

Effects of the Mother-Child Education Program on Parenting Stress and Disciplinary Practices Among Refugee and Other Marginalized Communities in Lebanon: A Pilot Randomized Controlled Trial

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Abstract

Background: Few randomized controlled trials (RCTs) have explored the implementation and impacts of early childhood parenting education programs in very fragile contexts and humanitarian settings. We tested the effects of a group-based intervention, the Mother-Child Education Program (MOCEP), on parenting stress and practices among two refugee and one marginalized community in Beirut, Lebanon.

Method: A pilot wait-list RCT was conducted to assess the impact on maternal, child (2 to 7 years of age), and dyadic outcomes. 53 mother-child dyads were randomly assigned to the intervention group and 53 mother-child dyads to the wait-list control group. Analysis was conducted by modified intention-to-treat and supplemental analyses through multiple imputation of missing post-intervention data. The trial is registered at ClinicalTrials.gov, number NCT02402556.

Findings: After completing the program, mothers in the intervention group showed an improvement in their disciplinary style as indexed by the Disciplinary Style Questionnaire (Cohen's $d = -0.76$, 95%-CI = -1.24, -0.27, $p = 0.0276$) and in their level of parenting stress, as indexed by the Parenting Stress Index (PSI) (Cohen's $d = -0.90$, 95%-CI = -1.39, -0.40, $p = 0.0009$). Analyses of dyadic interactions revealed reductions in the PSI were associated with higher levels of positive parenting after the intervention. We did not detect any impact on behavioral and emotional problems, which was the primary outcome of interest for children.

Interpretation: Our analyses suggest that MOCEP had a positive impact on disciplinary practices and parenting stress in a context of high fragility, but that broader effects on maternal and child outcomes may be dependent on program attendance. We discuss implications of this pilot study for practice and research of a largely unexplored area of program evaluation.

Keywords: Parenting programs; early childhood development; parental stress, parental practices, disciplinary style, fragile contexts

Introduction

Approximately 28 million children worldwide have been victims of forced displacement and 230 million reside in countries torn by armed conflict.¹ Furthermore, a recent study estimated that nearly 385 million children live in extreme poverty.² Poverty, war and displacement can drive instability within the family that compromises parental wellbeing and positive parenting practices with detrimental effects on the developmental trajectory of young children.^{3,4} Since many of these effects can be reversed or attenuated via social interventions, robust evidence on the impact of programs that target responsive caregiving and that foster holistic development during the early years is urgently needed.⁵ In particular, parenting programs that target skills and wellbeing of caregivers have proven to be important social interventions because of the critical role that parents play in driving development and mitigating exposure to risk or harm.^{6,7} Three areas of impact for parenting programs have emerged from the literature and have been proposed as an integrative model for parenting in contexts with a high stress burden: parenting stress and psychological wellbeing, positive disciplinary practices, and parenting knowledge and skills.^{4,8} The components of this integrative model are inter-related. For instance, parenting stress may contribute to less positive parenting skills, which is a key risk factor for child maltreatment.^{9,10}

Despite increasing attention to the impact of parenting programs, few robust evaluations have explored their effectiveness in low-income and humanitarian settings.⁴ Robust evaluations of programs which address the holistic developmental of children after the first 1,000 days, that target positive parenting skills and practices, and that are implemented in highly vulnerable settings are notably scant, though a few examples have been published.¹⁰ In Ethiopia, a randomized controlled trial (RCT) of a program that combined home visits and group-based activities led to positive impacts on quality of parent-child interactions.¹¹ An RCT of an integrated parenting program targeting disadvantaged communities in South Africa, also showed improvements in markers of positive parent-child interactions.¹² In Iran, a parenting intervention delivered via existing health services, was also evaluated via an RCT and demonstrated impacts on self-reported negative/harsh parenting practices.¹³ While limited data suggest parenting programs hold potential for reducing risk for harsh parenting in low-income contexts, the effectiveness of parenting programs in settings where poverty, insecurity and displacement co-occur remains very poorly understood.^{14,15,16,17} There is a need to strengthen the evidence base of parenting programs that aim to promote early childhood development (ECD) in low and middle-income countries (LMICs) to inform effective program and policy options.¹⁸

To address this gap in the evidence base, we evaluated the impact of the Mother-Child Education Program (MOCEP) among three vulnerable populations in Beirut, Lebanon. MOCEP, the flagship program of the Mother-Child Education Foundation (AÇEV) in Turkey, has been implemented in 11 countries to date.^{19,20} MOCEP is a 25-session group-based program, which also includes home visits by trainers, and targets multiple domains of parental knowledge, attitudes and skills and aims to provide mothers with techniques to foster school readiness.^{19,20} In Turkey, the program has been shown to improve disciplinary practices and parenting knowledge and to promote maternal empowerment.²¹

A longitudinal study revealed that children who either attended an early childhood program or whose mothers participated in MOCEP achieved higher rates of university attainment, higher status job acquisition, and higher socioeconomic status in adulthood, compared with peers not enrolled in an early childhood program or involved in MOCEP.²⁰ To date, no randomized controlled evaluations of MOCEP have been conducted, nor have the impacts of the program been explored when implemented in humanitarian contexts.

Lebanon is home to a rapidly growing refugee community. According to the most recent United Nations High Commissioner for Refugees statistics, Lebanon hosts over 995,000 registered refugees, placing considerable strain on the systems and infrastructure that support social, economic and humanitarian needs.²² In light of the evidence demonstrating that parenting practices can be determinants of child development in contexts of poverty, conflict, and displacement, our main aim was to explore the impact of MOCEP on maternal knowledge, parenting practices and disciplinary style in three marginalized communities in Lebanon – including two refugee communities. We also aimed to examine whether the program had an impact on parenting stress and other outcomes hypothesized to contribute to parenting functions, including perceived social support and maternal empowerment. Impacts of the program on children’s socioemotional, executive function and cognitive development were also explored. The study also assessed changes to mother-child dyadic interactions upon program participation.

Methods/Design

Study design and participants

We conducted this wait-list RCT in three communities in southern Beirut, Lebanon. The target sites were selected based on the ongoing partnerships of the local implementing agency (The Arab Resource Collective, or ARC) with local NGOs, and on recommendations of the Ministry of Social Affairs in Lebanon (MoSA) and the United Nations Relief and Works Agency for Palestine Refugees in the Near East (UNWRA). Site 1 (Burj al Barajneh) and site 2 (Chatilla) are two of the largest refugee communities that have historically been home to Palestinian refugees. Recently, Chatilla has also become home to a large population of refugees from Syria (some ethnically Palestinian, but many not). At these two sites, recruitment of mothers was facilitated by directors of community and/or social service centers (identified as community leaders) under the supervision of the MOCEP implementation coordinator. Although we originally intended to enroll a third site that housed Palestinian communities, we were unable to secure the partnership with the relevant NGOs. Upon consultation with MoSA, we partnered with a center in Chiyah located in a low-income Lebanese neighborhood in Beirut. The majority of the population in Chiyah is Lebanese, though it is also home to a number of displaced Syrian families. Each site implemented one MOCEP group. To be enrolled in the study, the mother had to be able to read and write in Arabic, have a child between two and seven years of age, agree to try to participate in the entirety of the program, agree to (herself and her child) complete the assessments, and live within the catchment area (or

live in close proximity) of the NGOs where the program was implemented. Also, whenever possible, ARC staff provided childcare during the sessions.

Recruitment and consenting procedures

We provided invitation letters to mothers seeking primary health care or social support from local NGO centers, foundations, and MoSA in the target areas to participate in the MOCEP intervention and evaluation study. Additional recruitment occurred in organized community gatherings and town hall meetings. ARC obtained lists of mothers who agreed to be contacted via telephone, where additional screening occurred. Interested mothers who were eligible to participate were invited to an introductory group meeting where they were scheduled for their initial assessment (baseline), at which time written consent was obtained. Mothers provided permission for their children to participate in the program and study. The Principal Investigator in Lebanon (GI) obtained written consent from NGO directors to ensure proper understanding of the study purpose, procedures, rights and privileges of all participants. The NGO Director Permission/Consent Form was incorporated into a Memorandum of Understanding (MoU) between ARC and the NGO. Each participating family was offered \$10 for each data collection time point. This trial was conducted according to the protocol approved by Human Subjects Committees at Yale University and the Arts, Sciences, and Technology University in Lebanon (AUL), who approved all recruitment, assessment, data management, and participant protection procedures. No adverse effects were reported during the course of the study.

Randomization and masking

Dyads were randomly assigned to either the intervention or the wait-list control group. Randomization was performed by a study biostatistician (LK) not involved in data collection using randomly permuted blocks (block size = 4) stratified by recruitment site. Due to the small, close-knit nature of the communities in which participants resided, blinding of dyads and their families was not possible. However, blinding was used for all study personnel involved in data collection and video coding. For ethical reasons, all subjects were allowed to participate in the intervention, either in the first wave (intervention group) or the second wave (wait-list control group). This second wave of intervention was implemented after all study outcome assessments had been performed. In order to maintain the wait-list control group's engagement, periodic social activities (such as outings to recreational areas) were offered once every two months, on average.

Procedures

MOCEP was implemented over 25 sessions through group meetings that each lasted approximately three hours. Sessions were designed to be implemented once a week. However, in two of the three sites and upon request of the mothers, some sessions were implemented twice a week. The core curriculum for MOCEP included the following themes: child development (physical, cognitive, social); the importance of play in development; parenting practices (discipline, conflict resolution); health and hygiene (nutrition, healthcare); and maternal empowerment (income generation, rights, family

planning). The program combined lectures, practical demonstrations, and assignments to be completed in the home. Group meetings began with a discussion of the weekly topic, led by a group trainer, known as the Mother Support Program (MSP) sub-component of MOCEP. During the remaining time in the session, mothers gathered around tables in groups of 4 or 5 and, with the help of a mother aide chosen from the group, learned skills from the Cognitive Training Program (CTP). The CTP aimed to provide mothers with techniques to support several child developmental domains. Mothers were asked to work with their children through the CTP forms provided during the sessions. Group leaders also conducted home visits (2 per household) to provide advice and support to the participating mothers in the application of the program's content. All three MOCEP trainers who delivered the intervention held Doctorates in ECD. The trainer of trainers, who also performed external observations to ensure fidelity of implementation, had a Bachelor's degree in ECD and a Master's in Social Work. The trainers went through regular training organized by ARC lasting ten days and covering the facilitation skills needed to work with parents and the content of the parenting topics delivered in MOCEP. The program was translated into Arabic and culturally adapted for the local context by ARC, with the support of AÇEV. Program dose was measured by mothers' attendance to training sessions and recorded by trainers in attendance sheets. Fidelity of the implementation of the program was monitored via observation of 10% of the sessions by ARC's master trainer.

Two members of the Yale University research team travelled to Beirut and trained the data collectors, who were fluent in English, for five days. The training combined an in-depth discussion of the entire battery and principles of data collection and management. The child assessment was complemented with videos produced to illustrate the procedures. A field test was conducted prior to the initiation of the RCT to optimize enrollment strategies and study battery and instruments, as well as to time the assessments for recruitment purposes. Weekly calls between the Lebanese and international partners took place during the course of the study to ensure fidelity of the assessments, data management and study procedures. The data collection team consisted of one assessor who conducted the mothers' interviews and a second assessor who conducted the direct child assessments. Both assessors collected the data across the 3 sites. Scale reliabilities were estimated using Cronbach's Alpha.

The program was implemented and assessed in tandem. Data collection lasted approximately 1 month per wave in each site. MOCEPs' implementation lasted from 6 to 8 months, depending on the site. Implementation took place between April-October 2015 in site 1, June 2015 – January 2016 in site 2, and October 2015 – April 2016 in site 3. The trial is registered at ClinicalTrials.gov (NCT02402556).

Demographic and contextual variables

At baseline, participants completed a demographic characterization and home environment questionnaire. Questions included maternal age, medical history, marital status, migration history, parental education and profession, access to goods and services, number of children living in the home, type of housing, and family participation in

community events. The demographic questionnaire also assessed if, at baseline, children were enrolled in any type of early childhood education program, as well as if children had been diagnosed with any physical (including hearing or vision) and/or cognitive disability or delay.

Basic needs. A score indicating the extent to which basic needs were met was computed utilizing three variables: (1) a household crowding index (HCI); (2) a scale measuring human insecurity; and (3) a scale assessing food insecurity. The HCI was defined as the number of people living in the home divided by the number of rooms in the home, including the kitchen and the bathroom. Human insecurity was operationalized as maternal perceptions of personal and family safety and was assessed using the Human Insecurity Scale Variables (HISV). The HISV is a brief 10-item scale developed to capture individual perception of security among communities in the Gaza Strip.²³ Food insecurity was assessed with the 8-item Arab Family Food Security Scale (AFFS) plus one supplemental question from the evaluation of the Healthy Kitchens, Healthy Children (HKHC), a nutrition project currently underway in Beirut, Lebanon.^{24,25} The food insecurity questionnaire was developed specifically for Arab communities in the Middle East and measures degrees of family-level food insecurity in the previous year. Scores on the AFFS showed small correlations with the HISV ($r = 0.25, p < 0.05$) and the HCI ($r = 0.29, p < 0.01$). There was a small correlation between the HISV and the HCI ($r = 0.27, p < 0.05$). A principal factor analysis using the three basic needs variables showed that a total of 27.57% of variance was explained by a single factor. The factor score was saved for further analysis using a least squares regression approach. Higher factor scores indicate that the family's basic needs were being met to a lesser degree.

Primary maternal outcomes

Disciplinary Style Questionnaire (DSQ). Disciplinary style was assessed using the DSQ, which has been validated across nine countries, including Jordan.²⁶ The DSQ is comprised of 7 subscales: inductive discipline, manipulating privileges, physical punishment, harsh verbal discipline, argument, shaming, and ignoring. To assess the impact of the program on markers of harsh parenting, we computed a composite (i.e., sum) of the arguing, shaming, ignoring, harsh verbal discipline and physical punishment subscales (Cronbach's $\alpha = 0.76$).

Better Parenting Program (BPP) questionnaire. Maternal knowledge and practices were assessed using the BPP questionnaire, an instrument developed to evaluate a comprehensive parenting program for mothers, fathers and other family caregivers in Jordan targeting parental knowledge, attitudes and practices with regard to learning and holistic child development²⁷. Since only one study had previously used this instrument in the context of program evaluation, we grouped the items together into 3 main possible subscales, based on the content of the items. Our conceptual analysis yielded 3 possible subscales. Limit setting (Cronbach's $\alpha = 0.63$) and responsive parenting (Cronbach's $\alpha = 0.66$) were conceptually well aligned with MOCEP's theory of change. The third subscale, parental knowledge about ECD, had an unacceptable reliability (Cronbach's α

= -0.03) and the items aligned to a different programmatic content; therefore, we omitted it from the analyses.

Primary child outcomes

Strengths and Difficulties Questionnaire (SDQ). The primary outcome of interest for children was parental report of the child's social-emotional development, measured using the SDQ.²⁸ The SDQ is a parent-report measure of 2-to-17-year-old children's behavioral and emotional problems, conduct problems, hyperactivity, and peer relations. The Arabic version has been administered to parents of Lebanese children between 6 and 12 years of age.²⁹ At baseline, internal consistencies of the SDQ subscales were low to moderate for emotional symptoms (Cronbach's $\alpha = .40$), conduct problems (Cronbach's $\alpha = .45$), and hyperactivity/inattention (Cronbach's $\alpha = .46$) and prosocial behavior (Cronbach's $\alpha = .45$). The peer problems subscale showed unacceptable internal consistency (Cronbach's $\alpha = -.07$). The externalizing score (composite of the conduct and hyperactivity scales) reached an acceptable internal consistency of Cronbach's $\alpha = .61$, whereas the internalizing score (composite of emotional and peer problems) yielded low reliability (Cronbach's $\alpha = .38$), as did the total difficulties composite (Cronbach's $\alpha = .41$). We conducted the analyses using the total difficulties composite (emotional symptoms, conduct problems, hyperactivity, and peer problems, 20 items) and the prosocial behavior subscale (5 items).

Secondary and exploratory maternal outcomes

Parenting Stress Index-Short Form (PSI-SF). A modified version of the 36-item short form of the Parenting Stress Index (PSI-SF) was used to assess mothers' level of parenting stress.³⁰ The PSI-SF has three subscales, which measure parental distress, the parent's perception that the child falls short of their expectations, and the degree to which the child is responsive to parental directions. Each subscale is comprised of 12 items. The "not sure" option was inadvertently deleted from the Arabic version of the PSI-SF, so that the instrument had just a four-point scale ranging from 1 (*strongly agree*) to 4 (*strongly disagree*). Items were reverse-coded and scores were summed to compute a total composite score of parenting stress (Cronbach's $\alpha = 0.85$), with higher scores indicating more perceived parenting stress.

The Duke Social Support Index-Short Form (DSSI-SF). The DSSI-SF was used to assess perceptions of social interaction and subjective support.³¹ We used the abbreviated 11-item version of the DSSI, which was applied in the HKHC project.²⁴ A total score of social support was computed by summing scores on the 11 items (Cronbach's $\alpha = 0.72$).

Individual Distress Scale (IDS). Mothers reported perceptions of individual distress (referred to herein as the IDS) using a 12-item rating scale used in previous studies involving communities in the Gaza strip.²³ Mothers were asked to report the extent to which they are currently feeling a number of affects (e.g., frustrated, lonely,

anxious). A total score of individual distress was computed by averaging all items (Cronbach's $\alpha = 0.85$).

WHO-Five Well-being Index (WHO-5). Mothers rated their quality of life based on positive mood, vitality and general interest in things using the five-item WHO-5.³² A total score was computed by summing all items (Cronbach's $\alpha = 0.84$).

Father Involvement Questionnaire (FIQ). The FIQ was developed specifically for the impact evaluation of MOCEP by the authors of this study. The questionnaire has 20 items that assess the mother's perception of her husband's involvement in interactions with the mother (Cronbach's $\alpha = 0.82$), his child(ren) (Cronbach's $\alpha = 0.74$), and people in the community (Cronbach's $\alpha = 0.74$).

Women's Empowerment Questionnaire (WEQ). Maternal empowerment was measured using the WEQ, which includes 8 questions about the extent (not at all, a small extent, a medium extent, or a high extent) to which mothers perceive they can make decisions regarding aspects of household life involving financial, social, family planning, and health-related factors (Cronbach's $\alpha = 0.68$). The WEQ was applied in the HKHC Project.²⁴

Secondary and exploratory child outcomes

Bear/Dragon Task. We applied a modified version of Bear/Dragon task to measure inhibitory self-control.³³ The Bear/Dragon task involves the child following the commands of the "nice" bear and not following the commands of the "naughty" dragon. After the child was able to perform correctly in the teaching trial, 12 actual trials were delivered, with alternating bear and dragon commands. Performance on actual trials was coded as correct (i.e., 1 = commanded movement) or incorrect (i.e., 0 = wrong movement). Trials were added to create a composite score (Cronbach's $\alpha = 0.81$).

Shape Stroop. A modified version of Shape Stroop was applied to assess effortful control.³⁴ After the child was able to perform correctly in the teaching trial, the child was asked to identify the small fruit embedded in a picture of a larger fruit (e.g., a small apple embedded in a large orange or a small orange embedded in a large banana). Performance was coded for three actual trials of the task as 1 (i.e., successfully completed the task) and 0 (i.e., did not successfully complete the task). Trials were added to create a composite score that yielded low internal reliability (Cronbach's $\alpha = 0.36$).

Arabic Language Evaluation of Function (ALEF). Language development was measured using children's performance scores on the ALEF a clinical tool that provides a comprehensive measure of spoken and written Arabic in children from ages 3.5 to 10 years.³⁵ We applied the subscales of pragmatic knowledge (assess the child's familiarity with conventional language according to different social situations) (Cronbach's $\alpha = 0.79$), receptive vocabulary (knowledge and use of descriptive words/terms) (Cronbach's

$\alpha = 0.62$), and sentence completion (comprehension and ability to match verbal statements to pictorial descriptions) (Cronbach's $\alpha = 0.71$).

Bracken School Readiness Assessment (BSRA). Translated versions of the letter and number recognition subtests of the BSRA were applied to assess emergent literacy and numeracy skills, respectively.³⁶ The BSRA is multi-part assessment and an individual cognition test designed from children in pre-K through 2nd grade. The BSRA has been partially validated as a screening measure predictive of teachers' ratings of school readiness in the United States.³⁷ Partners at ARC adapted the letter identification items. The adaptation process was done while keeping in mind the carefully selected distractors that are typically based on the visual similarities between letters or phonological similarities between phonemes they represent.³⁸ The letter (Cronbach's $\alpha = 0.9$) and number recognition (Cronbach's $\alpha = 0.91$) subtests yielded good reliability.

Peace Promotion Skills Scale (PPSS). The PPSS includes 5 items specifically designed by the research group for the evaluation. The items draw from behavioral domains explored in a peace promotion curriculum delivered, in a different context, among preschool children.³⁹ The instrument is a maternal report on markers of her child's prosocial behavior, such as how true it is of the child that he/she avoids conflict, resolves conflict by talking, is able to calm down, and is able to share/take turns (Cronbach's $\alpha = 0.56$).

Mother-Child Interactions. Dyadic interactions between mothers and children were conducted prior to and following the intervention. Mothers and children were provided a wooden puzzle and were asked to play together for 10 minutes. We chose this task because one of the main objectives of MOCEP is to provide mothers to teach children different skills, and we deemed the task appropriate to assess this as well as other key markers of interactive behaviors. Mothers were coded in terms of maternal positive regard, maternal intrusiveness, maternal disengagement and maternal sensitivity during the interactions.⁴⁰ Children were coded in terms of positive affect, negative affect, and non-compliance during the task.⁴¹ Parent-child synchrony was operationally defined as dyadically regulated affective exchanges and connectedness.⁴² The coders were blinded to the group assignment. All videos were double coded (by Yale Researchers), and 25% of the videos were coded a third time by the lead trainer (JB) to ensure consistency in coders' ratings. Inter-rater reliability, correlations between coders, ranged from $r = 0.85$ to 0.92 .

Power and statistical analysis

G*Power 3.1 was used to conduct an a priori power analysis for a repeated-measures ANOVA (F-test of the within-between group interaction). Results showed that total sample sizes of 402, 70, and 30 were required to detect significant small (Cohen's $f = 0.1$), medium (Cohen's $f = 0.25$), and large (Cohen's $f = 0.4$) effects, respectively, accounting for multiple hypothesis testing using Bonferroni correction (i.e., alpha error probability = 0.0017). Given the difficult circumstances of the context and observations

in the extant literature of relevant behavioral parenting training programs, we predicted a medium effect of the intervention. We were also aware of the possible challenges to recruitment and continued program participation, and therefore chose a conservative recruitment target. Baseline differences between the MOCEP intervention and control groups, as well as differences between the three sites, were assessed using *t*-tests or analyses of variance (ANOVAs) for continuous variables and chi-square tests for categorical variables. We employed modified intention-to-treat (ITT) approach and used mixed model repeated measures analysis to examine the effectiveness of the MOCEP program based on mothers' and children's primary and secondary outcomes. Some mothers were excluded from the analysis as noted in the consort diagram (see Figure 1 for justification of exclusion after randomization). All models included fixed effects for treatment (two levels), time (baseline and endpoint), site, and time-by-treatment interaction. In addition, basic needs, mother's age and mother's years of education were included as covariates in models on mothers' outcomes. Covariates for the child outcome models included basic needs, child's age and sex, as well as child's participation in any early childhood education program or preschool, and presence of a diagnosed or maternal-reported physical or cognitive disability or delay. Cohen's *d* effect sizes (the difference between the change scores of each group divided by the pooled standard deviations at baseline) were calculated for all outcomes. Significance level was set at 0.05. Given the comprehensive set of outcome variables as well as the considerable amount of missing endpoint data, 50 datasets were generated for the maternal, child, and dyadic outcome measures in three separate analyses by applying multiple imputation. As common in ITT analyses of an RCT, we performed a series of independent sample *t*-tests on the post-intervention variables using the multiple imputation datasets (see supplemental materials). Analyses for the imputed data were conducted in R (version 3.5.2).

As a supplemental analysis, a latent change score model (LCSM) was formulated to examine inter-individual differences in intra-individual change in parenting stress from baseline to endpoint assessments, and whether the change in parenting stress is related to the dyadic interaction outcome measures after the intervention.⁴³ Measurement invariance was modeled such that both time points were constraint to the same measurement structure and time-invariant loadings for each indicator to facilitate inferences from the variance-covariance structure. The overall goodness-of-fit of the model was evaluated based on established test criteria and cut-off-values of fit indices.⁴⁴ Supplemental Table 2 shows that the model with constraints on equal factor loadings of the same parenting stress indicator over time fit the data well. This model was used as the measurement model for the analysis of associations between the change in parenting stress and dyadic outcomes.

Results

147 mother-child dyads from two refugee communities and one peri-urban community in Beirut, Lebanon, were screened for eligibility (Figure 1). Out of those who met the study eligibility criteria and completed the baseline assessment, 53 were randomly assigned to

the intervention and 53 assigned to the wait-list control group. Two children were 7 years old at baseline and three children were 2.1 years old at the time of enrolment and did not turn 3 during the intervention. From the intervention group, 21 dyads (40%) discontinued early, and from the control group, 19 dyads (36%) discontinued early, for an average attrition rate of 38%. However, out of 21 mothers who withdrew early in the intervention group, six returned to complete the endpoint assessment. One participant in the control group attended intervention sessions and was among 19 who discontinued early; she was excluded from the pre-post analysis (Figure 1). One mother returned for the endpoint assessment. Therefore, data from 35 mothers from the intervention group and 34 mothers from the control group were analyzed at endpoint. There was no significant difference in the attrition rates of the intervention and control groups ($p = 0.69$). Reasons for early withdrawal (of the total sample), included new employment (6%), program burden (5%), change in life circumstances (4%), illness of family member (4%), travel (4%), illness of the participant (1%), or no reason reported (2%). The average attendance rate across the three sites was 14.5 ($SD = 9.2$) sessions, out of 25 possible program sessions. Illness and travel were commonly reported reasons for non-attendance. There were no statistically significant differences among the three sites in terms of the average attendance rates ($p = .09$). We established baseline demographic similarity between the intervention and control groups and compared baseline scores of primary, secondary and exploratory outcomes of interest (Table 1). Most mothers were married, had completed elementary school, were unemployed, and were born in Lebanon. Of the 33 mothers who reported being born in another country, 1 was born in Libya, 1 in Abu Dhabi, 1 in Jordan, 1 in Saudi Arabia, and 29 in Syria. Of note, the majority of children were reportedly attending an early childhood development or education program at baseline. With regard to the outcomes of interest, there was a statistically significant difference of the BPP-Limit setting score ($p = .008$) at baseline with mothers in the intervention group reporting higher levels. Scores for child executive function (Bear/Dragon total score) ($p = .008$) and the ALEF Sentence Completion score ($p = .03$) were higher at baseline for the control group. There were no differences at baseline for maternal outcomes or markers of dyadic interaction between the intervention and control groups.

Maternal outcome measure scores at baseline and endpoint for the intervention and control groups are shown in Table 2. After completing the program, mothers in the intervention group showed reduction in harsh disciplinary practices, as indexed by the DSQ ($n = 35$, mean = 46.43, $SD = 11.69$) compared with the control group ($n = 34$, mean = 54.71, $SD = 12.80$). The intervention effect size was -0.76, 95% CI = -1.24, -0.27, $p = .028$. Mothers in the intervention group also showed reduction in their parenting stress, as indexed by the PSI ($n = 35$, mean = 98.97, $SD = 12.73$) compared with the control group ($n = 34$, mean = 112.2, $SD = 16.49$). The intervention effect size was -0.90, 95% CI = -1.39, -0.40, $p = .0009$.

Child outcome measure scores at baseline and endpoint for the intervention and control groups are shown in Table 3. After completing the program, there were no effects on children's behavioral and emotional difficulties, as indexed by the SDQ. Out of the secondary child measures explored, the intervention group displayed a significant improvement in the ALEF Pragmatic Knowledge score as compared to the control group

(effect size = 0.53, 95% CI = 0.03, 1.03, $p = .036$) (Table 2). There were no significant differences in the dyadic interaction measures explored (see Supplemental Table 1). The results of the multiple imputation (MI) analyses on the maternal, child and dyadic outcome measures are reported in Supplemental Tables 3, 4, and 5, respectively. The pattern of findings closely resembles the pre-post differences between mother-child dyads in the intervention and control conditions that were identified in the mixed model ANCOVAs. Findings from the MI analyses are presented as complementary analyses based on recent guidelines for ways to deal with missing data in RCTs.^{45,46}

Next, we estimated the LCSM ($n = 105$) that fit the data reasonably well given the actual sample size, $\chi^2 (df = 24) = 24.34, p = .44$; RMSEA = .012, 90%-CI = [.000 - .080]; CFI = .998; SRMR = .059. Results (see Supplemental Table 2 and Supplemental Figure 1) showed that an increase in parenting stress from baseline to endpoint was significantly associated with lower levels of positive parenting markers (i.e., the mean of maternal sensitivity, synchrony, and positive regard; $\beta = -.32$) and higher levels of maternal intrusiveness ($\beta = .43$) during the mother-child interactions. Mothers in the intervention group showed significant reductions in parenting stress from baseline to endpoint compared to mothers in the wait-list control group ($\beta = -.47$). The indirect effects of group on positive parenting ($\beta = .15, p = .03, 95\%-CI = 0.02, 0.28$) and intrusiveness ($\beta = -.20, p = .01, 95\%-CI = -0.36, -0.04$) were statistically significant, indicating that changes in parenting stress may mediate the effects of the intervention on observed dyadic interaction outcomes.

We also analyzed the changes in all maternal and child outcome scores of mothers attending at least 50% (≥ 14) of the sessions, or high-attendance mothers (Table 4). Comparing the demographic characteristics of the high-attendance mothers to the low-attendance mothers, there were no statistically significant differences between any of the covariates (data not shown). Here, we highlight significant differences across the outcomes at a $p < 0.05$ threshold. For high-attendance mothers, the analyses show improvements in disciplinary style (baseline mean = 49.2, $SD = 10.44$ vs. endpoint mean = 45.1, $SD = 9.99$) and responsive parenting (baseline mean = 36.9, $SD = 3.91$ vs. endpoint mean = 38.9, $SD = 2.6$). High-attendance mothers also displayed reduction in parenting stress (baseline mean = 108.8, $SD = 12.68$ vs. endpoint mean = 97.8, $SD = 12.01$) and reported higher levels of perceived social support, as indexed by the DSSI (baseline mean = 23.3, $SD = 3.73$ vs. endpoint mean = 26.5, $SD = 2.64$). Mothers from the high-attendance group also reported increased markers of female empowerment (baseline mean = 17.8, $SD = 4.79$ vs. endpoint mean = 20.3, $SD = 2.47$) and a decrease in individual distress (baseline mean = 2.46, $SD = 0.66$ vs. endpoint mean = 2.12, $SD = 0.51$). Improvement in the pragmatic knowledge scores of children of the high-attendance group was also significant (baseline mean = 8.4, $SD = 4.44$ vs. endpoint mean = 10.0, $SD = 3.86$). No changes were detected in dyadic interaction measures in the high-attendance group.

Discussion

This study sought to assess the impact of MOCEP, a 25-session parental education and

support program, on maternal, child and dyadic outcomes among families living in marginalized communities in Beirut, Lebanon - including two designated refugee communities. Specifically, we aimed to determine the impact of the program on maternal disciplinary style as well as knowledge and attitudes regarding child development. Our findings demonstrated that mothers who participated in the program reported less harsh disciplinary practices on the DSQ, an instrument widely used to measure harsh disciplinary practices and validated across nine countries, including Jordan.²⁶ To our knowledge, this is one of the first studies to use a DSQ composite to assess the impact of an intervention on the reduction of harsh disciplinary practices. This highlights the need for more research to inform valid measures of parental practices in fragile contexts. We also found that participation in MOCEP decreased parenting stress (measured by the PSI), a secondary maternal outcome of interest. One study that has used the PSI as the primary outcome measure of the effects of a behavioral parent training with 12 weekly sessions has yielded differences between the intervention and control group of medium effect sizes (i.e., Cohen's d 0.59 to 0.62 for the parent and child subscales, respectively).⁴⁷ Another study used the PSI short form to examine the effectiveness of the Incredible Years parenting program and found a significant reduction in parenting stress in the intervention group with a medium-to-large effect size (Cohen's $d = 0.72$).⁴⁸ Although the effect size identified in our study (0.76, favoring the intervention group) is comparable to these, more research is needed to establish the clinical relevance of these findings in comparable contexts, particularly due to the non-clinical sample in this study. When assessing the impact among mothers who attended 14 or more sessions, we also observed significant and positive effects on other outcomes including self-reported responsive parenting, perceived social support, individual distress, and women's empowerment.

Importantly, our results show that group-based intervention coupled with didactic modeling by skilled program trainers can have positive impacts on markers of maternal psychosocial wellbeing in fragile contexts. These findings are consistent with existing literature. A recent meta-analysis of group-based parenting interventions found that intervention groups display decreased rates of depression, anger, and guilt in the short-term.⁴⁹ All 48 studies included in the review above were performed in upper-middle to high-income countries, and our study is among the first to examine the impacts of such programs on parental wellbeing and mental health in vulnerable contexts or displaced populations.

Our study also demonstrates the feasibility of decreasing harsh disciplinary practices through participation in a targeted intervention. An earlier systematic review of the literature showed that home-visiting programs decreased child maltreatment, and meta-analyses have shown that different parenting program modalities also reduce harsh and dysfunctional parenting practices.^{50,51} Notably, most of the literature on the impact of parenting interventions on markers of positive discipline have also emerged primarily from high-income countries.⁵² Some studies have shown impacts of parenting programs on abusive parenting and child maltreatment in LMICs.⁵³ However, according to a systematic review, most evaluations of programs in LMICs have focused on the quality of interactions, nutrition or cognitive factors.¹⁰ Our study addresses maternal wellbeing

and practices from a broader perspective. Despite these promising results, the small sample size, the high drop-out rate, the lack of long-term follow-up, and lack of psychometric information on some of the measures in this cultural context, render these results preliminary in nature. Additional research is needed to confirm the results of this pilot study in similar settings.

Although an assessment of the cultural determinants of parental practices was beyond the scope of this study, we fully acknowledge that culture, parental cognitions, and parenting practices are interrelated.^{6,54} Our study aimed to primarily assess the impact of MOCEP on parental practice in a highly vulnerable context. The tool used to assess disciplinary style (DSQ) was validated across thirteen cultural groups, including Jordan, which concluded that maternal reports of self-discipline can represent the same construct cross-culturally.²⁶ However, a key area of research that remains largely unexplored involves how cultural conceptions of parenting are altered during conflict, insecurity, and other contextual risks.

This study also sought to assess the impact of MOCEP on child outcomes. We hypothesized that improvements in maternal practices and wellbeing, as well as the application of the cognitive enrichment program elements, would have a positive impact on child developmental outcomes, as well as on indicators linked with school readiness. In Turkey, evaluations of MOCEP demonstrated that the program was associated with higher cognitive outcomes in primary school children.¹⁹ There is a notable lack of validated Arabic measures shown to be sensitive to measuring programmatic impact among young children. The SDQ, which was used to measure the primary outcome of interest (socioemotional development) in children, showed very low reliability. Cronbach's α , which was estimated, provides a lower-bound estimate of scale reliability and may hint at a multifactorial structure of the subscales that has been proposed in previous studies using the Arabic version of the SDQ.⁵⁵ Another circumstance that may affect the reliability estimates is the low frequency of certain problem behaviors (e.g., steals from home, school or elsewhere) as rated by the parents.

We utilized a newly developed measure (*ALEF*) to explore impacts on language development.³⁵ Our analyses showed that only the domain of pragmatic knowledge was significantly impacted by the intervention. MOCEP encourages maternal-child interactions by promoting joint activities, some focusing on pre-literacy. This led us to hypothesize that MOCEP could improve areas of communicative language ability, such as pragmatic knowledge which refers to the ability to communicate the proper and contextually appropriate meaning. Given the paucity of measures and data emerging from culturally comparable contexts, we can only speculate about the meaningfulness of these results. Possible explanations for the lack of measurable effects on other child outcomes may be related to the fact that the majority of children already had access to early childhood development and education programs. This means that, in the study sites, MOCEP functioned as a supplemental program for school readiness and child development. Furthermore, the sample size and age-range of children limited our ability to determine age- and site-specific impacts. Additionally, since we did not follow longitudinally the trajectory of children into primary school entry, it was not possible to

determine if impacts would have manifested at a later stage of the children's development. Finally, we aimed to control for the prevalence of child disabilities across the cohorts. Close to 30% of the children had a diagnosed or possible disability, according to maternal reports. We were unable to confirm the reported (cognitive and/or physical) disabilities and recognize this as an important area of research and further inquiry in these contexts

Given the high attrition rate, it is evident that the implementation of the program must be reconsidered in light of the realities of the participating families in this context. One of the main reasons for attrition was starting a job, which reflects a possible need to explore delivery over a shorter time-span, perhaps of content targeted to the priorities of the children and families. Program burden was reported as one of the reasons for discontinuation of the program. In one of the sites the sessions had to be implemented twice instead of once a week, as originally outlined by AÇEV, in order to accommodate the schedule of the mothers. This indicates that, in this context, re-assessing program dosage and length of delivery may be necessary. Furthermore, mothers often reported difficulty in applying the CTP component of the program at home with their children (citing other responsibilities including the children's own work related to other programs). The inconsistency of the CTP application is significant because the theory of change of MOCEP suggests the cognitive enrichment component is crucial to promoting child outcomes. The next phase of the work will include determining adaptations that may be needed to reduce attrition and improve efficacy (both in terms of delivery modality and content) drawing from the impact and process evaluation results.

Our study has several limitations. First, due to ethical concerns and on the recommendation of community leaders, we chose to offer MOCEP to the control group after the intervention group had completed the program. This precluded assessment of long-term impacts of our intervention in a controlled manner. Second, as mothers in the wait-list control group were engaged very infrequently in order to promote retention, future studies should aim to replicate the findings by engaging the control group in comparable amounts of (weekly) contact. Doing so would increase confidence in the specific impacts of MOCEP over and above mere contact with the trainers. Third, the option "not sure" was inadvertently removed from Arabic version of the PSI used in this study. However, the reliability of the measure was acceptable and the marked reduction observed in the mothers who attended 14 or more sessions ($p < .0001$) indicates a strong likelihood that the level of parental stress experienced by the mothers was reduced. Fourth, our sampling process entailed the selection of participants who were in the catchment areas of local NGOs. It is likely that the mothers who enrolled in MOCEP were more likely to be involved and engaged with the community and to seek support, which may have introduced a sampling bias. More research is needed to characterize the impact of programs on subjects who are less connected, more isolated, and less likely to engage in social programs of this nature. Fifth, relying on questionnaire data to assess parental practices has limitations in cross-cultural parenting research.⁵⁶ To address this potential limitation, we administered a behavioral task in which mothers and children put a puzzle together. For our coding of maternal variables, we developed a scheme that drew from attachment theory indicating that parental responsiveness is critical for optimal

child development, and that has been applied in various cultural settings and is argued to be culturally sensitive.⁵⁷ In terms of our coding of child behaviors, while it is very likely true that levels of positive and negative affect vary across cultures, we looked at (universal) emotions within a cultural group, saw variability, and drew from existing literature on universal displays of emotion.⁵⁸

In terms of our assessment of child compliance during the task as well as synchrony, MOCEP targets both domains as outcomes, and, therefore, we applied coding schemes to assess their change upon participating in the intervention. These domains did not significantly change as a function of the intervention possibly due to the timing of the post-intervention change in behavior. Research suggests that core attitudes and knowledge may serve as a foundation for parenting practice.⁵⁹ Because we measured dyadic behavior at one point that immediately followed the completion of the intervention, we may not be allowing enough time for parents to demonstrate their full capacity for change. However, findings from a LCSM support the notion that the change in perceived parenting stress is a key outcome that may mediate the effects of MOCEP on mother-child interactions, specifically increased sensitivity, synchrony and positive regard and attenuated maternal intrusiveness. The presented LCSM converged properly and yielded an adequate overall goodness-of-fit and interpretable parameter estimates. Larger samples are needed to determine the robustness of these findings and to ascertain the reproducibility of these mediated (i.e., indirect) effects. Despite the strengths of coding dyadic interactions to overcome bias in self-reported parental behavior, we designated the measure as exploratory because of the limited psychometric data of suitable coding schemes in this context, and the potential challenges in obtaining consent from mothers to be videotaped in this cultural setting.

Our trial was also challenged by the paucity of validated measures to reliably assess holistic child outcomes in this context. We utilized instruments with limited application to children of preschool age in the Middle East to assess the possible impact of MOCEP on school readiness. We selected the SDQ because of its prolific use in multiple contexts, screening ability to detect psychosocial and behavioral adjustment issues, and the comprehensiveness of the developmental domains assessed. Some studies have utilized the SDQ in children 3 years of age and older in Arabic, but the omission of age-specific reports of the reliability coefficients is a limitation of the published literature.^{55,60} Furthermore, we applied the ALEF, a newly released measure to assess language development for which more psychometric data is needed. We also assessed other exploratory child measures (including executive function and pre-numeracy and pre-literacy skills) by applying internationally recognized scales. BSRA has also been shown to be reliable in children between 3 and 5 years of age in India.³⁶ To our knowledge, neither the BSRA nor the Bear/Dragon task have been validated in Arabic-speaking cohorts. Together, our study provides justification for more research on the area of child assessments that are contextual, valid, and fit-for-purpose in the global context.

Execution of RCTs in resource-constrained LMICs is known to be challenging, and ours was no exception. During the course of this study, participating communities faced a number of significant barriers. These included regional humanitarian crises (e.g.,

sectarian clashes, continual arrival of ever-increasing numbers of displaced families) and household-level challenges including in-home crowding and limited access to critical resources (e.g., safety, nutrition, health, income). In addition, trainers were challenged in maintaining the weekly schedule for program implementation by a number of factors, including periods of adverse weather conditions (e.g., severe sandstorms) and religious holidays (e.g., Ramadan). The asynchronous timing of the intervention is also a potential limitation of the study. A comprehensive process evaluation, focused on identification of barriers and enablers to program implementation at each study site, is forthcoming.⁶¹ Despite the challenges encountered, the demonstrated impacts of this program in critical domains of maternal wellbeing and practices supports the importance and utility of pursuing scalable parenting programs in insecure and fragile contexts.

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Figure 1
Consort Diagram

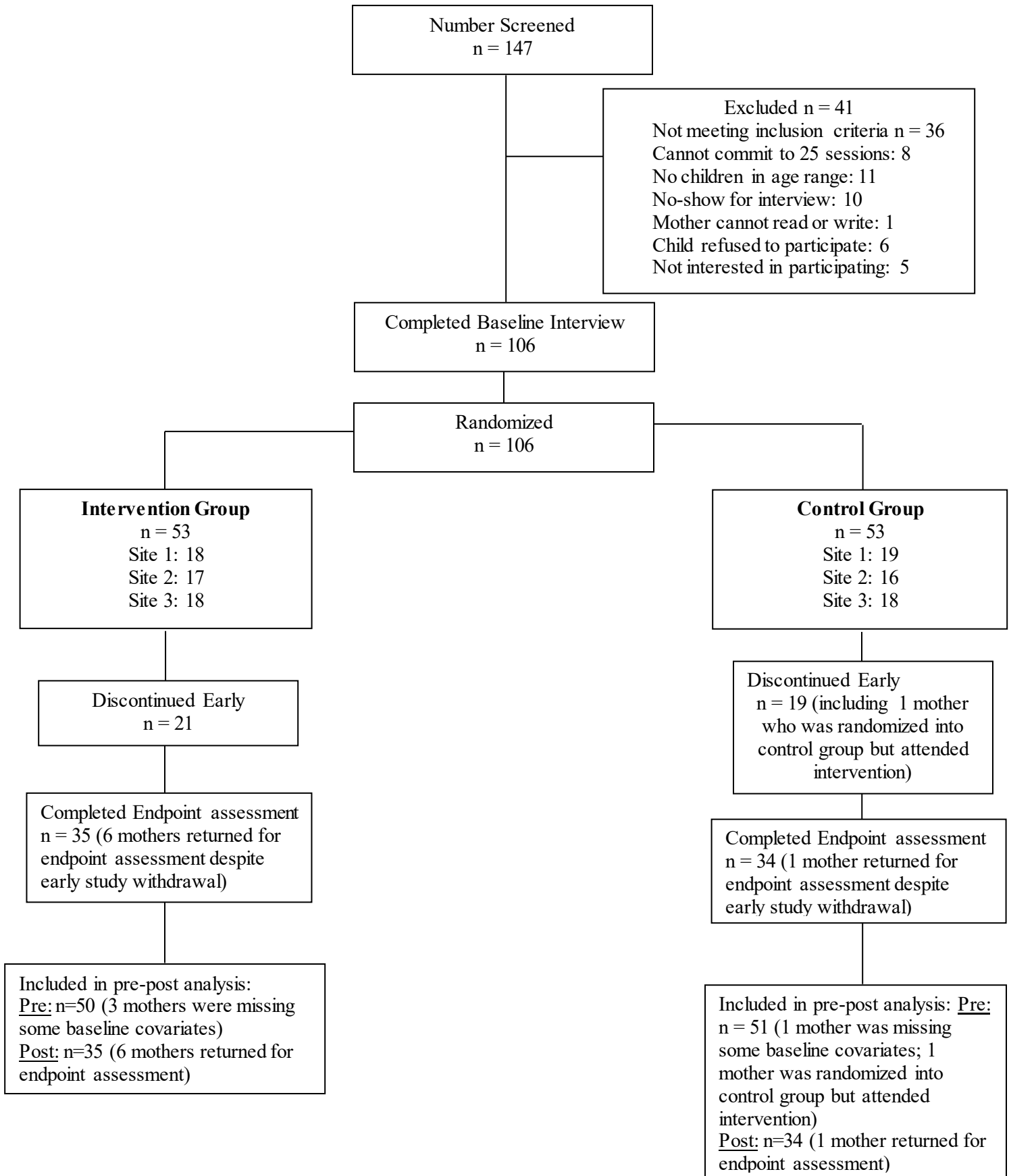


Table 1
Baseline Demographic Characteristics by Group

Variable name	Control (n=53)	Intervention (n=53)	<i>p</i> value
Maternal age, Mean (<i>SD</i>)	31.36 (5.27)	33.53 (6.19)	0.05
Marital status, <i>N</i> (%)			
Married	52 (98%)	51 (96%)	1.00
Divorced	-	1 (2%)	
Widowed	1 (2%)	1 (2%)	
Maternal education, <i>N</i> (%)			
Primary school	6 (11.32%)	10 (18.87%)	0.42
Elementary school	32 (60.38%)	22 (41.51%)	
High school	7 (13.21%)	10 (18.87%)	
Technical school	3 (5.66%)	5 (9.43%)	
University (BA, License)	5 (9.43%)	6 (11.32%)	
Maternal employment status			
Employed, <i>N</i> (%)	5 (9.43%)	6 (11.32%)	0.75
Paternal education, <i>N</i> (%)			
No school	-	1 (1.92%)	0.20
Primary school	13 (25.00%)	7 (13.46%)	
Elementary school	24 (46.15%)	30 (57.69%)	
High school	3 (5.77%)	7 (13.46%)	
Technical school	3 (5.77%)	4 (7.69%)	
University (BA, license)	6 (11.54%)	4 (7.69%)	
Unknown	3 (5.77%)	-	
Paternal employment status			
Employed, <i>N</i> (%)	42 (80.77%)	46 (90.20%)	0.32
Place of birth, <i>N</i> (%)			
This camp/neighborhood	12 (22.64%)	9 (16.98%)	0.86

Another part of Beirut	13 (24.53%)	15 (28.30%)	
Another part of Lebanon	11 (20.75%)	13 (24.53%)	
Another country	17 (32.08%)	16 (30.19%)	
Time living in Lebanon (years), Mean (<i>SD</i>)	19.87 (13.29)	19.24 (15.29)	0.82
Type of housing, <i>N</i> (%)			
Living with immediate family	47 (88.68%)	45 (86.54%)	0.88
Living with immediate family and other relatives	6 (11.32%)	6 (11.54%)	
Other	-	1 (1.92%)	
Basic needs (composite of home crowding index, food insecurity, and human insecurity), Mean (<i>SD</i>)	0.04 (0.79)	-0.04 (0.67)	0.57
Child age, Mean (<i>SD</i>)	4.32 (1.19)	4.41 (1.31)	0.72
Child gender, Boys <i>N</i> (%)	29 (54.72%)	25 (47.17%)	0.44
Child disability (diagnosed or maternal report), <i>N</i> (%)	16 (30.19%)	13 (24.53%)	0.51
Child in nursery or preschool, <i>N</i> (%)	47 (88.68%)	43 (81.13%)	0.28
Child weight-for-height z-scores, Mean (<i>SD</i>)	1.10 (2.60)	1.61 (2.32)	0.43
<i>Primary Maternal Outcomes</i>			
DSQ - Harsh Disciplinary Style	33.14 (9.44)	30.73 (7.77)	0.17
BPP - Responsive Parenting	37.9 (3.76)	36.3 (4.35)	0.05
BPP - Limit Setting	20.79 (4.66)	22.85 (2.72)	0.008
<i>Secondary Maternal Outcomes</i>			
PSI	109.81 (16.50)	108.77 (13.32)	0.72
DSSI	23.28 (4.34)	23.19 (3.97)	0.91
<i>Exploratory Maternal Outcomes</i>			
IDS	2.36 (0.54)	2.33 (0.61)	0.83
WHO-5	36.38 (26.40)	31.85 (24.17)	0.36
WEQ	18.19 (4.13)	18.62 (4.57)	0.61

FIQ Father-Child Interaction	21.08 (3.02)	20.61 (3.17)	0.44
FIQ Father-Mother Interaction	12.92 (2.42)	12.25 (2.27)	0.15
FIQ Father-Community Interaction	13.96 (1.63)	13.78 (1.75)	0.60
<i>Primary Child Outcomes</i>			
SDQ - Total Difficulties	15.10 (4.77)	14.71 (5.72)	0.71
SDQ - Prosocial	8.65 (1.67)	8.55 (1.67)	0.75
<i>Secondary Child Outcomes</i>			
PPSS	13.19 (2.23)	13.38 (1.78)	0.64
Bear/Dragon	8.78 (3.09)	10.26 (2.15)	0.008
Shape Stroop	2.82 (0.53)	2.79 (0.46)	0.77
BRSA - Letters	5.67 (4.55)	7.33 (4.89)	0.09
BRSA - Numbers	6.31 (5.00)	7.28 (5.75)	0.39
ALEF - Pragmatic Knowledge	6.81 (3.66)	7.81 (4.34)	0.23
ALEF - Receptive Vocabulary	12.96 (3.58)	14.15 (3.71)	0.11
ALEF - Sentence Completion	12.71 (3.85)	14.57 (4.48)	0.031

Notes. Primary, secondary, exploratory, and child outcomes are reported as mean with standard deviation in parentheses. Data are means (*SD*). DSQ=Disciplinary Style Questionnaire; BPP=Better Parenting Program; ECD= Early Childhood Development; PSI=Parenting Stress Index; DSSI=Duke Social Support Index; IDS= Individual Distress Scale; WHO-5= WHO-Five Well-being Index; WEQ=Women's Empowerment Questionnaire; FIQ=Father Involvement Questionnaire. SDQ= Strengths and Difficulties Questionnaire, PPSS=Peace Promotion Skills Scale.

Table 2
Pre- and Post-Intervention Maternal Outcome Measures

	Intervention		Control		<i>p</i> value	Effect size (95% CI)
	Pre (n=50)	Post (n=35)	Pre (n=51)	Post (n=34)		
Primary Outcomes						
DSQ - Harsh Disciplinary Style	30.62 (7.55)	26.91 (8.69)	33.14 (9.53)	33.41 (9.61)	0.0276	-0.76 (-1.24, -0.27)
BPP - Responsive Parenting	36.34 (4.38)	38.77 (3.17)	37.78 (3.63)	37.21 (4.50)	0.32	0.39 (-0.09, 0.86)
BPP - Limit Setting	22.78 (2.71)	22.26 (2.76)	21.08 (4.45)	22.61 (3.9)	0.87	-0.1 (-0.57, 0.38)
Secondary Outcomes						
PSI	108.86 (13.07)	98.97 (12.73)	110.53 (16.22)	112.21 (16.49)	0.0009	-0.90 (-1.39, -0.40)
DSSI	23.14 (3.76)	26.09 (3.05)	23.18 (4.39)	24.76 (3.70)	0.41	0.33 (-0.15, 0.80)
Exploratory Outcomes						
IDS	2.43 (0.66)	2.17 (0.54)	2.57 (0.70)	2.44 (0.58)	0.17	-0.40 (-0.88, 0.08)
WHO-5	32.32 (24.64)	27.54 (31.04)	35.53 (26.53)	23.29 (24.35)	0.59	0.17 (-0.31, 0.64)
WEQ	18.70 (4.51)	20.37 (2.33)	18.08 (4.17)	19.44 (4.22)	0.12	0.21 (-0.26, 0.69)
FIQ Father-Child Interaction	20.48 (3.05)	20.18 (2.94)	21.12 (3.05)	20.39 (3.16)	0.30	-0.07 (-0.55, 0.41)
FIQ Father-Mother Interaction	12.17 (2.23)	11.94 (2.20)	12.96 (2.47)	11.94 (2.81)	0.84	0 (-0.48, 0.48)
FIQ Father Community Interaction	13.77 (1.79)	13.97 (1.27)	13.96 (1.65)	13.67 (1.65)	0.43	0.17 (-0.31, 0.65)

Notes. Data are means (*SD*). DSQ=Disciplinary Style Questionnaire Harsh Disciplinary Style composite scores range 12-60, lower scores indicate better outcomes; BPP=Better Parenting Program: Early Childhood Development (ECD) knowledge scores range 0-17, 11-item responsive parenting subscale scores range 11-47, Limit setting scores range 7-28; PSI=Parenting Stress Index, score range 36-180, lower scores indicate better outcomes; DSSI=Duke Social Support Index, score range 11-33, higher scores indicate better outcomes; IDS= Individual Distress Scale, mean score range 1-4, lower scores indicate better outcomes; WHO-Five Well-being Index=WHO-5, score range 0-100, higher scores indicate better outcomes; WEA=Women's Empowerment, score range 8-32, higher scores indicate better outcomes; Paternal Engagement measured by Father Involvement Questionnaire (FIQ), score range 1-36 (child), 1-24 (mother), and 1-20 (community), lower scores indicate better outcomes

Table 3
Pre- and Post-Intervention Child Outcome Measures

	Intervention		Control		<i>p</i> value	Effect size (95% CI)
	Pre (<i>n</i> =50)	Post (<i>n</i> =35)	Pre (<i>n</i> =51)	Post (<i>n</i> =34)		
SDQ - Total Difficulties	14.44 (5.45)	12.63 (5.79)	15.04 (4.80)	13.88 (5.14)	0.79	-0.24 (-0.72, 0.23)
SDQ - Prosocial	8.52 (1.67)	8.97 (1.81)	8.67 (1.68)	8.79 (1.56)	0.45	0.11 (-0.37, 0.58)
Bear/Dragon	10.24 (2.18)	9.27 (3.48)	8.77 (3.12)	9.09 (3.21)	0.97	0.07 (-0.42, 0.55)
Shape Stroop	2.82 (0.44)	2.88 (0.55)	2.81 (0.53)	2.85 (0.44)	0.72	0.06 (-0.42, 0.5)
BRSA - Letters	7.25 (4.98)	6.91 (5.00)	5.72 (4.59)	6.27 (4.62)	0.57	0.13 (-0.35, 0.62)
BRSA - Numbers	7.38 (5.80)	8.59 (5.84)	6.36 (5.05)	8.64 (6.36)	0.77	-0.01 (-0.5, 0.48)
ALEF - Pragmatic Knowledge	7.89 (4.42)	9.82 (4.17)	6.87 (3.67)	7.68 (3.87)	0.036	0.53 (0.03, 1.03)
ALEF - Receptive Vocabulary	14.18 (3.79)	15.15 (2.98)	12.96 (3.62)	14.77(3.01)	0.33	0.1 (-0.39, 0.59)
ALEF - Sentence Completion	14.64 (4.55)	15.03 (5.00)	12.73 (3.89)	13.77 (3.39)	0.49	0.3 (-0.20, 0.79)
PPSS	13.35 (1.79)	13.74 (1.36)	13.18 (2.25)	13.76 (1.41)	0.54	-0.01 (-0.49, 0.47)

Notes. Data are means (*SD*). SDQ = Strengths and Difficulties Questionnaire, scores range 0-40 (total difficulties) and 0-10 (prosocial), lower scores indicate better outcomes; PPSS = Peace Promotion Skills Scale, scores range 5-20, higher scores indicate better outcomes; Bear/Dragon scores range 0-12, higher scores indicate better outcomes; Shape Stroop scores range 0-3, higher scores indicate better outcomes; Bracken School Readiness Assessment: Letters Subtest scores range 0-15, Numbers Subtest scores range 0-18, higher scores indicate better outcomes; ALEF: Pragmatic Knowledge scores range 0-21, Receptive Vocabulary scores range 0-25, Sentence Completion scores range 0-25, higher scores indicate better outcomes.

Table 4

Maternal and Child Pre-post Outcomes for Mothers who completed 14 or more sessions of the MOCEP program

	Before program (n=31)	After program participation (n=31)	p value	Effect size (95% CI)
<i>Maternal outcomes</i>				
DSQ - Harsh Disciplinary Style	29.39 (8.45)	25.77 (7.38)	0.013	-0.46 (-0.97, 0.06)
BPP - Responsive Parenting	36.9 (3.9)	38.9 (2.6)	0.005	0.61 (0.10, 1.11)
BPP - Limit Setting	22.33 (2.48)	22.26 (2.8)	0.88	-0.03 (-0.53, 0.48)
PSI total	108.8 (12.68)	97.8 (12.01)	<0.0001	-0.89 (-1.41, -0.37)
DSSI	23.3 (3.73)	26.5 (2.64)	0.0001	1.00 (0.48, 1.53)
IDS	2.46 (0.66)	2.15 (0.51)	0.0075	-0.53 (-1.04, -0.02)
WHO-5	31.2 (27.47)	29.3 (31.4)	0.71	-0.07 (-0.56, 0.43)
WEQ	17.8 (4.79)	20.3 (2.47)	0.003	0.70 (0.19, 1.22)
FIQ Father-Child Interaction	20.90 (3.04)	19.90 (2.89)	0.05	-0.34 (-0.85, 0.18)
FIQ Father-Mother Interaction	12.31 (1.89)	11.73 (2.13)	0.055	-0.29 (-0.8, 0.22)
FIQ Father-Community Interaction	13.76 (1.99)	14.03 (1.19)	0.6	0.17 (-0.34, 0.68)
<i>Child outcomes</i>				
SDQ - Total Difficulties	14.4 (6.16)	12.3 (5.97)	0.056	-0.35 (-0.80, 0.24)
SDQ - Prosocial	8.42 (1.86)	8.97 (1.87)	0.14	0.29 (-0.21, 0.79)
Bear/Dragon	10.2 (2.32)	9.4 (3.4)	0.15	-0.28 (-0.80, 0.25)
Shape Stroop	2.9 (0.36)	2.9 (0.58)	0.65	0 (-0.52, 0.52)
BRSA - Letters	7.9 (5.16)	7.2 (5.0)	0.36	-0.13 (-0.66, 0.39)
BRSA - Numbers	8.0 (5.83)	9.1 (5.73)	0.37	0.19 (-0.34, 0.71)
ALEF - Pragmatic Knowledge	8.4 (4.44)	10.0 (3.86)	0.019	0.40 (-0.13, 0.92)
ALEF - Receptive Vocabulary	14.1 (4.42)	15.5 (2.76)	0.16	0.37 (-0.15, 0.90)
ALEF - Sentence Completion	15.8 (4.65)	15.8 (4.70)	1.00	0 (-0.52, 0.52)
PPSS	13.6 (1.52)	13.8 (1.29)	0.58	0.17 (-0.33, 0.67)

Notes. DSQ = Disciplinary Style Questionnaire; BPP = Better Parenting Program; PSI = Parenting Stress Index; DSSI=Duke Social Support Index; IDS= Individual Distress Scale; WHO- 5= WHO-Five Well-being Index; WEQ = Women's Empowerment

Questionnaire; Father Involvement Questionnaire = FIQ; SDQ = Strengths and Difficulties Questionnaire, PPSS = Peace Promotion Skills Scale.

Supplemental Table 1

Pre- and Post-Intervention Dyadic Interaction Measure

	Intervention		Control		<i>p</i> value
	Pre (n=45)	Post (n=28)	Pre (n=47)	Post (n=30)	
Dyadic Interactions					
Maternal Positive Regard	3.15 (.16)	2.87 (.19)	2.67 (.15)	2.50 (.18)	.72
Maternal Intrusiveness	2.17 (.16)	1.77 (.19)	2.29 (.15)	2.22 (.17)	.20
Maternal Disengagement	1.18 (.07)	1.18 (.09)	1.02 (.04)	1.00 (.05)	.77
Maternal Sensitivity	3.03 (.15)	3.20 (.18)	2.78 (.14)	2.85 (.17)	.69
Child Positive Affect	2.91 (.13)	3.10 (.16)	2.80 (.13)	3.19 (.16)	.45
Child Negative Affect	1.60 (.11)	1.30 (.14)	1.60 (.11)	1.50 (.13)	.38
Child Non-Compliance	1.14 (.08)	1.10 (.1)	1.23 (.08)	1.03 (.10)	.43
Parent-Child Synchrony	2.92 (.15)	3.16 (.19)	2.89 (.15)	3.00 (.18)	.67

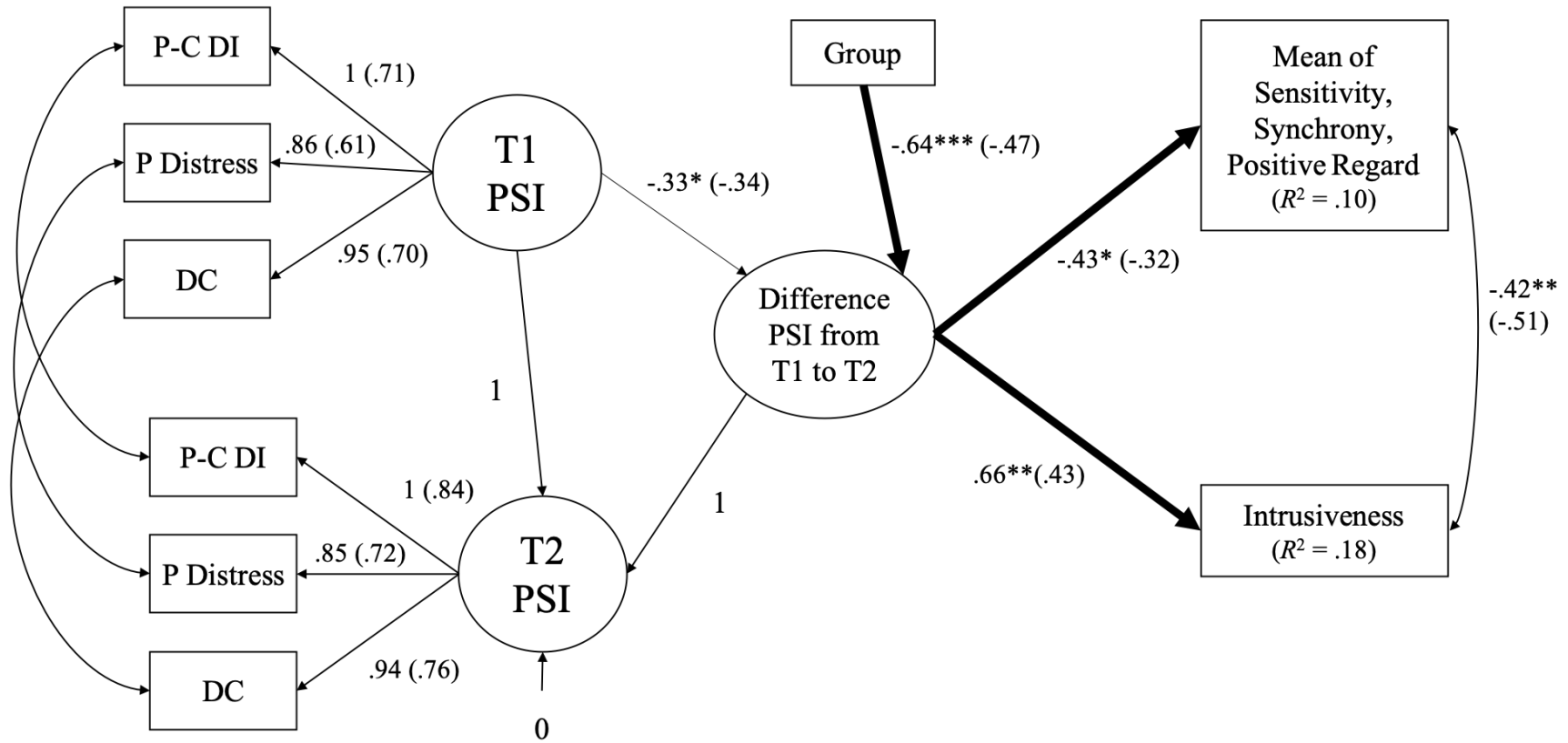
Notes. $N = 92$ (data from 14 mother-child dyads were missing at baseline). These ratings were based on the blindly-coded assessments of the mother-child videotaped interactions (see text). High dyadic scores were provided for high positive dyadic synchrony. Low scores were provided for disconnected, asynchronous behavior and/or mutual displays of negative affect.

Supplemental Table 2

Longitudinal Invariance Testing of Parenting Stress (PSI) Measurement Models

<i>Parenting stress (n = 105)</i>							
Model (<i>df</i>)	χ^2	<i>p</i>	$\Delta\chi^2$	CFI	Δ CFI	RMSEA (CI)	SRMR
1. Configural invariance (5)	0.51	.992	-	.1.00	-	.000 (.000-.000)	.011
2. Metric/weak invariance (7)	2.33	.939	2. vs. 1.:	1.00	0	.000 (.000-.026)	.025
			1.82 (2), ns				

Notes. Analyses were conducted in *Mplus* version 7.4 using a robust maximum likelihood estimator (MLR). Covariances between the same items measured at baseline and endpoint were freely estimated to account for indicator-specific effects over time. χ^2 = chi-square; *df* = degrees of freedom; *p* = *p* value of the chi-square test; $\Delta\chi^2$ = *p* value of the chi-square difference test; CFI = Comparative fit index; Δ CFI = difference in the CFI value (assuming baseline model to be correct); RMSEA = root mean square error of approximation; CI = 90% confidence interval of RMSEA value. ns = not significant (*p* > .05).



Supplemental Figure 1. Latent change score model of the change in parenting stress (as measured with the Parenting Stress Index; PSI). T1 = baseline. T2 = endpoint. P-C DI = Parent-Child Dysfunctional Interaction subscale of the PSI. P Distress = Parental Distress subscale of the PSI. DC = Difficult Child subscale of the PSI). Group designates the wait-list control group (dummy-coded as 0) and the intervention group (dummy-coded as 1). Unstandardized estimates are reported with standardized parameters in parentheses. Paths in bold indicate significant indirect effects. $\chi^2 (df = 24) = 24.34, p = .44$; RMSEA = .012, 90%-CI = [.000 - .080]; CFI = .998; SRMR = .059.

Supplemental Table 3

Post-Intervention Maternal Outcome Measures from multiple imputations

	Intervention <i>M (SD)</i>	Control <i>M (SD)</i>	<i>t</i>	<i>p</i> value
DSQ - Harsh Disciplinary Style	27.34 (10.38)	33.23 (11.05)	2.82	.007
BPP - Responsive Parenting	38.52 (4.12)	37.27 (5.09)	-1.37	.175
BPP - Limit Setting	22.18 (3.60)	22.39 (4.95)	0.26	.799
PSI	99.43 (16.34)	112.06 (18.42)	3.79	.0003
DSSI	26.21 (3.79)	24.71 (4.54)	-1.86	.068
WHO-5	7.01 (8.71)	5.89 (7.47)	-0.73	.47
WEQ	20.39 (3.16)	19.42 (4.46)	-1.26	.212
FIQ Father-Child Interaction	18.07 (2.64)	18.02 (3.20)	-0.10	.922
FIQ Father-Mother Interaction	24.73 (3.41)	24.54 (3.71)	-0.27	.792
FIQ Father Community Interaction	11.05 (1.71)	11.31 (1.89)	0.75	.454
IDS total score	2.19 (0.62)	2.44 (0.69)	2.01	.049

Notes. DSQ Harsh Disciplinary Style composite = sum of the following subscales “arguing”, “shaming”, “ignoring”, “harsh verbal discipline” and “physical punishment”

Supplemental Table 4

Post-Intervention Child Outcome Measures from multiple imputations

	Intervention <i>M (SD)</i>	Control <i>M (SD)</i>	<i>t</i>	<i>p</i> value
SDQ - Total Difficulties	12.84 (6.41)	13.91 (6.29)	0.85	.399
SDQ - Prosocial Behavior	8.84 (2.09)	8.76 (2.13)	-0.20	.839
Bear/Dragon	9.35 (4.37)	8.98 (4.02)	-0.46	.645
Shape Stroop	2.88 (0.65)	2.85 (0.58)	-0.20	.841
BRSA - Letters	6.96 (6.26)	6.11 (5.79)	-0.71	.479
BRSA - Numbers	8.55 (7.35)	8.58 (7.63)	0.03	.980
ALEF - Pragmatic Knowledge	9.92 (4.90)	7.63 (5.39)	-2.20	.033
ALEF - Receptive Vocabulary	15.24 (3.71)	14.50 (3.75)	-1.02	.314
ALEF - Sentence Completion	15.19 (5.87)	13.44 (4.83)	-1.67	.102
PPSS	13.72 (1.56)	13.80 (1.83)	0.25	.805

Supplemental Table 5

Post-Intervention Dyadic Interaction Measures from multiple imputations

	Intervention <i>M (SD)</i>	Control <i>M (SD)</i>	<i>t</i>	<i>p</i> value
Maternal Positive Regard	2.93 (1.57)	2.52 (1.52)	-1.42	.162
Maternal Intrusiveness	1.75 (1.11)	2.24 (1.54)	1.92	.060
Maternal Disengagement	1.17 (0.70)	0.99 (0.45)	-1.58	.123
Maternal Sensitivity	3.19 (1.29)	2.89 (1.35)	-1.22	.229
Child Positive Affect	3.14 (1.14)	3.12 (1.16)	-0.05	.959
Child Negative Affect	1.31 (0.88)	1.51 (0.93)	1.15	.256
Child Non-Compliance	1.11 (0.66)	1.03 (0.43)	-0.72	.478
Parent-Child Synchrony	3.15 (1.35)	3.01 (1.32)	-0.56	.578