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ORIGINAL PAPER

Feasibility and Preliminary Impact of a Community-Based Intervention for Maternal PTSD and Parenting: Parenting-STAIR Pilot

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Abstract

Trauma exposure and post-traumatic stress disorder (PTSD) impact emotional and physical well-being, social functioning, and parent-child relationship quality. The effect of parental trauma on parenting and child maltreatment is often overlooked by current child welfare (CW) services. The novel intervention, Parenting-STAIR, was created to address maternal mental health, parenting skills, and child well-being outcomes. Parenting-STAIR is a combination of Skills Training in Affective and Interpersonal Regulation (STAIR) Narrative Therapy and Parent-Child Care (PC-CARE). This open pilot study aimed to examine the feasibility and preliminary impact of Parenting-STAIR in reducing maternal PTSD and increasing positive parenting skills for mothers and families involved in the child welfare system. Parenting-STAIR was delivered to 111 mothers receiving family preservation services in New York City. Of these, 70 completed treatment; statistical and clinically significant changes were observed for maternal PTSD and depression as well as in parenting stress, parenting skills, and child behaviors. These findings provide encouraging initial evidence for the feasibility and impact of this novel PTSD intervention. An evaluation of maltreatment recidivism is needed, as well as implementation of a randomized controlled trial to establish efficacy of the intervention.

Keywords PTSD · PC-CARE · STAIR · Parenting · Child maltreatment

Highlights

- This is the first study to examine the feasibility and preliminary impact of Parenting-STAIR.
- 78% of mothers no longer met PTSD criteria at the post-assessment, and 39% achieved full remission.
- Retention was comparable to other trauma interventions with 63% of mothers successfully completing treatment.
- Evidence suggests parenting-STAIR is a feasible and acceptable intervention to reduce maternal PTSD symptoms and improve parenting.

Exposure to maltreatment and other traumatic events during childhood is associated with greater risk of long-term physical and psychological consequences, including increased mental health symptomatology, alcohol and substance use, chronic illness, and shortened life expectancy

Deceased: Claude Chemtob

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(Felitti & Anda, 2010; Gilbert et al., 2009; Nemeroff, 2016). Although evidence is mixed as the causes of child maltreatment are complex and multifactorial and there are a multitude of protective factors which may counteract risk (Widom et al., 2015), maternal trauma increases the likelihood for future maltreatment to occur (Appleyard et al., 2011; Berlin et al., 2011; Berzenski et al., 2014; Child Welfare Information Gateway, 2016). Mothers who have been exposed to trauma, particularly those diagnosed with post-traumatic stress disorder (PTSD), are more likely to report higher parenting stress and are at increased risk of perpetrating child maltreatment (Chemtob et al., 2013; Christie et al., 2019; Cross et al., 2018; Greene et al., 2020). Both maternal PTSD and depression may interfere with mothers' emotional regulation and with parent-child relationship quality (National Research Council and Institute of Medicine (2009); Dib et al., 2019; Erickson et al., 2019; Greene et al., 2020; Lambert et al. (2014)). Relatedly, children of mothers with PTSD are more likely to exhibit externalizing behavioral problems, including aggression, non-compliance, and impulsivity, and internalizing behavioral problems, including social withdrawal, sadness, somatic problems, and anxiety (Baker et al., 2020; Hartzell et al., 2020). The connection between maternal PTSD, parenting, maltreatment, and negative childhood mental and physical health outcomes suggests treatment of maternal PTSD may be an effective means to interrupt further risk of trauma.

Family preservation services (FPS) are offered to families identified by child welfare as maltreating their children who are not immediately removed to foster care. With the goal of preventing maltreatment recidivism, FPS programs seek to preserve families while ensuring child well-being through a combination of safety monitoring, case management, crisis intervention, and parenting classes (Child Welfare Information Gateway, 2022; New York Administration for Children's Services (2022)). There is little evidence, however, that traditional FPS reduce recidivism; maltreatment re-occurrence rates as high as 69% have been reported among participating families (Chaffin et al., 2012; Euser et al., 2015; van der Put et al., 2018).

Evidence suggests there is a strong connection between parental trauma symptoms and adverse parenting outcomes, including risk of maltreatment (Lambert et al. (2014); Savage et al., 2019). Further, trauma exposure and PTSD symptoms in mothers have been linked to poor behavioral health outcomes in their children (Bödeker et al., 2019; McDonald et al., 2019; van Ee et al., 2016). Although maternal trauma exposure and PTSD are risk factors for adverse parenting outcomes and maltreatment, they are often overlooked by preventive services, despite their prevalence in this population (Bunting et al., 2019). One study of mothers involved in the child welfare system found probable rates of PTSD and depression diagnoses at 54% and 62%, respectively (Chemtob et al., 2011). The connection between maternal trauma, maladaptive parenting, and child maltreatment suggests a trauma-informed approach may be more effective at improving parenting and preventing recidivism among highly traumatized, child welfare-involved mothers. Consistent with a wider push for trauma-informed, evidence-based practices in child welfare (Child Welfare Information Gateway, 2020), this paper outlines a novel intervention, Parenting-Skills Training in Affective and Interpersonal Regulation (Parenting-STAIR), to treat maternal PTSD, improve parenting, and prevent maltreatment recidivism. Here, we present data on feasibility and preliminary clinical outcomes of Parenting-STAIR.

Parenting-STAIR seeks to address the complexity of trauma, parenting, and maltreatment through a multidimensional and trauma-informed lens. Parenting-STAIR is a combination of two evidence-based interventions: Skills Training in Affective and Interpersonal Regulation (STAIR; Cloitre et al., 2002) and Parent-Child Care (PC-CARE; Timmer et al., 2019). STAIR Narrative Therapy is an exposure-based trauma treatment involving two components: skill building to target emotion regulation and narrative exposure (Cloitre et al., 2002). STAIR has demonstrated efficacy in reducing PTSD and depression and increasing emotion regulation and social functioning (Jain et al., 2020; MacIntosh et al., 2018). PC-CARE is a dyadic play therapy intervention that focuses on teaching and implementing parenting skills while building secure parent-child relationships. PC-CARE has demonstrated effectiveness as a treatment for increasing placement stability, reducing child behavior problems and increasing effective parenting in child welfare (Hawk, et al., 2020) and improving child outcomes and parent skills in vulnerable Medicare populations (Hawk et al., 2020; Timmer et al., 2019; Timmer et al., 2021). The adaption of STAIR and PC-CARE is innovative in the field of trauma treatment, attending to the interconnection of maternal trauma, mental health, parenting, and maltreatment. To our knowledge, there are no current interventions that seek to reduce maltreatment recidivism by addressing maternal PTSD and parenting together. Parenting-STAIR draws on STAIR and PC-CARE and adds an explicit focus on parenting in relation to trauma; emotional regulation and parenting skills are introduced and used throughout treatment. The current pilot study of Parenting-STAIR was conducted in partnership with four child welfare preventive service agencies in New York City. Following the definition of feasibility put forward by Jackson et al. (2018) and Challacombe et al. (2021) and their colleagues, we considered data on recruitment through our partnering agencies as well as treatment completion to establish feasibility. We hypothesized that

Parenting-STAIR would be well tolerated and that participants would evidence reduced PTSD and depression symptoms, greater emotional regulation, reduced negative parenting, and increased positive parenting. Finally, though Parenting-STAIR does not explicitly target child behavior, we hypothesized that index children would evidence reduced social and emotional problems.

Methods

Participants

Participants were 111 mothers between 18 to 52 who were referred from 4 preventive service agencies in New York City. Participants in the study were 31.11 years old (SD = 6.61) on average. The median number of children for each participating mother was 3. The average age of the index child participating in dyadic sessions with the mother was 4.24 (SD = 1.80). If more than one child was in the age range of 1-8, clinicians determined which child would most benefit from treatment based on their scores on standardized measures of behavior and input from mothers. Most participants described their race/ethnicity as either Black/African American (36.9%), Latina-Puerto Rican (20.7%), or Latina-Dominican (19.8%; see Table 1 for complete data on participants' race/ethnicity). The primary language for 75.7% of participants was English and for 23.4% was Spanish. A large majority of participants were low income, with 78.4% reporting an annual income below 10,000 USD. A majority (73.9%) of participants were unpartnered. All participants met DSM-IV criteria for PTSD. The average number of different categories of trauma endorsed by participants was 5.41 (SD = 1.84). According to the 2017 World Health Organization (WHO) World Mental Health (WMH) survey, 3.2 average trauma exposures per capita were reported across a sample (N = 68,894) from 24 countries (Kessler et al., 2017), suggesting that participants in the present study were highly traumatized on average compared to the general population. The most common index traumas endorsed by participants were physical assault by a known person (43.2%) and child sexual assault (18%). All study procedures were approved by the Institutional Review Board (IRB) at *[blinded for review]*.

All enrolled participants met inclusion and exclusion criteria at baseline. Participants were eligible for inclusion if they: (1) had an open preventive service case at time of enrollment; (2) met DSM-IV criteria for PTSD at pre-assessment; (3) had at least one child in the age range of 1-8, (4) were the primary caretaker and legal guardian of the index child, and (5) could communicate (speak, read, and write) in English or Spanish. Exclusion criteria were: (1) active psychosis at pre-assessment or history of psychosis according to the DSM-IV, (2) experiencing active domestic violence within the last three months if no longer in a relationship with this partner or one year if the relationship is ongoing, (3) pregnant before enrollment, (4) reporting suicidal ideation within the past month on the Structured Clinical Interview for DSM-IV (SCID-IV) or history of suicide attempts during the past year, and (5) diagnosis at pre-assessment of substance abuse and/or dependence in the past month according to the DSM-IV. In addition, the index child must not have: (1) diagnosis of developmental disorder or (2) active psychosis or history of psychosis. All women who acted in the role of a primary caregiver were eligible for enrollment, including aunts, grandmothers, adoptive mothers, and any woman that had primary custody of the participating index child. Mothers were the focus population as this reflects the overrepresentation of women in primary caretaking roles and child welfare (Brown et al., 2009; Scourfield & Coffey, 2002). DSM-IV criteria were used to determine eligibility and in assessments to maintain consistency with an initial phase of this project that started in 2011, prior to the release of the DSM-5. Data from the initial phase of the project (2011-2015) are not reported in this paper.

Measures

PTSD

Clinician-Administered PTSD Scale for DSM-IV (CAPS-IV) Participants were administered the CAPS-IV at pre-, post-, and follow-up assessments. The CAPS-IV is a 30-item semi-structured interview used to diagnose PTSD and describe symptom severity (Blake et al., 1995). Severity scores range from 0-80 with higher scores indicating higher intensity and frequency of PTSD symptoms (Blake et al. (2000)). The CAPS has strong inter-rater and test-retest reliability, high internal consistency, and good convergent validity with the Structured Clinical Interview for the DSM-IV PTSD module (Blake et al., 1995; Foa & Tolin, 2000; Mueser et al., 2001; Weathers et al., 2001). Internal consistency of the CAPS was good in this sample at baseline (Cronbach's $\alpha = 0.85$).

Post-traumatic Diagnostic Scale for the DSM-IV (PDS) The PDS (Foa, 1996) was administered at all timepoints to identify trauma exposures and assess self-reported frequency and intensity of trauma symptoms. PDS-IV is a 49-item self-report measure of PTSD symptom severity with high internal consistency and strong test-retest reliability (Foa et al., 1997). Possible scores range from 0-51 with higher scores signifying more severe PTSD symptomatology; scores between 1-10 indicate mild symptoms, 11-20 indicates moderate symptoms, 21-35 indicates moderate to

Table 1 Baseline descriptive statistics

Variable	Started treatment ($n = 111$)			Completed treatment ($n = 70$)		
	M or %	Frequency	SD	M or %	Frequency	SD
Age of mother	31.1		6.61	32.6		6.68
Age of index child	4.2		1.80	4.3		1.79
Gender of index child						
Female	56.8	63		52.9	37	
Male	43.2	48		47.1	33	
Total number of children (median)	3			3		
Ethnicity/race						
Asian	0.9	1		1.4	1	
Black/African American	36.9	41		32.9	23	
Caribbean/West Indian	3.6	4		4.3	3	
Latina-Dominican	19.8	22		17.1	12	
Latina-Ecuadorian	0.9	1		—	—	
Latina-Honduran	2.7	3		2.9	2	
Latina-Mexican	5.4	6		7.1	5	
Latina-Other	4.5	5		5.7	4	
Latina-Puerto Rican	20.7	23		24.3	17	
Multiple ethnicities/races selected	1.8	2		2.9	2	
White	1.8	2		—	—	
Other	0.9	1		1.4	1	
Primary language						
English	75.7	84		71.4	50	
Spanish	23.4	26		28.6	20	
Other	0.9	1		—	—	
Immigration status						
Documented	12.6	14		15.7	11	
Undocumented	13.5	15		17.1	12	
U.S. citizen	73.9	82		67.1	47	
Relationship status						
Divorced	1.8	2		1.4	1	
Has live-in partner	9.0	10		10.0	7	
Has partner	9.9	11		11.4	8	
Married	7.2	8		10.0	7	
Separated	12.6	14		18.6	13	
Single	58.6	65		47.1	33	
Widowed	0.9	1		1.4	1	
Education level						
Some grade school	8.1	9		12.9	9	
Some high school	36.0	40		35.7	25	
High school graduate	22.5	25		24.3	17	
GED	0.9	1		—	—	
Vocational training	4.5	5		4.3	3	
Some college	20.7	23		11.4	8	
College graduate	7.2	8		11.4	8	
Employment status						
Employed	20.7	23		24.3	17	
Unemployed	77.5	86		75.7	53	

Table 1 (continued)

Variable	Started treatment ($n = 111$)			Completed treatment ($n = 70$)		
	M or %	Frequency	SD	M or %	Frequency	SD
Other	1.8	2		—	—	
Annual household income						
$0–$9,999	78.4	87		75.7	53	
$10,000–$19,999	16.2	18		18.6	13	
$20,000–$29,999	2.7	3		2.9	2	
≥$30,000	2.7	3		2.9	2	
Current homelessness						
Yes	30.6	34		31.4	22	
No	69.4	77		68.6	48	
Total number of traumatic categories endorsed	5.41		1.84	5.46		1.82
Most bothersome trauma reported (PDS-IV)						
Accident	0.9	1		—	—	
Physical assault by known person	43.2	48		47.1	33	
Physical assault by stranger	1.8	2		1.4	1	
Sexual assault by known person	6.3	7		4.3	3	
Sexual assault by stranger	3.6	4		5.7	4	
Child physical abuse	7.2	8		10.0	7	
Child sexual assault	18.0	20		17.1	12	
Witnessing domestic violence	2.7	3		—	—	
Other	16.2	18		14.3	10	

Note. Univariate analyses were performed. Numbers represent either means or percentages

severe symptoms, and scores greater than 35 indicate severe symptoms (McCarthy, 2008). The PDS demonstrated acceptable internal consistency in this sample (Cronbach's $\alpha = 0.65$).

Depression

Structured Clinical Interview for the DSM-IV (SCID-IV) SCID-IV (First et al., 2002) was completed at pre-assessment to evaluate exclusion criteria, including alcohol and substance abuse/dependance and psychosis, and to track depression diagnoses at pre-, post-, and follow-up assessments. SCID-IV is considered the gold standard for determining current and past DSM-IV diagnoses (Drill et al., 2015). Only the depression, alcohol, and substance modules were used, along with the psychosis screen. The SCID-IV has strong psychometric properties (Lobbestael et al., 2011; Zanarini et al., 2000).

Center for Epidemiologic Studies-Depression Scale (CES-D) Depressive symptoms were assessed at all timepoints using the CES-D (Radloff, 1977), a 20-item self-report scale that measures adult depression symptomology. The CES-D has sufficient internal consistency, test-retest reliability, and criterion validity (Carleton et al., 2013; Lewinsohn et al., 1997; Radloff, 1977) and good internal consistency in this sample (Cronbach's $\alpha = 0.81$). Possible scores range from 0 to 54, with higher scores indicating more severe depression symptomatology (Radloff, 1977). A cutoff score of 16 indicates possible major depression (Henry et al., 2018).

Emotional Regulation

Difficulties in Emotional Regulation Scale (DERS) The DERS (Gratz & Roemer, 2004), a 36-item self-report scale, was used at all timepoints to assess emotional regulation. Responses are scored on a 5-point Likert scale from 1 ("almost never [0–10%]") to 5 ("almost always [91–100%]). Higher scores indicate a higher probability of difficulties with emotional regulation; scores range from 36–180 (Gratz & Roemer, 2004). The DERS has acceptable construct validity and good test-retest reliability (Gratz & Roemer, 2004; Hallion et al., 2018). In this study, internal consistency was strong (Cronbach's $\alpha = 0.93$).

Parenting

Parenting Stress Index-Short Form (PSI-SF) The PSI-SF (Abidin, 1995) was administered at pre-, post-, and follow-up assessments to gauge parenting stress. The PSI-SF is a

36-item self-report questionnaire measuring parenting stress with three subscales (Parental Distress, Parent-Child Difficult Interaction, and Difficult Child) used to calculate a total stress score (Allison & Barnes, 1998). PSI-SF has good internal consistency, test-retest reliability, and convergent validity (Barroso et al., 2016); internal consistency was strong in the present sample (Cronbach's $\alpha = 0.91$).

Dyadic Parent-Child Interaction Coding System (DPICS) Dyadic observations using DPICS (Nelson & Olsen, 2018) were conducted following the pre-, second midpoint, post-, and follow-up assessments to evaluate the quality of parent-child interactions. Clinicians read standard instructions for the play and coded utterances in the interaction in real time. DPICS were observed and coded by SMSC study clinicians to produce total positive and negative scores. Positive scores include the number of observed praises, reflections, and behavioral descriptions used during the play session, and negative scores include the number of observed questions, commands, and negative talk. DPICS is administered for 15-minutes in total with three 5-minute sessions focusing on child-directed play (CDI), parent-directed play (PDI), and clean-up (Eyberg et al., 2013).

Child Behavior

Eyberg Child Behavior Inventory (ECBI) ECBI (Eyberg & Ross, 1978) was used at all timepoints to assess disruptive behaviors of the index child. This 36-item measure has two subscale scores for problem and intensity. Problem scores range from 0-36 with higher scores indicating a higher number of parent-identified issues with behavior; raw intensity scores range from 36-252 with higher scores indicating higher frequency of behaviors (Funderburk et al., 2003; Rich & Eyberg, 2001). ECBI has good internal consistency and acceptable test-retest reliability, as well as high concurrent and convergent validity (Boggs et al., 1990; Funderburk et al., 2003; Gross et al., 2007). ECBI is also sensitive to change in treatment and longitudinal and maturation effects (Hutchings et al., 2011; Sofronoff et al., 2011). ECBI demonstrated good internal consistency in this sample for the problem subscale (Kuder-Rich $20 = 0.94$) and the intensity subscale (Cronbach's $\alpha = 0.94$). Kuder-Rich 20 is presented for the problem subscale as it is composed of dichotomous (yes/no) items.

Intervention

Parenting-STAIR includes three phases, comprising a total of 23 modules. Throughout treatment, parenting skills and psychoeducation about the impact of trauma on parenting are introduced and practiced during sessions and participants are assigned daily homework with the identified index child. Barriers to attendance and safety are discussed and noted during all sessions. Phase 1 (modules 1-9) focuses on the development of emotional regulation and interpersonal skills. Phase 2 (modules 10-15) are narrative exposure sessions. Phase 3 (modules 16-23) are dyadic sessions with live coaching, modeling, and practice of parenting skills with the participating mother and index child. Homework designed to guide participants in practicing skills utilized in treatment is assigned after completing each session. A full description of sessions can be reviewed in the online supplement.

Treatment was provided by one of the following: (a) a licensed clinical psychologist or (b) a licensed social worker. Throughout study implementation, at least one clinician was bilingual (Spanish-English) and was able to administer treatment in Spanish. All clinical staff received training on STAIR and PC-CARE. Weekly supervision was provided by a clinical psychologist with expertise in both interventions.

Adapting to the COVID-19 Pandemic

Data collection for this project began in 2016. On March 18, 2020, in-person research activities were suspended by the IRB at New York University due to the COVID-19 pandemic. Between March and July 2020, all new screens, referrals, and consents for the present study were paused as the research team transitioned all materials and procedures to secure, virtual platforms. Our transition during the pandemic focused on continuity of care for participant families and providing emotional support in recognition of the immense disruption to pre-pandemic lives. During this pause, clinicians made weekly supportive calls to participants in treatment and completed pending assessments, virtually. On July 22, 2020, the protocol modifications to accommodate virtual treatment implementation were approved. Prior to resuming treatment, non-protocol sessions were conducted with all continuing participants to set-up necessary technology and review the amended consent forms. All participants had access to at least one device with internet access. Clinicians and participants worked with case planners at preventive services agencies to address WIFI accessibility and any technical troubleshooting.

Procedures

Screening and Informed Consent

As part of usual care at preventive agencies, case planners screen clients for trauma exposure during the intake process. Case planners, or case managers, are mental health professionals who work with clients to maintain and achieve overall socioemotional well-being through (but not

limited to) care coordination, social welfare access, and monitoring of collective care goals (New York State Office of Children and Family Services, 2017). Any clients who endorsed trauma exposure were offered the study flyer and signed the referral, indicating their willingness to be contacted by a member of the study team. Upon receipt of referrals, clinicians conducted brief eligibility screens to evaluate baseline eligibility, including index child age, trauma exposure, and domestic violence incidences. If mothers met initial criteria and agreed to participate, an informed consent session was scheduled. During consent, research staff informed mothers that participation was completely voluntary and involvement with the study had no effect on preventive services or their relationship with Administration for Children's Services (ACS), NYC's child welfare department. Informed consent detailed treatment, potential benefits and risks, confidentiality and limits to confidentiality, use of audio and video recordings, and parental permission for the participation of the index child. If a participant declined any part of the informed consent process, external referrals to outside mental health services were provided with assistance from case planners. Voluntary emergency contact information and relevant service provider information was also collected. Prior to the parent-child assessment, the index child provided their assent to participate.

Assessments

Participants referred for participation in the study were initially assessed to establish eligibility and baseline symptomatology. The pre-treatment assessment consisted of both clinician-administered interviews for diagnosing PTSD, depression, substance use and abuse, and psychosis, as well as self-report measures detailed above. Self-report measures were repeated at the two midpoint assessments, post-treatment, and 3-month follow-up. Clinician administered interviews were repeated only at post and follow-up. Fifteen-minute dyadic observations were completed after the pre-, second midpoint, post-, and follow-up assessments. The pre-assessment and two midpoint assessments were administered by the treatment clinician. Post and follow-up assessments were conducted by a non-treatment clinician. All assessments were conducted in-person at the partner agencies, or, after March 2020, virtually due to the COVID-19 pandemic. All assessments were recorded (both audio and video).

Treatment

Participants who met inclusion/exclusion criteria were invited to enroll in the study. All participants in the study continued receiving usual care preventive services at participating agencies in accordance with ACS guidelines without modification. The intervention consisted of 23 weekly, individual treatment sessions. Each lasted about one hour. Non-protocol sessions were allowed as needed depending on clinical assessment of engagement, participation, and safety. A subsample of participants (N = 15) did not participate in Phase 2 of the intervention (narrative exposure); this decision was informed by clinical considerations for participants with scores of 12 or below on the PDS. All sessions were recorded (both audio and video). Clinicians completed treatment fidelity checklists for manual adherence, which were designed to inform weekly supervision with the clinical director.

Collaborative Communication Model Throughout the intervention, treatment clinicians, participants, and preventive services case planners engaged in collaborative communication to increase engagement and enhance trauma-informed service delivery at all levels. Participant engagement, external mental health referrals or resources, and treatment progress were shared with preventive agency staff to improve the quality of services, overall, for study participants and their families. This approach was detailed in the consent form and acknowledged by all participants as a condition of enrollment. Regular contact with agency staff also provided valuable information about the context of participants' lives in terms of potential stressors or barriers to treatment. Information gathered from interactions with agency staff added to the background conceptualization of each case.

Incentives

Participants were compensated to offset transportation and childcare expenses for all assessment and treatment sessions. Mothers were provided $50 for pre, post, and follow-up assessments, $30 for mother-child dyadic observation assessments, and $20 for each session to offset childcare and other expenses, e.g., snacks for their children. Five-dollar MetroCards were distributed to cover transportation costs. During the pandemic, instead of MetroCards, $5 were added to each assessment and session to account for extra data usage.

Results

Baseline Characteristics

Seventy mothers completed the Parenting-STAIR intervention. Mothers were considered treatment completers if: (1) they completed all 23 modules; or (2) based on PDS scores at mid-assessment 1 and clinical considerations, they

skipped phase 2 and completed all modules in phases 1 and 3 for a total of 15 modules completed. No demographic differences were observed between treatment completers and non-completers (see Table 1). Mothers who completed treatment were, on average, 32.6 years of age (SD = 6.68) with an index child aged 4.29 years (SD = 1.79). Completers had a median of 3 children (range 1-8). The primary language for 50 mothers who completed treatment was English while the primary language for 20 participants was Spanish; 22 participants were partnered at baseline. The overwhelming majority of treatment completers were below the poverty level, with 53 mothers reporting income under $10,000 per year. Completers were also highly trauma exposed, endorsing on average 5.46 (SD = 1.82) different categories of trauma, with physical assault by a known person (N = 33), sexual assault during childhood (N = 12), and physical assault during childhood (N = 7) as the most endorsed categories of trauma. At baseline, all mothers met criteria for PTSD; 38% of our sample also met criteria for comorbid depression.

Feasibility

Service context

Initial pilot results indicate that it is feasible to deliver Parenting-STAIR in the context of child welfare preventive services agencies. During the study period, case planners employed at preventive services agencies screened 818 mothers entering the child welfare system for trauma; of these mothers, 563 endorsed trauma exposure. During the study period, case planners referred 616 mothers for possible enrollment in the study, indicating that case planners valued the intervention. Figure 1 displays the pipeline from referral to enrollment, including reasons why referred mothers were deemed ineligible.

Treatment completion

Of the 111 mothers who met full eligibility criteria for Parenting-STAIR and began treatment, 70 mothers completed treatment, using the definition of treatment completion described above. Attrition from the intervention was 37%. Though there is considerable variability, retention as low as 46-50% has been observed in some studies of trauma-focused interventions (Ehring et al., 2014; McDonagh et al., 2005; Schottenbauer et al., 2008). Meta-analytic findings regarding dropouts from randomized controlled trials of PTSD interventions found that 36% of participants randomized to trauma-focused treatment dropped out (Imel et al. (2013)), suggesting that the attrition rate observed in the present study is consistent with prior work. Reasons for attrition from the present study often included participants feeling overwhelmed by concrete stressors in their lives, busy schedules with work and/or other services, anxiety about discussing trauma, or skepticism and hesitance toward participation. Among those who did not complete treatment (N = 41), attrition from treatment was most frequent during phase 1 of the intervention (63%); 27% and 10% dropped out in phases 2 and 3 respectively.

In an effort to understand factors which may have contributed to attrition, we considered whether mothers who dropped out of treatment may have experienced a sufficient dose of the intervention and significant symptom improvement, as is suggested by meta-analytic studies of attrition in PTSD trials (Imel et al. (2013)). We examined the data from our first midpoint assessment (after module 9) for the 16 mothers who dropped out after this first midpoint assessment. While the CAPS was not administered, scores on the PDS suggest that, on average, mothers in this group had experienced a significant decrease in trauma symptoms (pre: M = 32.43 [SD = 6.68]; midpoint one: M = 23.06 [SD = 9.37]; $t(15)=3.33$, $p < 0.05$). We also considered the possibility that the COVID-19 pandemic may have contributed to increased attrition. Mothers that completed treatment before the beginning of the pandemic were slightly less likely to drop out; attrition pre-pandemic was 34% compared to 48% attrition for mothers who participated in some or all modules during the pandemic. For mothers that completed treatment, their average duration in treatment was 39 weeks, ranging from 12 weeks to 89 weeks.

Clinical Outcomes

As the present study was an open trial to evaluate feasibility and preliminary impact of Parenting-STAIR, no comparison group data were collected. Clinical outcomes were measured at two midpoint assessments (after module 9 and after module 15), post-test, and 3-month follow up. Results of two-tailed paired sample *t* tests comparing pre- and post-treatment scores are displayed in Table 2; results are presented for all treatment completers and for only those mothers who did not complete Phase 2 of the intervention. In both the total sample and the smaller sample who did not do Phase 2, findings indicate significant improvements from baseline to post-test across all outcomes measured, including measures of mothers' PTSD symptoms (CAPS and PDS), depression symptoms (CES-D), emotion regulation (DERS), and parenting stress (PSI), as well as positive and negative parenting (DPICS), and child behavior (ECBI). In the total sample, the mean CAPS score at pre-test was 72.26 (SD = 16.54) decreasing to 29.67 (SD = 23.40) at post-test (all means displayed in Table 2). In the total sample, all Cohen's *d* effect sizes were large, apart from improvements in emotion regulation ($d = 0.7$) and one sub-measure of the ECBI (problem score; $d = 0.7$), which were in the medium

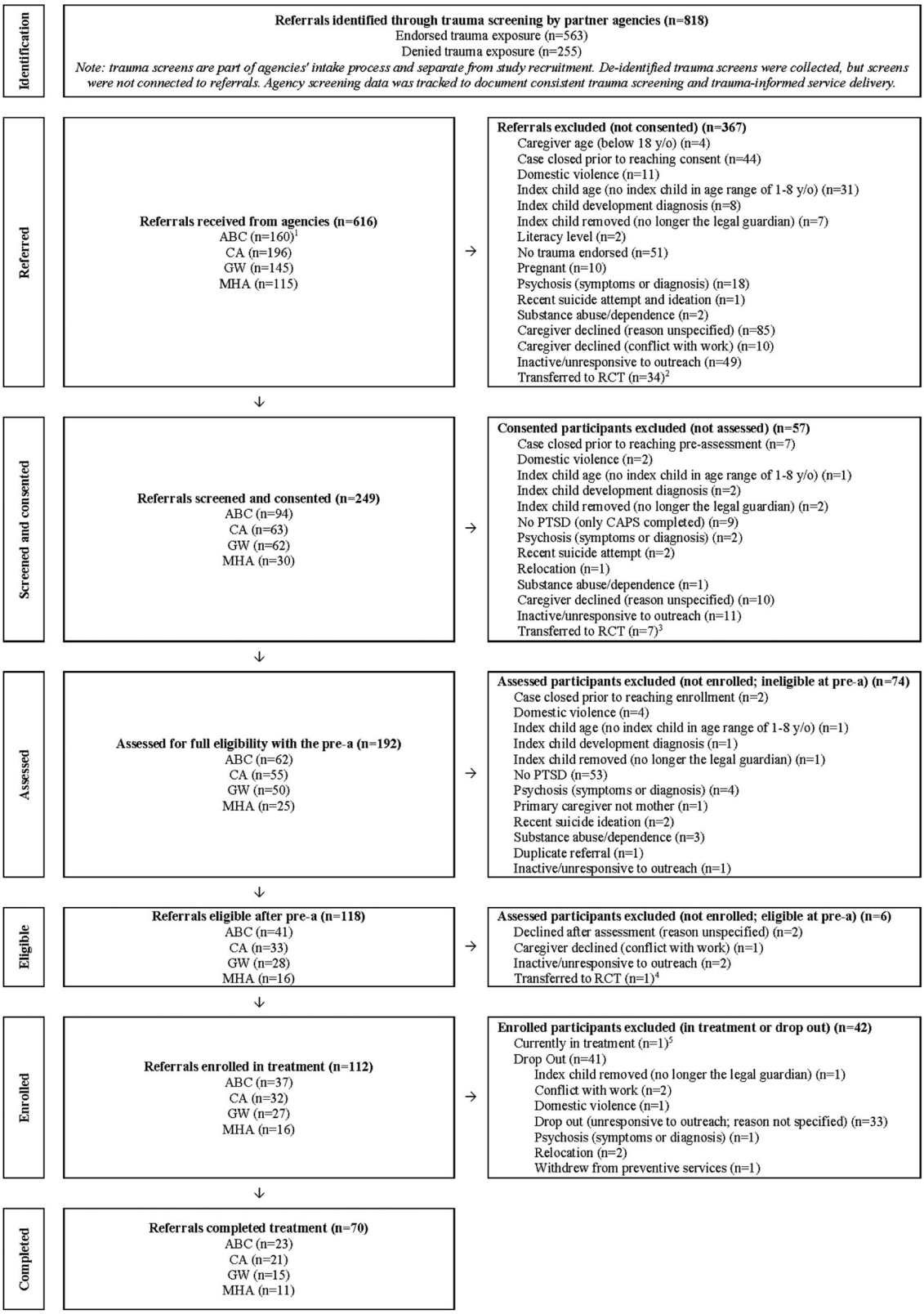

Fig. 1 Screen to treatment completion pipeline. [1]Association to Benefit Children (ABC), Children's Aid (CA),Graham Windham (GW), and Vibrant Emotional Health, formally known as Mental Health Association of NewYork City (MHA) were the four preventive service agencies referral partners. [2–4]These referrals were received after the notice of award for the P-STAIR randomized controlled trial, but before starting treatment. [5]This enrolled participant was still in the process of completing treatment in the pilot at the time of data analysis for this paper

Table 2 Clinical outcomes (Pre to Post)

	Baseline				Posttreatment				Pre-Post Total Score*							
	Total		No Phase 2		Total		No Phase 2		Total				No Phase 2			
	M (SD)	*n*	*M (SD)*	*n*	*M (SD)*	*n*	*M (SD)*	*n*	*t*	*df*	*M (SD)*	*Effect Sizes (d)***	*t*	*df*	*M (SD)*	*Effect Sizes (d)***
PDS[a]	32.61(6.88)	61	31.67(5.69)	15	12.89(8.99)	61	9.80(7.62)	15	15.44†	60	19.72(9.97)	2.0	8.15†	14	21.87(10.39)	2.1
CAPS[b]	72.26(16.54)	61	68.53(12.56)	15	29.67(23.40)	61	21.60(18.91)	15	14.61†	60	42.59(22.76)	1.9	8.89†	14	46.93(20.44)	2.3
DERS[c]	65.66(23.41)	61	64.07(17.89)	15	53.11(18.26)	61	49.60(13.11)	15	5.29†	60	12.54(18.51)	0.7	4.68†	14	14.47(11.98)	1.2
CES-D[d]	31.13(9.63)	61	31.40(5.95)	15	14.79(12.12)	61	11.00(11.50)	15	8.91†	60	16.34(14.33)	1.1	6.31†	14	20.40(12.52)	1.6
PSI[e]	93.79(22.38)	61	93.33(22.35)	15	72.84(22.01)	61	65.27(19.75)	15	7.92†	60	20.95(20.65)	1.0	4.39†	14	28.07(24.74)	1.1
ECBI[f]																
Problem	12.61(9.62)	61	11.60(8.78)	15	7.48(8.24)	61	4.27(5.50)	15	5.71†	60	5.13(7.02)	0.7	3.52†	14	7.33(8.07)	0.9
Intensity	115.82(51.21)	61	106.53(38.78)	15	82.0(42.16)	61	67.27(23.75)	15	7.28†	60	33.85(36.36)	0.9	4.80†	14	39.27(31.71)	1.2
DPICS[g]																
Positive	17.82(13.81)	61	17.44(13.77)	16	36.87(22.40)	61	40.38(24.26)	16	6.57†	60	19.05(22.63)	0.8	3.52†	15	22.94(26.06)	0.9
Negative	92.48(39.05)	60	86.69(43.49)	16	55.57(27.05)	60	48.44(22.92)	16	6.63†	59	36.92(43.12)	0.9	3.51†	15	38.25(43.57)	0.9

Note. No phase 2 columns represent the participants who only completed phase 1 and phase 3 of Parenting-STAIR

*Paired Samples Test comparing pre- and posttreatment ratings

**Paired Samples Effect Sizes (Cohen's d) comparing pre- and posttreatment ratings

†t significant at $p < 0.05$

[a]Post-traumatic Diagnostic Scale for the DSM-IV. Possible scores range from 0–51 with higher scores signifying more severe PTSD symptomatology

[b]Clinician Administered PTSD Scale for the DSM-IV. Severity scores range from 0–80 with higher scores indicating higher intensity and frequency of PTSD symptoms

[c]Difficulties in Emotional Regulation Scale. Possible scores range from 36–180 with higher scores suggesting greater difficulty with emotional regulation

[d]Center for Epidemiological Studies-Depression. Possible scores range from 0–60 with higher scores denoting more depressive symptoms. 16 or greater is the cut-off score for identifying risk of MDD

[e]Parenting Stress Index-Short Form. Total stress raw scores range from 36–175 with higher scores associated with higher levels of parenting stress

[f]Eyberg Child Behavior Inventory. Raw problem scores range from 0–36 with higher scores connected to higher number of parent-identified issues with behaviors. Raw intensity scores range from 36-252 with higher scores indicating higher frequency of disruptive behaviors

[g]Dyadic Parent-Child Interaction Coding System. Positive scores include the number of observed praises, reflections, and descriptions used during the play session. Negative scores include the number of observed questions, commands, and criticisms. DPICS are administered for 15-minutes in total with three 5-minute sessions focusing on parent-directed play (PDI), child-directed play (CDI), and clean-up

range. In the subsample of mothers who did not complete Phase 2 of the intervention, all effects sizes were large ($d = 0.8$ or greater), but caution should be taken when interpreting these findings as this group included only 15 participants. Effect sizes for both measures of PTSD symptoms were particularly large across both groups. In the total sample, effect size for self-reported PTSD symptoms, as measured by the PDS, was $d = 2.0$, and for clinician observed symptoms, as measured by the CAPS, was $d = 1.9$, suggesting that the intervention was particularly effective at reducing trauma-related symptoms, consistent with the design and intention of Parenting-STAIR. Figure 2 displays mean change in PTSD and depression symptoms observed among 61 mothers with complete data at all five time points as well as mothers who did not complete Phase 2; these representations suggest that change over time was similar for both groups. Results of *t* tests comparing pre-treatment to 3-month follow-up scores are displayed in Table 3. Effect sizes remained in large range, with a few exceptions (e.g., emotion regulation, child behavior, positive parenting), 3 months following the end of the intervention.

In addition to symptom reduction, at post-test, 39% of mothers experienced PTSD remission, defined as scores less than 20 on CAPS (Weathers et al., 2001). Furthermore, the majority of participants no longer met PTSD criteria at post-test (78%) and at follow-up (77%). Similar results were observed regarding depression outcomes. A significant subset of mothers in this sample (38%) met criteria for comorbid depression at baseline. Of the treatment completers who met depression criteria at baseline (N = 20), 85% no longer met criteria for depression at post-test and 79% no longer met criteria at 3-month follow-up.

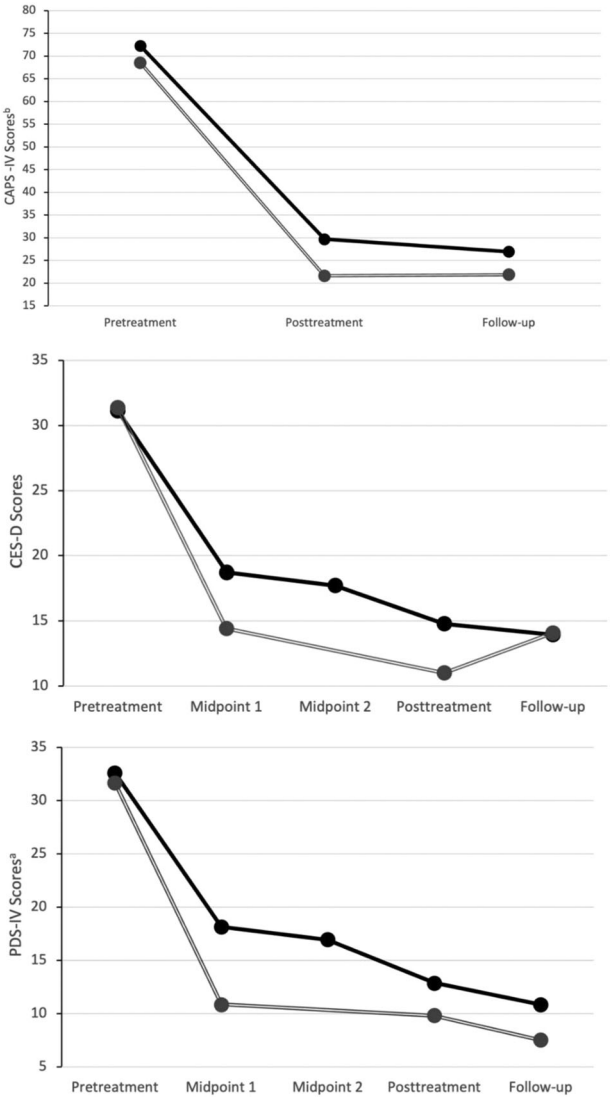

Fig. 2 Reductions in PTSD and depression symptoms among mothers who received Parenting-STAIR. Note: The mean scores on the CAPS-IV, PDS-IV, and CES-D at each assessment time point for all participants (solid line) and those who did not complete phase 2 (double lines). No data from midpoint-2 were collected for mothers who did not complete phase 2

Discussion

The present study aimed to evaluate the feasibility and preliminary impact of a novel intervention, Parenting-STAIR, to improve maternal mental health and parenting skills among trauma-exposed, child welfare-involved mothers and their young children. Results of the present open pilot trial were encouraging. As we hypothesized, findings suggest it is feasible to deliver Parenting-STAIR in the real-world context of child welfare preventive services agencies. Further, results demonstrated that participants receiving Parenting-STAIR experienced large reductions in PTSD and depression symptoms, as well as significant improvements in emotional regulation, reduced negative parenting, and increased positive parenting. Finally, index children who participated in Parenting-STAIR with their mothers also demonstrated significant improvements in behavioral outcomes.

Our experiences in the open pilot offer strong support, particularly considering the context in which this trial was conducted. We successfully built partnerships with four child welfare preventive services agencies in New York City; these agencies provided space within their clinics for Parenting-STAIR clinicians to conduct sessions, committed to screening all incoming clients for possible trauma exposure, and provided referrals to the intervention for mothers who endorsed trauma history. Despite the challenging service context in which these agencies operate, case planners at our partnering agencies screened 818 mothers for trauma and referred 616 mothers to the intervention during the pilot, indicating that ongoing partnership

Table 3 Clinical outcomes (Pre to 3-month Follow-up)

	Baseline				Follow-up				Pre-Follow-up Total Score*							
	Total		No Phase 2		Total		No Phase 2		Total				No Phase 2			
	M (SD)	*n*	M (SD)	*n*	M (SD)	*n*	M (SD)	*n*	t	df	M (SD)	Effect Sizes (d)**	t	df	M (SD)	Effect Sizes (d)**
PDS[a]	32.46(6.58)	56	32.07(5.68)	14	10.82(9.75)	56	7.50(7.37)	14	16.02†	55	21.64(10.11)	2.1	11.64†	13	24.57(7.90)	3.1
CAPS[b]	71.21(15.24)	56	68.64(13.03)	14	26.93(22.86)	56	21.86(21.72)	14	14.23†	55	44.29(23.30)	1.9	8.27†	13	46.79(21.18)	2.2
DERS[c]	66.13(23.49)	56	65.07(18.13)	14	53.52(14.92)	56	52.64(16.53)	14	5.19†	55	12.61(18.17)	0.7	2.89†	13	12.43(16.11)	0.8
CES-D[d]	30.89(9.77)	56	31.86(5.89)	14	13.89(12.21)	56	14.07(12.05)	14	10.00†	55	17.00(12.73)	1.3	5.40†	13	17.79(12.23)	1.4
PSI[e]	94.30(22.37)	56	94.57(23.72)	14	76.43(23.47)	56	69.36(16.94)	14	6.26†	55	17.88(21.38)	0.8	3.46†	13	25.21(27.27)	0.9
ECBI[f]																
Problem	13.05(9.72)	56	12.21(8.77)	14	8.00(9.51)	56	5.07(8.10)	14	4.58†	55	5.05(8.25)	0.6	2.94†	13	7.14(9.08)	0.8
Intensity	117.38(52.17)	56	106.93(40.21)	14	89.02(48.54)	56	67.57(30.40)	14	4.86†	55	28.36(43.67)	0.6	3.95†	13	39.36(37.31)	1.1
DPICS[g]																
Positive	17.33(13.57)	51	13.50(8.01)	12	31.88(20.73)	51	30.83(17.81)	12	4.84†	50	14.55(21.46)	0.7	4.16†	11	17.33(14.43)	1.2
Negative	95.75(38.15)	51	86.08(44.23)	12	56.76(27.78)	51	45.58(24.55)	12	6.68†	50	38.98(41.68)	0.9	2.91†	11	40.50(48.24)	0.8

Note. No phase 2 columns represent the participants who only completed phase 1 and phase 3 of Parenting-STAIR

*Paired Samples Test comparing pre- and 3-month follow-up ratings

**Paired Samples Effect Sizes (Cohen's d) comparing pre- and 3-month follow-up ratings

†t significant at $p < 0.05$

[a]Post-traumatic Diagnostic Scale for the DSM-IV. Possible scores range from 0-51 with higher scores signifying more severe PTSD symptomatology

[b]Clinician Administered PTSD Scale for the DSM-IV. Severity scores range from 0-80 with higher scores indicating higher intensity and frequency of PTSD symptoms

[c]Difficulties in Emotional Regulation Scale. Possible scores range from 36-180 with higher scores suggesting greater difficulty with emotional regulation

[d]Center for Epidemiological Studies-Depression. Possible scores range from 0-60 with higher scores denoting more depressive symptoms. 16 or greater is the cut-off score for identifying risk of MDD

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[g]Dyadic Parent-Child Interaction Coding System. Positive scores include the number of observed praises, reflections, and descriptions used during the play session. Negative scores include the number of observed questions, commands, and criticisms. DPICS are administered for 15-minutes in total with three 5-minute sessions focusing on parent-directed play (PDI), child-directed play (CDI), and clean-up

with family preservation services providers is a reasonable means to deliver this intervention.

Relatedly, data from the pilot suggests that mothers enrolled in our study represent a population who are likely to experience significant barriers to engagement in mental health treatment. On average, participating mothers were highly stressed and extremely low income; the majority were unemployed and many experienced homelessness, all characteristics associated with lower treatment engagement in prior work (Staudt, 2007). Despite these challenges, Parenting-STAIR clinicians were successful in engaging 95% of mothers who met our inclusion/exclusion criteria after the pre-assessment. Further, 63% of mothers successfully completed treatment, a number that is comparable to other trauma interventions (Imel et al. (2013)), despite barriers to engagement in this population. Findings regarding retention in Parenting-STAIR are also convincing considering the pilot study spanned the beginning of the global COVID-19 pandemic, in which very strict lockdowns (particularly in New York City) have been associated with significant treatment disruptions in other studies (Byrne et al., 2021).

Beyond establishing feasibility, a second aim of this open pilot was to explore the preliminary impact of Parenting-STAIR on maternal PTSD and depression, emotional regulation, and parenting skills, as well as on child behavioral health outcomes. As hypothesized, findings indicate significant improvements from baseline to post-test across all outcomes. In particular, very large reductions in PTSD symptoms were noted, both as reported by participants and as assessed by clinicians. The large effects sizes specific to PTSD symptomatology are consistent with the focus of this intervention, which primarily targets disruption in emotional regulation and other symptomatology related to mothers' traumatic experiences. In addition to symptom reduction, most participants in the present study (78%) no longer met PTSD criteria following completion of the intervention, with 39% achieving full PTSD remission. These results compare well to prior PTSD studies where a mean of 67% of participants no longer met PTSD criteria after treatment (Greene, McCarthy, & Estabrook, 2020; Imel et al. (2013)). In a prior randomized controlled trial of STAIR (Cloitre et al., 2010), one of the component interventions that comprises Parenting-STAIR, the STAIR/exposure condition achieved a 24% remission rate with 55% of participants in this condition no longer meeting PTSD criteria. Improvements in PTSD and depression were sustained three months following completion of the intervention.

Additionally, the theoretical model which undergirds this intervention program views mental health symptoms among mothers as a primary mechanism which contributes to adverse parenting outcomes. Specifically, prior research suggests mothers with prior trauma exposure and PTSD and other mental health symptomatology are less likely to use effective parenting skills, are at risk for poor relationships with their children, and are more likely to maltreat their children (Alink et al., 2019; Bödeker et al., 2019; Cooke et al., 2019; Muzik et al., 2017). Findings suggest that participation in Parenting-STAIR not only improved mothers' mental health but also successfully reduced negative parenting behaviors and increased positive parenting behaviors. Relatedly, children who participated in the intervention exhibited corresponding decreases in the frequency and intensity of problematic behaviors. These gains in parenting and child behavior were also sustained three months following the end of the intervention. Future research with the present data needs to consider whether these improvements in parenting successfully prevent maltreatment recidivism among this group of trauma-exposed and child welfare-involved mothers.

Limitations

Findings from this open pilot should be considered alongside several limitations. Most notably, results cannot be evaluated against a comparison condition that did not receive the Parenting-STAIR intervention. Additionally, though larger than the sample size in many pilot studies, the sample in the present study did not support more complicated analyses to evaluate proximal mechanisms which may account for the outcomes observed here. For example, emotional regulation is a mechanism which is hypothesized to account for some or all of the relationship between maternal PTSD symptoms and adverse parenting outcomes; this needs to be evaluated in future studies.

Relatedly, the sample size for analyses conducted on the subgroup of participants who did not complete phase 2 was particularly small, though findings for this group were nevertheless significant. Considering this small sample size, visual representations of the change in outcomes were included in Fig. 2 as an additional means to explore change over time for this subgroup of participants. Considering the relatively small and narrow sample employed here, results may not generalize to the broader child welfare population. Given the length and commitment required of participation in Parenting-STAIR, in the future, we hope to explore strategies to achieve non-inferior outcomes with a shortened version of the intervention.

Another limitation is the scope of gender, as only mothers were included in the present study. We hope to further evaluate the use of Parenting-STAIR with other caregivers, including fathers and non-binary parents in the future. Additionally, the implementation of this study spanned the COVID-19 pandemic, which potentially impacted levels of stress, depression, and anxiety among participants in this study (Racine et al., 2022). It is possible that these effects may have influenced the results presented here, though the present study is unable to quantify the

magnitude of COVID-19's impact. The quality and quantity of other mental health services received concurrently with Parenting-STAIR was not reported on in the study. The impact of additional services on completing treatment needs to be considered in future analysis. While manual adherence was used to inform clinical supervision, data on treatment fidelity was not available for analysis in this paper. Additionally, maltreatment recidivism data was not available for the present study. Future analyses are required to evaluate whether the intervention prevents maltreatment recidivism. Lastly, while our study design and consent process explicitly underline the voluntary nature of participation, we must also acknowledge the reality of human subject research in which participants have limited options – if participants did not consent, for whatever reason, they could not enroll in treatment, and instead were referred to outside mental health services. We would be remiss to not underscore the punitive legacy of child welfare and its potential impact on the voluntary nature of participation in this study.

Conclusion

Many of the limitations identified above will be addressed via a randomized controlled study of Parenting-STAIR, which is currently underway (NCT04752618). The results of the pilot study have been used to justify a larger clinical trial that commenced in May 2021. This project compares Parenting-STAIR to an active control condition and will offer a larger sample size to evaluate proximal mechanisms that may connect maternal trauma and child maltreatment outcomes. Collectively, these projects underscore the importance of addressing maternal mental health alongside child well-being and parenting skills to further preserve child welfare at systemic and interpersonal levels.

Author Contributions The study was designed by M.A.L., in collaboration with M.C., A.U., S.T., and C.C. (deceased author). The statistical design was developed by K.S.S in consultation with M.A.L. K.S.S., K.A., and W.W. drafted the manuscript. Analysis was conducted by K.A. and W.W. M.O. and D.K. assisted in treatment protocol production and data collection. All authors provide substantive comments on several versions of the manuscript. All authors read and approved the final manuscript.

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Compliance with Ethical Standards

Conflict of Interest The authors declare no competing interests.

Ethical Approval The study (IRB-FY2016-1058) was approved by the Institutional Review Board for New York University on 8/23/2016. Annual approval was received; most recently, the study was renewed on 3/16/2022.

Informed Consent Informed consent was obtained from all individual participants included in the study. Legal guardians provided informed consent for child participants; index children gave assent prior to their participation.

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