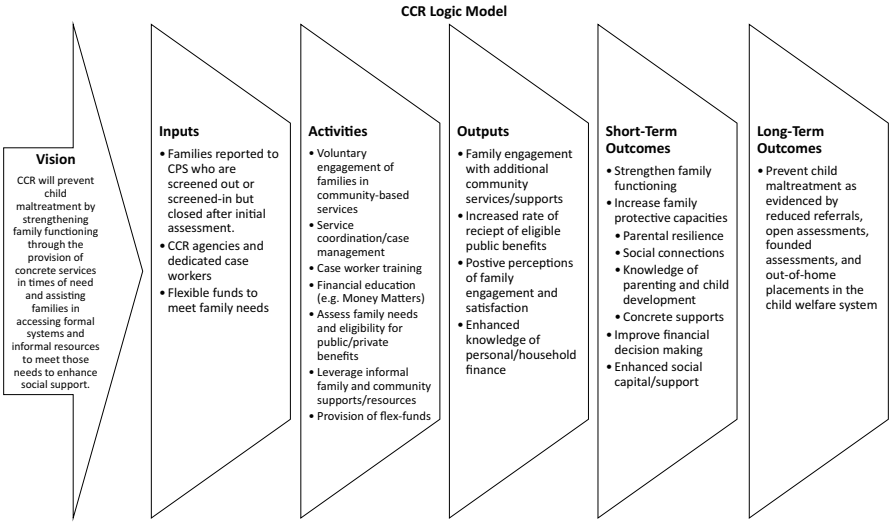

Fig. 1 CCR logic model

Methods

Participants

Given the sheer volume of CPS cases that are either screened out or closed after assessment and given that some of the pilot CCR counties were mid-to-large sized, it is not surprising that the number of CCR-eligible families during the evaluation period far exceeded the capacity to serve them. As displayed in Fig. 2, there were 18,081 families eligible to receive CCR (based on program and site-specific eligibility criteria re: screened-out and closed assessments), but only 8522 of those families were actually referred to CCR for an overall referral rate of 47%. For the 8522 referrals from November 2014 through March 2017, the overall cross-site acceptance rate was 23%, although there was site-level variability ranging from 10 to 48%. In contrast, the cross-site decline/reason for not receiving services rate was 77%. It should be noted that there were passive and active declines. Active declines indicated situations where a caregiver explicitly told a CCR worker that they were not interested in CCR services, which happened 28% of the time across sites. A passive decline indicated a situation where a caregiver was unable to be reached after multiple outreach attempts by a CCR worker or the caregiver was actually ineligible to participate in the program (and had moved out of state or no longer had children living in the home, for example).

A CCR worker documented case closure by the data collection cutoff on March 31, 2017, for 1587 of the 1926 participating families. The rest were still receiving services at that time and thus excluded from the pre-post survey analyses and outcome analyses. An additional 576 families were lost to follow-up for a variety of reasons including disengagement, moving out of the service area, or having a CPS

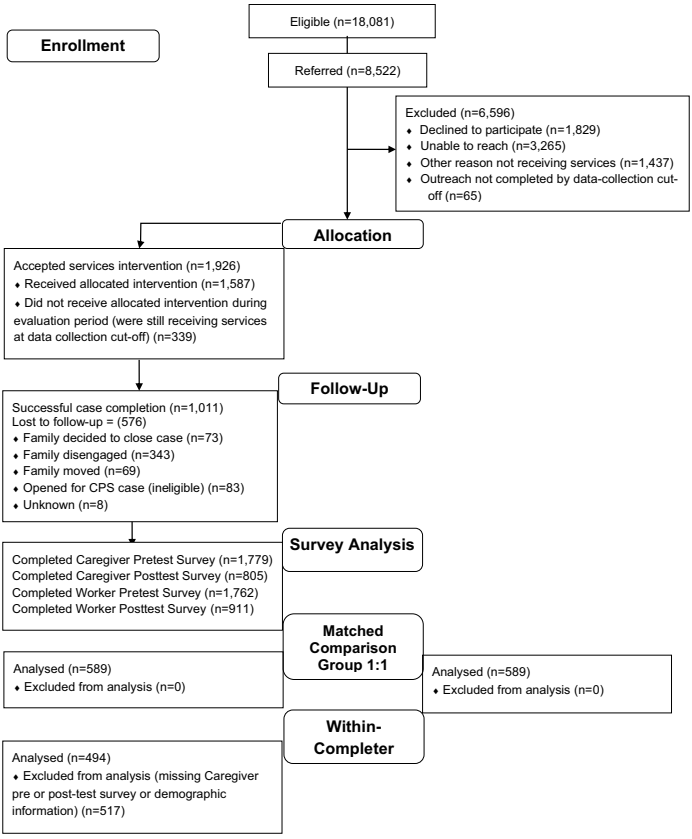

Fig. 2 Participant flow diagram

case opened during the service provision period (as eligibility criteria dictated that CCR services could not occur concurrently with CPS services, CCR services were terminated). This left a maximum "completers" sample of 1011 families. However, matches were only found for 589 of those completers in the 1:1 matched comparison group (MCG) analyses, which limited that analytic sample. Similarly, complete posttest data and demographic data were only available for 494 participants for the within-completers analytic sample.

Measures

Data for this study were gathered from four sources and merged on a unique case-level identifier. First, site-specific referral logs, developed by the evaluators in Microsoft Excel workbooks, and accessed via secure file-sharing technology by each site involved in the study, tracked all CCR referrals from the point of referral until the end of CCR provider involvement. This tracking included all outreach attempts and outcomes (i.e., accepted or declined services), as well as survey completion and

case closure information. These logs were the sole tracking mechanism to understand who received CCR at the sites. Second, all primary caregivers were asked to complete a caregiver survey at intake and again at case closure. These surveys were administered via web-based survey software Qualtrics on CCR staff laptops or iPads or via hardcopy. Caregiver surveys collected information around demographics (pretest only), protective factors, satisfaction (posttest only), and engagement (posttest only). Third, CCR staff completed a web-based worker survey via Qualtrics at both intake and case closure which collected information around family self-sufficiency, an income/benefits inventory, engagement (posttest only), and service provision (posttest only). Finally, administrative data from the state Comprehensive Child Welfare Information System, Trails, provided data around family/case characteristics, which were used for matching purposes in the outcome evaluation, as well as data on child maltreatment outcomes such as re-reports to CPS, substantiations (official findings of maltreatment occurrence), and out-of-home placements.

In regard to the short-term outcomes investigated here, the caregiver surveys captured protective factors changes between pre- and posttest while the worker surveys captured family self-sufficiency. While engagement, service provision, and satisfaction were also assessed, those are reported elsewhere (Allan et al., 2018). For the current analyses, we used the following items or scales from the caregiver and worker surveys.

Protective Factor Survey

The caregiver pre- and posttest included the protective factors survey (PFS), a 20-item survey which has undergone national field testing for reliability and validity for use with families engaged in child maltreatment prevention programs (FRIENDS, 2010). The stated purpose of the PFS is to provide agencies with feedback regarding a snapshot of the families they serve, changes in protective factors, and areas where workers can focus on increasing individual family protective factors. The PFS is designed to be administered as both a pre- and posttest and is divided into five domains: resiliency, social support, concrete support, nurturing and attachment, and child development/knowledge of parenting. Each item is scored on a 7-point scale, with 7 being the most positive response (i.e., strongly agree or all of the time), 4 being a neutral response, and 1 being the most negative response (i.e., strongly disagree or never); some items are reverse-coded. The PFS User Manual (FRIENDS, 2010) recommends calculating the mean score of the items composing a domain to generate the domain's score, with the exception of child development/knowledge of parenting. The developers state that "knowledge of parenting is a complex construct with different components that don't necessarily correlate. For example, knowledge of good disciplinary practices may not correlate with helping your child learn, therefore there is no theoretical reason to expect them to conform to any particular subscale structure." (FRIENDS, 2010, p. 28). As such, the developers recommend using mean scores of individual items to assess change in that area. The four PFS scale domains have internal consistency Cronbach's alpha values ranging from 0.76 to 0.89 (Counts et al., 2010).

Colorado Family Support Assessment (CFSA) 2.0.

The worker pre- and posttest included the Colorado Family Support Assessment 2.0 (CFSA2; Richmond et al., 2017), which is a family-level index of self-sufficiency. The CFSA2 was administered to families by CCR workers using a conversation-style format to identify family assets and areas for growth across 14 domains. Each domain is scored from 1 to 5, where higher scores indicate areas of family strength and lower scores indicate a family need. In addition, each domain includes a "Prevention Line," with scores below the line (either a 1 or 2 for each domain) indicating the greatest potential need for support. The CFSA2 also allows the family to select areas that they are most ready to change and to further assess their readiness to change in each area, which can be used in goal setting with families and may or may not be the same domains falling below the prevention line. However, it should be noted that, in practice, the use and interpretation of the readiness to change section of the CFSA2 varied across CCR sites precluding evaluation of these variables.

Evaluation Design

As previously mentioned, the evaluation team collected and analyzed data for both the short-term and long-term outcome measures to assess the effectiveness of the CCR program in achieving its stated goals. The short-term outcomes were focused on participants of the CCR program only; the measures used to assess these outcomes were only available for families who received CCR. This was a logistical reality as there was no feasible mechanism to gather this information from families who were eligible or referred to the program and who did not engage in services. As a result, there were three different sets of analytical samples utilized in this study: (1) a within-treatment sample which was used for both the pre-post protective factor and family functioning measures, (2) a comparison group design, which was executed via propensity score matching (PSM) of families who received CCR services and their matched counterparts who were eligible but did not receive CCR in their respective counties, and (3) and within-treatment completer analyses, which explored the interactions between change in protective factors and family functioning indicators and subsequent child welfare re-involvement for participants who completed CCR services.

Pre-post Survey Design

Both the protective factor survey and CFSA2 were administered by the CCR worker in order to assess participant perceptions of family protective factors and other domains of family function at baseline (intake) and upon completion of services. Survey completion was built into the CCR program model as required activities for CCR workers at the time of intake and case closure; this was more straightforward for the CFSA2 which was part of the worker survey and less so for the PFS as it was part of the caregiver survey, which was voluntary. In order to maximize response

rates, an incentive was provided in the form of a $20 Visa gift card to caregivers who completed the caregiver survey at both pre- and post-intervals. This approach enabled evaluators to assess change in these perceptions over time through the use of repeated-measures analysis.

Comparison Group Design

In non-randomized designs, treatment and comparison/non-treated groups may differ considerably in their family, household, or case characteristics, leading to challenges in understanding the effect of the treatment or program being evaluated in whatever outcomes may be experienced between groups. Defined as the probability of receiving a treatment given a set of explanatory variables, propensity scores are used to attempt to make the treated and non-treated groups as similar as possible based on observed matching variables when assessing causal effects. In practice, the success of PSM is judged by whether "balance" on the chosen family/household/case characteristics is achieved between the treatment and comparison groups after its use (Biondi-Zoccai, et al., 2011; D'Agostino and D'Agostino, 2007; Newgard, et al., 2004).

Propensity score matching is essentially a three-step analytic procedure. The first step is to identify a set of covariates that will be used to calculate a propensity score and then calculate the propensity score for each subject via logistic regression. The second step is to match treatment subjects to non-treated/comparison subjects on the basis of the estimated propensity score. At this point, the balance of covariates between the treatment group and matched comparison group can be assessed. The third step is the outcome analysis, in which outcomes are compared between the treatment and matched comparison group.

For the purposes of the treatment versus comparison analysis, the treated group consisted of CCR completers. A completer was defined as a family that (a) had a case closure reason of "Services Completed," (b) had a case closure date on or before March 31, 2017, and (c) had an index CPS referral date on or before December 31, 2016. As outcome data were pulled through March 31, 2018, this treatment definition ensured that all treatment families had one full year of follow-up in which to measure long-term child welfare re-involvement outcomes.

Potential MCG referrals were defined as the first referral during the eligibility period among families that (a) did not receive a referral to CCR and (b) had an index CPS referral date on or before December 31, 2016. This allowed for at least 1 year of follow-up plus 90 days in which to measure outcomes for comparison group families. The 1-year follow-up period in which outcomes were measured for the MCG began 90 days after the initial CPS referral date, to account for the time between the referral and CCR service provision for treatment families. The following ten variables were used to match treatment families to comparison group families: (1) referral pathway, (2) number of children in the home, (3) age of youngest child, (4) number of adults in the home, (5) primary caretaker age, (6) number of prior CPS referrals, (7) number of prior CPS assessments, and whether the report included an (8) abuse allegation, a (9) neglect allegation, or an (10) emotional abuse/neglect allegation. A breakdown of specific allegations collapsed into the abuse, neglect, and emotional

Table 1 Allegation categories

Collapsed category	Specific allegation
Abuse	-Physical abuse
Neglect	-Environmental neglect -lack of supervision -Parent substance abuse -drug-exposed child -Medical neglect -domestic violence -Educational neglect -abandonment -Failure to protect -incapable parent -Incarcerated parent -failure to thrive -Child disability -inability to cope
Emotional abuse/neglect	-Emotional abuse -Emotional neglect

abuse/neglect categories is presented in Table 1. It should be noted that sexual abuse allegations, given that they require a child protection investigation response and thus were not eligible for CCR, were excluded. Given differences in child welfare practice and service paradigms across counties, matching took place within counties.

Within-Completer Design

A cross-site within-completers analysis was completed to attempt to identify any characteristics of CCR program completers that might be associated with their likelihood of a subsequent CPS assessment. The goal of this analysis was to test whether certain family or case characteristics impact the effectiveness of CCR in preventing child welfare re-involvement, a proxy for child maltreatment, and to assess whether positive changes in short-term outcomes indicators (e.g., protective factors) are related to a decrease in re-involvement. CPS assessments were utilized as the outcome of interest in this analysis as a balance between subsequent CPS referrals, which is a less meaningful indicator in terms of costly child welfare system re-involvement, and founded assessments or out-of-home placements. While founded assessments and out-of-home placements are the closest approximators to a finding of maltreatment, due to the official finding inherent in a substantiation and the use of out-of-home placements when children cannot be safely maintained in the home, these events are too infrequent to facilitate multiple predictor variables in a model.

Specific factors that were assessed in regard to subsequent CPS assessments included the following: index CPS referral type (screened-out or closed assessments that resulted in the initial referral to CCR); index CPS referral reasons (abuse or neglect); number of prior CPS assessments; CCR provider type (community- versus

CPS-provider agency); demographics including income, caregiver age, caregiver marital status, caregiver race/ethnicity, caregiver education level, number of children and adults in the household; and change in protective factors from pretest to posttest (from the protective factors survey which was administered as part of the caregiver pre- and posttests).

Statistical Methods

Pre-post Analysis

The PFS was administered as pre-post assessment. Pre- and posttest PFS scores for each of the four domains and five standalone items were analyzed at the case level to assess change over time using the Wilcoxon signed-rank test, which accounts for paired samples. The Wilcoxon signed-rank test was used as it is robust for use with outcomes that are non-normally distributed and ordinal (Rosner, 2011, Chapter 9). p-values < 0.05 were considered statistically significant; two-sided Wilcoxon signed-rank tests were used. We also calculated a binary variable for each participant indicating whether the posttest score was higher than the pretest score, as a general indicator of positive change from pretest to posttest across participants.

The CFSA2 was also administered as a pre-post assessment and as a goal-setting tool and was completed by the worker in collaboration with the participant. The participant discussed with the worker which domains (e.g., housing transportation, income mental health) they would like to focus on improving through participation in CCR, and within each area, rated themselves on a scale of 1–5 as described previously. As with the PFS, we compared the change in rating for each domain between the pretest and posttest survey using the Wilcoxon signed-rank test. consistent with the theory of change of CCR, in which the participant sets their own goals, only those domains in which the participant indicated wanting to work on during the pretest were included in the pre-post analysis. In addition to the comparison of numeric scores, we compared the proportion of participants below the prevention line, indicating the need for assistance, from pretest to posttest in domains that participants set as goals using McNemar's test.

Comparison Group Analysis

Treatment subjects were defined as any categorically eligible caregiver completing CCR. Candidates for the non-treated/comparison group subjects were defined as any categorically eligible caregiver who was not referred to CCR following their first stint of eligibility (e.g., their first CPS screen out or closed assessment) during the project period.

Propensity score matching was completed via the gmatch macro in SAS version 9.4 (Bergstralh & Kosanke, 2003), using a greedy matching algorithm. Matching took place at the site level so that each primary caretaker that completed CCR was matched to a non-referred caretaker from the same CCR site.

Due to a number of considerations with evaluation implications, the evaluation team limited the PSM to all but five CCR sites due to the following factors: (a) persistent data quality issues in some sites such that the Referral Log (the source of treatment family data) was not reflective of site practice, (b) some sites did not implement CCR as intended, and (c) the small size of some sites created a scenario in which a substantial majority of eligible families were offered services so that there was not a large enough pool of potential comparison group families from which to conduct the PSM analysis. The decision around which sites to include and exclude was made prior to conducting the analyses.

Upon completion of the propensity score matching process, administrative child welfare data for CCR completers and matched comparison group participants were merged, and binary indicators of subsequent child welfare re-involvement were compared using McNemar's tests, which accounts for pairing between the completer and their matched comparison participant. Child welfare re-involvement outcomes included subsequent CPS referral, assessment (aka screen-in), referral open for services, founded assessment (aka substantiation), and out-of-home placement. Outcomes indicated in child welfare administrative data were included if they occurred during a 1-year follow-up period after the CCR completion date for the treatment group, or during a 1-year follow-up period starting 90 days after the initial child welfare referral for the matched comparison group.

Within-Completer Analysis

After eliminating completers from the five sites with data quality issues, logistic regression analysis was used to calculate odds ratios and 95% confidence intervals on the sample of all other CCR completers through March 31, 2016. The outcome of the analysis was the presence of a subsequently accepted referral within 1 year of CCR completion date. An initial model included only variables from Trails (referral type, reasons, prior assessments, provider types, and caregiver age, number of children and adults in the household) retaining potentially important predictors ($p < 0.10$).

Variables from Trails plus caregiver pretest values (income, marital status, race/ethnicity, education level, and protective factors scores at intake) were then included in a second model. Finally, a third model included demographic variables, caregiver pretest values, and binary indicators of positive change in protective factors domains from pretest to posttest. Income was included in the final model to adjust for baseline income when measuring the change in financial supports. The final model included all completers that completed both a caregiver pretest and a posttest and did not have any missing predictor information ($N = 494$).

Results

Pre-post Analysis Results

Demographics

A total of 1779 unduplicated caregiver pretest surveys were received out of 2057 caregivers who received an intake, reflecting an 86% response rate at the pretest. Responses for the following demographic characteristics of caregivers were collected from those surveys and are reported in Table 2: gender, age group, race/ethnicity, marital status, housing situation, household income, public assistance receipt, and education level. As shown in Table 2, the vast majority of respondents were female and the majority identified as non-Hispanic Whites, which is consistent with the demographics of the primarily rural and frontier counties where CCR was implemented during the pilot. For marital status, 40% of primary caregivers reported being in a relationship and 60% reported being unpartnered.

About 80% of caregivers reported a household income of $30,000 or less per year, with 42% making less than $10,000. For public assistance, participants were able to select all services that applied. Majorities of respondents reported receiving Medicaid (mean-tested government-sponsored health insurance for low-income individuals) and/or Supplemental Nutrition Assistance Program (SNAP; mean-tested grocery assistance); only 17% of respondents reported not receiving any type of the aforementioned categories of economic assistance. Finally, 52% of primary caregivers reported having a high school diploma or less.

Family Protective Factors

As shown in Table 3, approximately 750 caregivers responded to both the pre- and posttest surveys allowing for change-over-time analyses. The average change in responses for each domain/item's mean score between pre- and posttest is listed in descending order of mean change over time. Statistically significant positive change was observed in each domain/item from the pretest to the posttest.

For the four protective factors survey domains, the largest changes were observed in the domains of concrete support and social support, two of the core components of CCR, while a more modest increase was observed in the resiliency domain, and the smallest changes were observed in the nurturing and attachment domains. Table 3 also provides an indication of what proportion of families indicated improvement in each domain or item. For concrete support and resiliency, a majority of families indicated positive change (greater than 50%) between the pretest (intake) and posttest (case closure).

Table 2 Caregiver demographics

	N	%
Gender		
Female	1448	83.3
Male	290	16.7
Age		
< 24	226	13.2
25–29	323	18.8
30–34	407	23.7
35–39	289	16.9
40–44	203	11.8
45–49	124	7.2
50 +	143	8.3
Race/ethnicity		
Native American/Alaskan Native	105	6.0
Asian	13	0.8
African American	44	2.5
Hispanic	549	31.5
Native Hawaiian/Pacific Islander	3	0.2
White (non-Hispanic)	1009	57.9
Other	19	1.1
Marital status		
Married	547	31.4
Partnered	158	9.1
Single	512	29.4
Divorced	295	16.9
Widowed	35	2.0
Separated	195	11.2
Housing		
Own	277	18.8
Rent	875	59.4
Shared housing	152	10.3
Temporary	137	9.3
Homeless	63	4.3
Household income		
$0–$10,000	681	39.7
$10,001–$20,000	381	22.2
$20,001–$30,000	310	18.1
$30,001–$40,000	146	8.5
$40,001–$50,000	90	5.3
> $50,000	106	6.2
Public benefit receipt*		
SNAP	1013	59.3
Medicaid	1244	72.8
TANF	264	15.5
Head Start	119	7.0
None	298	17.5

Self-Sufficiency

Table 4 displays the change in scores for domains on the CFSA 2.0 that caregivers indicated wanting to make a change through CCR. Table 4 also shows the

Table 2 (continued)

	N	%
Education		
Elementary or junior high	75	4.3
Some high school	274	15.7
High school diploma/GED	551	31.6
Trade school	113	6.5
Some college	441	25.3
Associate degree	147	8.4
Bachelor's degree	111	6.4
Master's degree	24	1.4
PhD or other advanced degree	6	0.3

*Percentages total over 100% due to the non-mutually exclusive nature of these categorical variables (i.e., participants could receive multiple benefits at once)

percentage of respondents below the "prevention line" at the pretest and posttest listed in descending order of the number of caregivers wanting to make a change in each domain. The percentage of families below the prevention line decreased in all domains identified by caregivers as key "readiness for change" areas between the pretest and posttest. Furthermore, these results were statistically significant in 13 of the 14 domains. This indicates that there was an improvement in self-sufficiency, over time, for families that completed CCR and that families were motivated to make a change in areas that they were ready for, as opposed to just the areas where they may have fallen below the prevention line.

Comparison Group Analysis Results

Table 5 displays the distribution of matching variables between completers and the matched comparison group. In general, completers and their matched comparison counterparts had similar distributions of matching variables. However, CCR completers were slightly more likely to have an allegation of emotional maltreatment (abuse or neglect) than the comparison group, while the comparison group was slightly more likely to have a non-emotional neglect allegation. In addition, the treatment group was slightly more likely to have become eligible for CCR via referral assigned to the FAR, while the comparison group was slightly more likely to have been assigned to the HRA pathway after the initial referral. The number of adults in the home, the number of children in the home, the primary caretaker's age, and the history of CPS referrals and assessments were relatively evenly distributed between the two groups.

All treatment families received a minimum of three months of service provision, and all families were tracked for a minimum of 1 year, which meets the federal standard for child maltreatment re-reporting. A power analysis was completed based on our new sample size and preliminary findings from a smaller sample of treatment and matched comparison subjects from an earlier time period. Those findings indicated that 4.5% of treatment subjects had a subsequent founded assessment with one year of follow-up compared to 9.0% of matched comparison group subjects. Our

Table 3 Change in protective factors domains/items from pretest to posttest

Domain or item*	*N***	Mean pretest (SD)	Mean posttest (SD)	Mean change	Pre-post *p*-value****	Percent of families with positive pre-post change
Concrete support	751	4.83 (1.62)	5.48 (1.58)	0.65	<0.0001	55.9%
Social support	754	5.39 (1.57)	5.87 (1.20)	0.47	<0.0001	48.7%
Know what to do as a parent*	746	4.56 (1.93)	4.99 (1.80)	0.43	<0.0001	40.6%
Resiliency	751	5.35 (1.26)	5.66 (1.11)	0.32	<0.0001	54.9%
Know how to help child learn*	745	5.66 (1.46)	5.95 (1.34)	0.30	<0.0001	35.0%
Child misbehaves to upset me*	742	4.96 (1.93)	5.17 (1.81)	0.20	0.003	36.7%
Praises child when behaving well*	750	6.23 (1.03)	6.38 (0.95)	0.15	<0.0001	27.3%
Maintain control while disciplining child*	746	6.11 (1.16)	6.23 (1.03)	0.13	0.0004	24.3%
Nurturing and Attachment	750	6.26 (0.84)	6.38 (0.75)	0.12	<0.0001	39.6%

*Indicates a standalone item on the protective factors survey

**Includes only those with valid responses for the item/domain for both the pretest and posttest

***Calculated using Wilcoxon signed-rank test

Table 4 Change in percentage of families below the prevention line on CFSA2 domains from pretest to posttest

Domain	Number wanting to change area*	Average change in 5-point scale	Domain score pre-post change *p*-value**	Percent below prevention line – pre	Percent below prevention line—post	Prevention line pre-post change *p*-value***
Housing	352	+0.68	(<0.0001)	61.9%	33.5%	<0.0001
Employment	290	+0.65	(<0.0001)	69.0%	45.9%	<0.0001
Mental health	283	+0.66	(<0.0001)	39.2%	14.1%	<0.0001
Cash savings	241	+0.27	(<0.0001)	86.3%	76.4%	0.001
Food security	230	+0.59	(<0.0001)	48.3%	13.5%	<0.0001
Income	226	+0.09	(0.01)	96.0%	92.9%	0.05
Transportation	211	+0.77	(<0.0001)	27.0%	8.1%	<0.0001
Adult education	208	+0.14	(0.02)	57.7%	52.9%	0.13
Debt management	204	+0.58	(<0.0001)	70.1%	44.1%	<0.0001
Physical health	165	+0.45	(<0.0001)	37.6%	23.0%	<0.0001
Child education	152	+0.42	(<0.0001)	36.2%	17.8%	<0.0001
Child care	127	+0.89	(<0.0001)	58.3%	16.5%	<0.0001
Health coverage	122	+0.28	(0.002)	42.6%	19.7%	<0.0001
Substance abuse	67	+0.54	(<0.0001)	31.3%	9.0%	0.0006

*Excludes those with a value of missing, N/A, or unknown in either the worker pretest or posttest

**Calculated using Wilcoxon signed rank test

***Calculated using McNemar's test to account for paired measures within individuals

Table 5 Distribution of matching variables between CCR completers and the matched comparison group

Matching variable	Completers ($N=589$)	Matched comparison ($N=589$)
Pathway		
FAR	15.5%	11.2%
HRA	22.9%	26.2%
Screen out	61.6%	62.7%
Number of children in the home		
1 child	36.5%	37.4%
2 children	31.4%	30.9%
3 or more	32.1%	31.8%
Age of youngest child		
1 year old or less	26.0%	24.8%
2 or older	74.0%	75.2%
Number of adults in the home		
1 adult	48.4%	48.4%
2 or more adults	51.6%	51.6%
Primary caretaker age		
Less than 30 years old	34.8%	36.0%
30–40 years old	41.6%	41.4%
41 years old or greater	23.6%	22.6%
Prior CPS referrals		
0 prior referrals	33.6%	33.8%
1 or 2 prior referrals	28.5%	27.5%
3 or more prior referrals	37.9%	38.7%
Prior CPS assessments		
0 prior assessments	47.5%	46.5%
1 prior assessment	18.5%	18.2%
2 or more prior assessments	34.0%	35.3%
Referral included neglect allegation (other than emotional neglect)		
Yes	79.8%	82.8%
No	20.2%	17.2%
Referral included physical abuse allegation (other than emotional abuse)		
Yes	23.3%	19.9%
No	76.7%	80.1%
Referral included emotional neglect or abuse allegation		
Yes	8.7%	6.5%
No	91.3%	93.5%

power analysis of equality of two proportions, assuming a sample size in each group of 589, outcome proportions of 4.5% and 9.0%, and $\alpha=0.05$, indicated that we had a statistical power of 0.843 to detect a significant difference.

As discussed previously, five different child protection outcomes were assessed in the comparison of the treatment and comparison groups: subsequent referral, subsequent assessment, subsequent referral open for services, subsequently founded assessment, and subsequent out-of-home placement. For the CCR completer group,

Table 6 Outcome comparison between CCR completers and matched comparison group

Outcome category	CCR completers ($N=589$)	Matched comparison ($N=589$)	p-value*	Matched-pairs odds ratio**
Subsequent referral				
Yes	247 (41.9%)	229 (38.9%)	0.29	1.15
No	342 (58.1%)	360 (61.1%)		
Subsequent assessment				
Yes	146 (24.8%)	152 (25.8%)	0.73	0.94
No	443 (75.2%)	437 (74.2%)		
Subsequent referral open for services				
Yes	32 (5.4%)	38 (6.5%)	0.53	0.82
No	557 (94.6%)	551 (93.5%)		
Subsequent founded assessment				
Yes	30 (5.1%)	48 (8.2%)	**0.047**	0.61
No	559 (94.9%)	541 (91.8%)		
Subsequent out-of-home placement				
Yes	12 (2.0%)	25 (4.2%)	**0.047**	0.48
No	577 (98.0%)	564 (95.8%)		

*p-value calculated using McNemar's exact test, significance indicated at $\alpha < 0.05$

**Matched pairs odds ratios represent the ratio of discordant pairs in which CCR completers had the outcome to discordant pairs in which their matched comparisons had the outcome

Bolded values were determined to be statistically significant (the p-value indicated was less than .05)

outcomes are included if they occurred within 1 year of the CCR completion date. For the matched comparison group, outcomes are included if they occurred within 1 year of 90 days post-index referral. All subsequent referrals with a sexual abuse allegation were excluded from both the treatment and comparison groups. The results of the outcome evaluation are presented in Table 6.

As shown in Table 6, CCR completers were significantly less likely to have a subsequently founded assessment or out-of-home placement than their matched comparison group counterparts ($p=0.047$ for both outcomes). The three other child welfare re-involvement outcomes, including subsequent referrals (MCG: 38.9% vs. CCR: 41.9%, $p=0.29$), subsequent assessments (25.8% vs. 24.8%, $p=0.73$), and subsequent referral open for services (6.5% vs. 5.4%, $p=0.53$) did not result in statistically significant differences between the completer and matched comparison groups.

Within-Completer Analysis Results

In the initial model including only demographics displayed in Table 7, the number of prior assessments and the caregiver's age were significant predictors of subsequent assessment. Specifically, subsequent assessments were less likely in those with no prior assessments than those with two or more prior assessments, and in caregivers over 40 years of age compared to caregivers under 30. In a second model, including data from Trails as well as demographic and protective factors survey values

Table 7 Predictors of subsequent assessments within 1 year of CCR completion date among CCR completers

Predictors	Initial model* *OR* (95% *CI*)	Second model† *OR* (95% *CI*)	Final model‡ *OR* (95% *CI*)
Number of prior assessments			
0	0.53 (0.35–0.79)	0.57 (0.38–0.88)	0.56 (0.34–0.93)
1	0.90 (0.55–1.47)	1.06 (0.63–1.76)	1.22 (0.67–2.22)
2 or more	Ref	Ref	Ref
Caregiver age category			
Less than 30 years old	Ref	Ref	Ref
30 to 40 years old	0.83 (0.55–1.23)	0.84 (0.55–1.27)	0.83 (0.51–1.35)
Greater than 40 years old	0.52 (0.32–0.85)	0.49 (0.29–0.83)	0.46 (0.24–0.87)
Caregiver income (per category increase)	N/A	0.85 (0.74–0.98)	0.94 (0.80–1.10)
Positive change in concrete support domain (from pretest to posttest)	N/A	N/A	0.67 (0.43–1.04)

*Trails variables only

†Trails variables plus caregiver pretest demographic and protective factors values

‡Trails variables, plus caregiver pretest demographic and protective factors values, plus pre-post change in protective factors

from the caregiver pretest, prior assessments, caregiver's age, and household income at baseline were significant. Caregivers with lower income at baseline were more likely to have a subsequently accepted referral. Pretest protective factors domains, (e.g., resiliency, concrete support, social support, and nurturing) were not significant predictors of subsequently accepted assessments. However, the final model suggests that after adjusting for baseline income, positive changes in concrete support from the pretest to the posttest trended towards lower odds of subsequent assessment, although this finding was not statistically significant ($p = 0.07$).

Discussion

As illustrated by the reported incomes of participating families, the CCR program was successful in targeting economically vulnerable families, the majority of whom were well below the poverty line, federally defined as a household income of $12,060 or less for an individual and $24,600 or less for a family of four in 2017 (U.S. Department of Health & Human Services, 2017). Families who completed the CCR program benefitted by improving multiple domains of family functioning as well as building protective factors from pre- to posttest. For example, statistically significant positive changes were observed from the pretest to the posttest for all five protective factors, with the largest changes observed in the concrete support and social support domains, which represented success in achieving two goals of the CCR program: building social capital and providing concrete supports. Furthermore, the percentage of families below the prevention line decreased in all domains identified by caregivers as key "readiness for change" areas, which indicates that

there was an improvement in self-sufficiency, over time, for families that completed CCR. These results are similar to those of Wisconsin's CR program which found that not only were those families with income-benefit (concrete support) needs more likely to participate in CR services, but that having a service goal related to income was the only statistically significant predictor of goal attainment (Maguire-Jack et al., 2014).

For the long-term child welfare re-involvement outcomes, we found that CCR completers had significantly fewer subsequent founded assessments (substantiations) or out-of-home placements than did their matched comparison counterparts. These findings align with prior findings from the PSOP program which found that, as compared to similar families who did not receive or utilize services, PSOP families were less likely to have subsequent screened-in CPS reports and were re-reported later than non-participating counterparts (Loman et al., 2009).

Together, these findings are consistent with the theory of change for child maltreatment prevention initially developed for the project. Specifically, interventions that support families in a voluntary, non-investigatory context and enhance family protective factors can reduce the likelihood of future child maltreatment. Given the focus of CCR on building concrete supports and economic stability in participating families, this fits solidly into a growing body of literature that indicates child maltreatment can be prevented or reduced when families are able to meet their own basic needs.

Limitations

The CCR study faced numerous limitations which have implications for future studies of the CCR program that can meet evidentiary standards for the Family First Prevention Services Clearinghouse and for the interpretations of program efficacy. First, there was a great deal of variation in the CCR program across sites ranging from the target population, service model, referral processes, assessment approaches, length of service period, and type of CCR provider agency. Such variations were exacerbated by turnover in some sites where adequate staffing became an issue, particularly in smaller sites where there were fewer agency resources to fill in the gaps as staff were lost before new staff could be hired.

Second, the original study design included a randomized controlled trial (RCT) and a matched comparison group design, with designs differing by site. In the RCT design, families were randomized to either be referred to CCR or not referred to CCR. Because the majority of "treatment" families never actually received CCR (the program acceptance rate among those referred was 23%), an intent-to-treat (ITT) approach to analyze the RCT outcomes was of limited utility. As a result, the RCT was replaced by the MCG analysis detailed here using a PSM analysis across all sites, regardless of the initial planned design. This allowed for the most robust, meaningful analysis possible of CCR completers versus a comparison group of families who were never referred to CCR which was preferable due to the significant limitations to the ITT approach given low program uptake. It is also important to note that such low rates of uptake are not uncommon for voluntary prevention programs

such as CCR. Evaluations of similar programs demonstrated rates of initial service acceptance of 49.5% for Minnesota PSOP (Loman et al., 2009) and 54% for Wisconsin's Community Response program in which researchers noted that issues of family accessibility impact family engagement, with other factors such as family mobility contributing to attrition (Maguire-Jack et al., 2014).

Third, there are a number of limitations inherent to the MCG design. Although PSM can match observed variables (i.e., variables for which data is collected), there is the possibility that unobserved variables may differ between the treatment and matched comparison groups (e.g., motivation or willingness to change). This is relevant for any prevention program evaluated using a quasi-experimental design that may be technically reviewed for inclusion in an evidence-based clearinghouse such as the Title IV-E Prevention Services Clearinghouse (Clearinghouse). The Clearinghouse was established by the Family First Prevention Services Act which is a US law passed in 2018 that enables states and territories to use federal funds for prevention services, and is widely anticipated to change the funding paradigm under which child welfare agencies work; the Clearinghouse rate prevention programs as *well-supported*, *supported*, *promising*, or *does not currently meet criteria* which dictates their eligibility for federal reimbursement.

The MCG design limitation is germane to the requirement around demonstrating baseline equivalence. According to the Title IV-E Prevention Services Clearinghouse Handbook of Standards and Procedures (Handbook; Wilson et al., 2019), baseline equivalence must be established for a study to meet the standard of moderate or high evidentiary support, which is necessary to receive a promising or higher rating, and thus to be eligible for reimbursement. Baseline equivalence speaks to, in plain terms, the sameness between treatment and comparison groups at baseline (i.e., at or near the beginning of the intervention). While PSM is designed to create matched treatment and comparison groups that are equivalent on key characteristics, the handbook defines a relatively narrow set of acceptable options for assessing equivalence at baseline that are more stringent than those considered sufficient for a PSM process.

Per handbook standards, baseline equivalence is ideally established using direct pretests. If that is not feasible, two other options are permitted—pretest alternatives or race/ethnicity and socio-economic status. For the CCR study, we were unable to demonstrate baseline equivalence using any of three acceptable methods for the following reasons: (1) direct pretests were only administered to treatment group families due to the logistical and resource barriers inherent in attempting that level of data collection among non-participant families; (2) pretest alternatives speak to measures that are in the same or very similar domain to the outcomes of interest; "they are generally correlated… and/or may be precursors to the outcome" (Wilson et al., 2019, p. 30). While we used prior child welfare involvement (e.g., referrals) for the PSM, it may only be weakly correlated with subsequent founded assessment and case opening with services (the outcomes of interest for the CCR study) and thus is likely not a suitable pretest alternative. In addition, prior child welfare involvement may indicate a level of past family functioning rather than current family functioning and, as such, may not be a true baseline measure. This fact is relevant not only for future evaluation of the CCR program but for child maltreatment prevention

research generally; and (3) for the CCR target population, there is limited race/ethnicity and SES data available in the child welfare administrative data. Specifically, families who are screened out before an assessment do not have reliable race/ethnicity data in Trails, and there are limited SES data currently available in child welfare administrative data systems in Colorado (and many other jurisdictions).

Another limitation to the MCG design is that families that completed CCR may also be families least likely to experience child welfare re-involvement because completing the program is an indicator of motivation to improve their situation, potentially biasing results in favor of the treatment group.

Finally, standard effect sizes for the Protective Factors Survey and CFSA2 are not reported as non-parametric tests were used to assess change from pretest to posttest for these surveys. However, we do report the average change and the corresponding *p*-value from the Wilcoxon signed rank test for each. We did not adjust for multiple comparisons in calculating *p*-values; there continues to be an active debate in the literature about the relative effects on type 1 and type II error rates when adjusting for multiple comparisons, with some advocating for their use and others suggesting they are not needed. Some of the changes from the pretest to the posttest in the PFS and CFSA2 may be statistically significant but less clinically significant, given the substantial power to detect a difference with a large sample size.

While the CCR findings presented here are promising, this evaluation did not use an RCT design, and as outlined previously, some sites were excluded from the outcome analysis due to a lack of fidelity to the CCR model or a very high ratio of families referred to CCR compared to those not referred. Thus, the generalizability of this study is limited. We encourage follow-up studies[1] using more rigorous outcome evaluation designs and fidelity assessments, which would provide stronger evidence for the effectiveness of this type of community response prevention reprogram. We also suggest that community-based participatory research methods may enhance the understanding of the benefits and challenges of CR programs. Qualitative approaches—designed by those who are eligible for CCR and coupled with outcome analyses—may help paint a picture of the human experience of engaging in voluntary programs and services.

Implications

The CCR theory of change is that by engaging at-risk families in voluntary services, the risk of child maltreatment will be mitigated by strengthening families' protective factors, building social capital, increasing financial stability and self-sufficiency, and improving family functioning and well-being. Overall, the CCR study found that families who completed CCR enhanced protective factors, built social capital, increased financial stability, improved family functioning and self-sufficiency, and received concrete supports. Child welfare re-involvement, as measured by subsequently founded assessments and out-of-home placements, was also significantly

[1] A second evaluation of the CCR program utilizing an RCT design is ongoing at the time of submission. Data collection ceased as of June 30, 2021 and findings are anticipated in 2023.

lower for CCR completers than for families with similar demographics and case characteristics who did not complete CCR.

These outcome measures are consistent with the theory of change and suggest that CCR is effective for strengthening families and preventing child welfare re-involvement. Given the significant financial costs, disruption to families, and harm experienced by children and parents related to child welfare involvement, these are encouraging findings. Indeed, a follow-up study using the data from this pilot evaluation found that CCR is a lower-cost prevention model, when compared to other child maltreatment prevention programs (Everson et al., 2021).

Although it would be resource intensive, future research efforts of similar prevention programs may want to consider pre-post surveys on a comparison group that did not receive the intervention to account for potential bias and strengthen findings related to changes in family functioning and protective factors. Not only would that address the issue of baseline equivalence that was previously discussed, but such measures could also be used to improve the analysis of the theory of change mechanism. For example, having pre-post survey data on the comparison group would allow evaluators to assess whether changes in protective factors mediated the relationship between program completion and child welfare re-involvement outcomes. Another area for future research is to conduct a fidelity assessment of CCR, given that CCR services and/or approaches in one site may vary substantially from CCR in another site which may impact program effectiveness in ways that are difficult to quantify using administrative data and survey methods alone.

Data Availability The datasets generated during and analyzed during the current study are not publicly available as participants of this study did not give written consent for their data to be shared publicly. Due to the sensitive nature of the research supporting data is not available.

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