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Effectiveness of the Parents Plus Early Years Program Among Families Living in Post-Earthquake Container Settlements in Türkiye

Türkiye'de Deprem Sonrası Konteyner Yerleşimlerinde Yaşayan Ailelerde Parents Plus Erken Yaşlar Programının Etkililiği

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ABSTRACT

Objectives: The effectiveness of the Parents Plus Early Years (PPEY) program on parental stress, family functioning, and children's emotional and behavioral outcomes was evaluated among families living in post-earthquake container settlements and exposed to high psychosocial risk.

Materials and Methods: This study employed a single-group pre-post design among parents of children aged 3-6 years residing in post-earthquake container settlements in Elazığ, Türkiye. A total of 21 parents who completed the program and assessment process were included in the analyses. The intervention consisted of nine sessions delivered weekly over a 15-week period, including baseline and post-intervention assessments. Data were collected using the Strengths and Difficulties Questionnaire, the parenting stress index, and the family assessment device. Pre- and post-intervention differences were analyzed using paired-samples t-tests.

Results: Following the intervention, parental stress decreased significantly across all subscales of both the child and parent domains, as well as in the total scores (all $p<0.001$). Significant improvements were observed across all domains of family functioning (all $p<0.001$). Scores for attention-deficit/hyperactivity, conduct problems, emotional symptoms, and peer problems decreased significantly (all $p<0.001$), whereas prosocial behavior scores increased ($p=0.001$).

Conclusion: Participation in the PPEY program was associated with significant and multidimensional changes in parental stress, family functioning, and children's emotional and behavioral outcomes in high-risk post-disaster settings. These findings underscore the relevance of structured, evidence-based parenting interventions for families affected by disasters.

Keywords: Earthquakes, parenting, parent training, family functioning, parental stress, child behavior, early childhood

ÖZ

Amaç: Deprem sonrası konteyner yerleşimlerinde yaşayan ve yüksek psikososyal risk altındaki ailelerde Parents Plus Erken Yaşlar (PPEY) programının ebeveyn stresi, aile işlevselliği ve çocukların duygusal-davranışsal sonuçları üzerindeki etkisi değerlendirilmiştir.

Gereç ve Yöntem: Bu çalışma, Elazığ'da deprem sonrası konteyner yerleşimlerinde yaşayan 3-6 yaş arası çocuğa sahip ebeveynlerde tek gruplu ön test-son test tasarımında yürütülmüştür. Programa katılan ve değerlendirme sürecini tamamlayan 21 ebeveyn analize dahil edilmiştir. Müdahale, başlangıç ve son değerlendirme süreçlerini de kapsayan 15 haftalık bir dönem içinde haftalık olarak yürütülen dokuz oturumdan oluşmaktadır. Veri toplama araçları olarak güçler ve güçlükler anketi, ebeveyn stres ölçeği ve aile değerlendirme ölçeği kullanılmıştır. Ön test ve son test ölçümleri arasındaki farklar eşleştirilmiş örneklem t-testi ile analiz edilmiştir.

Bulgular: Müdahale sonrasında ebeveyn stresinin hem çocuk hem ebeveyn alanına ait tüm alt ölçeklerde ve toplam puanlarda anlamlı düzeyde azaldığı saptanmıştır (tüm $p<0,001$). Aile işlevselliğinin tüm boyutlarında anlamlı iyileşmeler gözlenmiştir (tüm $p<0,001$). Dikkat eksikliği/hiperaktivite, davranış sorunları, duygusal belirtiler ve akran sorunlarına ilişkin puanlar anlamlı düzeyde azalırken (tüm $p<0,001$), prososyal davranış puanlarında anlamlı artış saptanmıştır ($p=0,001$).

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ÖZ

Sonuç: PPEY programına katılımın, yüksek riskli afet sonrası koşullarda ebeveyn stresi, aile işlevselliği ve çocukların duygusal ve davranışsal sonuçlarında anlamlı ve çok boyutlu değişimlerle ilişkili olduğu görülmüştür. Bu bulgular, afetlerden etkilenen aileler için yapılandırılmış ve kanıta dayalı ebeveynlik müdahalelerinin önemini vurgulamaktadır.

Anahtar Kelimeler: Deprem, ebeveynlik, ebeveyn eğitimi, aile işlevselliği, ebeveyn stresi, çocuk davranışı, erken çocukluk

Introduction

Natural disasters, particularly earthquakes, are major events that profoundly affect individuals and communities across multiple domains. Such events not only result in loss of life and property but also disrupt essential social services, including education, healthcare, and housing, thereby significantly compromising living conditions. The multifaceted impact of disasters may exacerbate existing social problems while also giving rise to new psychosocial challenges.[1,2]

Post-disaster psychosocial difficulties tend to be more pronounced and persistent among disadvantaged populations.[3] Following the 6.8-magnitude earthquake that struck Elazığ, Türkiye, in 2020, many families lost their homes or were unable to return due to severe structural damage.[4] A substantial proportion of these families relocated to temporary housing settings, such as container settlements, where they were often required to remain for extended periods due to socioeconomic constraints. Displacement and prolonged residence in temporary housing have been associated with increased levels of psychological distress, including stress, depression, and adjustment difficulties, particularly among socioeconomically disadvantaged families. These conditions may adversely affect parental mental health and, in turn, negatively influence children's developmental and psychosocial outcomes.[5-7]

In this context, structured psychosocial support programs targeting parents play a critical role in post-disaster recovery. The literature indicates that parenting interventions implemented among disadvantaged groups, such as refugees and migrants, are associated with improvements in children's social, emotional, and cognitive development.[8] Similarly, interventions targeting children and families affected by disasters have demonstrated the effectiveness of developmentally appropriate and caregiver-focused approaches in reducing psychological distress and improving child adjustment.[9,10] Evidence from systematic reviews and randomized controlled trials suggests that parenting-focused interventions can lead to improvements in children's emotional and behavioral outcomes, particularly in high-risk and trauma-exposed populations.[11,12] Furthermore, participation in structured parenting programs has been consistently associated with enhanced parent-child interactions, more effective limit-setting practices, and improved family communication.[13,14]

Despite this growing body of evidence, research on structured parenting interventions specifically targeting disaster-affected populations remains limited. Family environment and parenting practices play a critical role in children's emotional and behavioral development, particularly during early childhood.[15,16] Moreover, most existing studies have examined the effects of parenting interventions in a unidimensional manner, whereas comprehensive approaches that simultaneously evaluate parental, family-level, and child-related outcomes are relatively scarce. This gap highlights the need for studies investigating the multidimensional impact of parenting interventions from the individual level to the broader family system and child outcomes.

The Parents Plus Early Years (PPEY) program is an evidence-based parenting intervention grounded in social learning theory and positive parenting principles. The program aims to strengthen parent-child relationships and reduce problem behaviors by equipping parents with skills to manage challenging behaviors, promote positive communication, and implement consistent discipline strategies. Controlled studies have demonstrated that this program leads to significant improvements in parenting practices and child behavioral outcomes in early childhood populations with behavioral and developmental difficulties.[17,18] A study conducted in Türkiye also reported that a version of the Parents Plus Program resulted in significant improvements in child symptoms, parental stress, and family functioning.[19] The program's strengths-based orientation and structured content make it particularly suitable for implementation in high-risk and disadvantaged populations.

The present study aimed to evaluate the effectiveness of the PPEY program, an evidence-based parenting intervention, among families residing in post-earthquake container settlements in Türkiye. Rather than providing general psychosocial support, the program specifically focuses on strengthening parenting skills and enhancing parent-child relationships in a highly vulnerable context. The study examined changes in parental stress and family functioning, as well as children's emotional and behavioral difficulties and prosocial behaviors. It was hypothesized that participation in the program would lead to improvements in parenting practices and family well-being, with corresponding positive outcomes for children. By addressing a notable gap in the literature on structured parenting interventions in post-disaster settings, the findings are expected to contribute to the evidence base and inform the development and dissemination of targeted interventions for disadvantaged populations.

Materials and Methods

Study Design and Participants

This study was conducted using a single-group pre-post evaluation design to examine the effects of the PPEY program on parenting practices, family functioning, and children's emotional and behavioral outcomes among parents of children aged 3-6 years living in post-earthquake container settlements in Elazığ, Türkiye (Aşağı Demirtaş, Kırklar, and Doğukent).

The study population comprised all eligible parents residing in these settlements, and no sampling procedure was applied. All accessible parents were invited to participate in the program. In this context, the inclusion of a no-intervention control group was not feasible, given the high psychosocial vulnerability of the target population.

Participants were excluded if the child had a neurodevelopmental disorder, genetic condition, or chronic neurological illness, or if the parent had cognitive impairment or a history of psychiatric disorder prior to the earthquake. Among those who participated in the program, data from 21 parents who attended all sessions and completed the assessment process were included in the analyses.

Procedure

Face-to-face interviews were conducted with all participants. Prior to the program, parents completed the Strengths and Difficulties Questionnaire (SDQ), the parenting stress index (PSI), and the family assessment device (FAD). In addition, sociodemographic characteristics and children's developmental histories were obtained using a structured data collection form.

The PPEY program was delivered between June and October 2022 in weekly group sessions, each lasting approximately 120 minutes. The program aimed to equip parents with structured skills to manage child behavior, promote positive parenting practices, and enhance parent-child interactions. Post-intervention assessments were conducted one month after completion of the final session using the same instruments administered at baseline. Due to the field-based nature of the study and limited personnel availability, these assessments were conducted by the same researcher who delivered the intervention. All measures were collected using anonymized self-report questionnaires.

The study was conducted in accordance with the Declaration of Helsinki and approved by the Fırat University Non-Interventional Research Ethics Committee (approval no: 2022/08-25, date: 07.06.2022). Written informed consent was obtained from all participants.

Measures

Sociodemographic Data Form

A structured sociodemographic data form developed by the researchers was used to collect information on participants' and children's characteristics, including child age, sex, and number of siblings; parental age, education level, and employment status; as well as family type and household income. Data were obtained through face-to-face interviews.

Strengths and Difficulties Questionnaire

The SDQ, developed by Goodman,[20] is a 25-item instrument used to assess children's emotional and behavioral characteristics. It comprises five subscales: emotional symptoms, hyperactivity/inattention, conduct problems, peer problems, and prosocial behavior. Each subscale can be scored separately, and the sum of the first four subscales yields the total difficulties score. Higher scores (excluding the prosocial subscale) indicate greater levels of difficulties. The Turkish validity and reliability studies were conducted by Dursun et al.[21] and Güvenir et al.[22] for different age groups.

Family Assessment Device

The FAD, developed by Epstein et al.,[23] is a self-report instrument that evaluates family functioning based on individuals' perceptions. The scale consists of 60 items and includes seven subscales: problem solving, communication, roles, affective responsiveness, affective involvement, behavior control, and general functioning. It is scored using a 4-point Likert scale, with higher scores indicating poorer family functioning. The Turkish validity and reliability study was conducted by Bulut.[24]

Parenting Stress Index

The PSI, developed by Abidin,[25] assesses stress related to the parenting role. The scale consists of two domains: child domain and parent domain. The child domain includes subscales of hyperactivity/inattention, acceptability, mood, adaptability, and demandingness, whereas the parent domain includes competence, attachment, role restriction, depression, spousal relationship, isolation, and health. The scale is rated on a 5-point Likert scale, with higher scores indicating higher levels of parenting stress. The Turkish validity and reliability study was conducted by Çekiç et al.[26]

Intervention Procedure

The PPEY program was implemented using a structured facilitator manual and standardized parent training materials. The program provided written and visual content aimed at enhancing parents' skills in managing child behavior, promoting positive parenting practices, and strengthening parent-child interactions. Throughout the sessions, parents were supported in developing appropriate responses to problem behaviors, reinforcing positive behaviors, and establishing consistent boundaries. The program was delivered in group-based sessions, and all procedures were carried out in accordance with the standard program protocol.

The intervention was delivered by the first author, a child and adolescent psychiatrist who completed the official parents plus facilitator training and obtained certification in the program. Sessions were conducted in a designated setting within the container settlement, specifically prepared for group-based interventions to ensure a safe and supportive environment.

The program was implemented over 15 weeks and consisted of 9 sessions delivered on a weekly basis, including baseline and post-intervention assessment periods. A total of 26 parents were initially enrolled, of whom 21 completed the program and were included in the final analyses. Participants were allowed to miss up to two sessions; those who were absent for more than two sessions were excluded from the final analyses. The overall session attendance rate was approximately 88%. Five participants withdrew from the study due to scheduling

conflicts, illness, and competing commitments that prevented regular attendance.

To ensure intervention fidelity and adherence to the standardized protocol, regular supervision was provided by the second and third authors. This process ensured consistency, quality, and alignment with the principles of the parents plus model.[17]

Statistical Analysis

Statistical analyses were performed using IBM SPSS version 23.0 (IBM Corp., Armonk, NY, USA). The normality of continuous variables was assessed using the Shapiro-Wilk test. Paired-samples t-tests were used to compare pre- and post-intervention measurements for normally distributed variables. Continuous variables are presented as mean ± standard deviation (SD), and categorical variables as frequencies (n) and percentages (%). A p-value of <0.05 was considered statistically significant.

In addition, effect sizes were calculated using Hedges' g for paired samples to account for small sample bias. Standardized mean differences were computed based on pooled SDs, and Hedges' correction factor was applied. 95% confidence interval were calculated for all effect size estimates.

Results

Sociodemographic Characteristics

The sociodemographic characteristics of the participants are presented in Table 1. The mean age of the children was 5.00±0.78 years, and 66.7% were female. The mean age of mothers was 35.43±5.20 years, while the mean age of fathers was 38.38±4.94 years.

Pre-Intervention and Post-Intervention Comparisons (Child Behavioral and Emotional Problems, Family Functioning, and Parenting Stress)

As shown in Table 2, significant reductions were observed in all subscales of the PSI following the intervention. In the child domain, scores for supported parent, mood, acceptability, adaptability, demandingness, and inattention/hyperactivity significantly decreased (all $p<0.001$). The total child domain score also showed a marked reduction (161.33±17.32 to 123.33±14.73, $p<0.001$).

Similarly, in the parent domain, all subscales—including competence, attachment, role restriction, depression, spouse relationship, social isolation, and health—demonstrated significant decreases after the intervention (all $p<0.001$). The total parent domain score significantly decreased (186.57±18.83 to 153.24±14.68, $p<0.001$).

Overall, the total parenting stress score showed a substantial reduction following the intervention (347.90±33.81 to 276.57±27.30, $p<0.001$).

As presented in Table 3, statistically significant improvements were observed across all subscales of the FAD (all $p<0.001$). All subscale scores, including problem solving, communication, roles, behavior control, affective responsiveness, affective involvement, and general functioning, showed significant decreases.

Table 1. Socio-demographic and familial characteristics of participants. Data were given as mean ± standard deviation or number (%)

Variables	Number (%) or mean ± SD
Age (mean-years ± SD)	5.00±0.78
Sex	
Male	7 (33.3%)
Female	14 (66.7%)
Number of siblings	
Only child	2 (9.5%)
One sibling	5 (23.8%)
Two or more	14 (66.7%)
Age of mother (mean-years ± SD)	35.43±5.20
Level of education of the mother	
Primary school	13 (61.9%)
Middle school	7 (33.3%)
High school	1 (4.8%)
Mother's employment status	
Unemployed	20 (95.2%)
Employed	1 (4.8%)
Age of father (mean-years ± SD)	38.38±4.94
Level of education of the father	
Primary school	6 (28.6%)
Middle school	10 (47.6%)
High school	5 (23.8%)
Father's employment status	
Unemployed	2 (9.5%)
Employed	19 (90.5%)
Family income level	
The minimum wage	15 (71.4%)
Below the minimum wage	6 (28.6%)
Family type	
Nuclear	17 (81.0%)
Extended	4 (19.0%)

Data are presented as mean ± SD or number (percentage). SD: Standard deviation

Table 4 shows the changes in SDQ scores. Significant reductions were observed in attention-deficit/hyperactivity symptoms, conduct problems, emotional problems, and peer problems following the intervention (all $p<0.001$). In contrast, prosocial behavior scores showed a significant increase (5.57±1.99 to 6.52±1.33, $p=0.001$).

Discussion

In this study, the PPEY program, delivered to families living in post-earthquake container settlements and exposed to heightened psychosocial risk, was associated with significant improvements in parental stress, family functioning, and children's emotional and behavioral difficulties. The participating families represented a highly vulnerable group characterized not only by disaster-related adversity but also by socioeconomic disadvantages. These findings suggest that parenting-based

Table 2. Changes in PSI scores following the intervention

	Pre-intervention (mean ± SD)	Post-intervention (mean ± SD)	t	p-value*	Hedges' g (95% CI)
Parenting Stress Scale (child domain)					
Supported parent	23.33±7.98	14.29±4.68	8.85	<0.001	1.37 (0.89-1.85)
Mood	18.24±3.59	11.05±1.86	15.78	<0.001	2.54 (1.73-3.35)
Acceptability	21.52±5.48	14.86±4.40	14.04	<0.001	1.30 (0.87-1.73)
Adaptability	30.00±8.06	25.14±7.52	16.93	<0.001	0.60 (0.40-0.80)
Demandingness	35.14±5.94	29.48±6.15	28.45	<0.001	0.90 (0.62-1.19)
Inattention/hyperactivity	33.10±5.14	28.52±4.85	17.35	<0.001	0.88 (0.59-1.17)
Child domain total	161.33±17.32	123.33±14.73	27.53	<0.001	2.28 (1.56-3.00)
Parenting Stress Scale (parent domain)					
Competence	46.19±4.73	39.33±3.45	10.34	<0.001	1.61 (1.04-2.19)
Attachment	22.90±3.74	18.76±3.03	15.36	<0.001	1.18 (0.79-1.56)
Role restriction	26.05±2.99	21.43±2.80	24.48	<0.001	1.54 (1.04-2.03)
Depression	29.76±5.64	24.76±5.09	22.91	<0.001	0.90 (0.61-1.18)
Spouse relationship	24.71±2.99	20.29±2.51	20.74	<0.001	1.55 (1.05-2.04)
Social isolation	19.76±3.73	15.48±3.17	16.51	<0.001	1.19 (0.80-1.58)
Health	17.19±2.87	13.19±2.71	33.47	<0.001	1.38 (0.94-1.81)
Parent domain total	186.57±18.83	153.24±14.68	27.47	<0.001	1.91 (1.31-2.51)
Total parenting stress score	347.90±33.81	276.57±27.30	33.46	<0.001	2.25 (1.54-2.95)

*: p-values were calculated using paired t-tests. Values are presented as mean ± SD. Effect sizes are reported as Hedges' g for paired samples with 95% CIs. CI: Confidence interval, SD: Standard deviation, PSI: Parenting stress index

Table 3. Changes in FAD scores following the intervention

	Pre-intervention (mean ± SD)	Post-intervention (mean ± SD)	t	p-value*	Hedges' g (95% CI)
Problem solving	2.60±0.45	1.83±0.26	13.65	<0.001	2.05 (1.41-2.70)
Communication	2.66±0.56	1.77±0.38	11.48	<0.001	1.72 (1.18-2.27)
Roles	2.67±0.47	1.68±0.25	12.38	<0.001	2.14 (1.47-2.81)
Behavior control	2.69±0.34	1.57±0.29	16.79	<0.001	3.42 (2.35-4.49)
Affective responsiveness	2.59±0.40	1.67±0.27	15.99	<0.001	2.66 (1.83-3.48)
Affective involvement	2.60±0.48	1.75±0.36	18.61	<0.001	1.96 (1.35-2.57)
General functioning	2.56±0.57	1.62±0.60	13.72	<0.001	1.54 (1.06-2.02)

*: p-values were calculated using paired t-tests. Values are presented as mean ± SD. Effect sizes are reported as Hedges' g for paired samples with 95% CIs. CI: Confidence interval, SD: Standard deviation, FDA: Family assessment device

interventions may extend beyond individual parenting practices and may be associated with multidimensional improvements across parental, familial, and child domains of family functioning.

The observed reduction in parental stress following the PPEY program is consistent with the established effectiveness of parents plus interventions. Recent meta-analyses have demonstrated that parents plus programs significantly reduce parental stress levels.[27] In the present study, large effect sizes were observed across both child- and parent-related stress domains. The finding that PPEY produced similar improvements in a highly stressful and resource-limited context, such as post-earthquake container settlements, suggests that the program is applicable not only in clinical settings but also in community-based and high-risk environments. This is further supported by studies demonstrating the effectiveness of PPEY in preschool populations as well as the broader evidence base confirming the effectiveness of parents plus programs across diverse samples.[27,28]

Consistent with these findings, the disaster literature highlights a strong association between parental psychological distress and children's mental health outcomes. Studies conducted following the Kahramanmaraş earthquake have shown that parental distress is positively associated with children's emotional and behavioral difficulties, with parenting quality

Table 4. Changes in SDQ scores following the intervention

	Pre-intervention (mean ± SD)	Post-intervention (mean ± SD)	t	p-value*	Hedges' g (95% CI)
SDQ-inattention-hyperactivity scores	5.62±1.99	3.81±0.93	6.08	<0.001	1.07 (0.74-1.40)
SDQ-conduct problems scores	4.14±1.39	2.33±1.16	16.20	<0.001	1.41 (0.97-1.85)
SDQ-emotional symptoms scores	4.10±1.76	2.05±1.24	12.68	<0.001	1.44 (0.99-1.88)
SDQ-peer relationship problems scores	4.10±1.58	2.43±1.29	13.23	<0.001	1.16 (0.80-1.51)
SDQ-total difficulties scores	17.95±4.01	10.62±2.94	18.98	<0.001	2.05 (1.41-2.69)
SDQ-strengths (prosocial behaviors) scores	5.57±1.99	6.52±1.33	-3.91	0.001	-0.57 (-0.90 to-0.24)

*: p-values were calculated using paired t-tests. Values are presented as mean ± SD. Effect sizes are reported as Hedges' g for paired samples with 95% CIs. CI: Confidence interval, SD: Standard deviation, SDQ: Strengths and Difficulties Questionnaire

partially mediating this relationship.[29] Parental stress has also been identified as a central factor in understanding children's post-disaster stress responses, accounting for a substantial proportion of the effect of disaster severity on child outcomes.[30] In this context, the reduction in parental stress observed in the present study may represent a potential mechanism through which improvements in parental well-being support children's psychological adjustment.

Meta-analytic evidence further indicates that parenting interventions incorporating behavior management and parent-child relationship components are among the most effective approaches for reducing parental stress.[31] Parents Plus programs, which integrate relationship-focused, solution-oriented, and systemic approaches, have been shown to enhance parental self-efficacy and strengthen parents' ability to manage behavioral problems, thereby reducing perceived parenting burden.[27,32] The effectiveness of PPEY in reducing parental stress within the challenging conditions of container settlements supports the potential value of structured parenting programs within post-disaster psychosocial interventions.[33,34]

The observed improvement in family functioning is consistent with the systemic framework underpinning the Parents Plus programs. These programs conceptualize the family as an interconnected system and address parent-child interactions alongside broader relational processes such as communication, role distribution, and problem-solving.[32] Meta-analyses have demonstrated that parents plus programs lead to significant improvements in child behavior, parental stress, family cohesion, and parental satisfaction.[27,32] In the present study, large effect sizes were observed across family functioning domains, supporting the magnitude of the observed improvements.

The effectiveness of PPEY in enhancing family functioning within a context characterized by high stress and uncertainty suggests that systemic parenting interventions remain applicable and beneficial under crisis conditions.

Evidence from family-based interventions conducted in disaster and migration contexts further supports improvements in family functioning. For instance, a family skills program implemented among displaced Myanmar migrant families in Thailand reported significant improvements in family functioning and cohesion along with reductions in negative interactions.[12] However, some early childhood interventions conducted in emergency settings have reported challenges in achieving expected outcomes due to barriers such as inconsistent attendance, limited physical resources, and high levels of environmental stress.[35] In this regard, the significant improvements observed in family functioning in the present study suggest that structured parenting programs such as PPEY can be effectively implemented even under highly constrained conditions.

Both theoretical and empirical studies on post-disaster contexts indicate that children's mental health outcomes are shaped not only by direct trauma exposure but also by parental mental health, parenting practices, and the broader family environment.[33,36] Models examining families affected by the Kahramanmaraş earthquake have identified economic hardship, parental depression, parent-child relationship quality, and family resources as interrelated factors influencing child outcomes, with family communication, problem-solving, and social/economic resources emerging as key protective factors.[37] Qualitative studies following flood disasters similarly emphasize the role of communication, conflict resolution, and coping skills in shaping family resilience and adaptation.[38] The PPEY program's emphasis on positive communication, collaborative limit-setting, and problem-solving may therefore represent key mechanisms underlying the observed improvements in family functioning.

In container settlement environments, where families often experience overcrowding, limited privacy, and shared living conditions, the implementation of consistent parenting practices may be particularly challenging. In such settings, maintaining clear boundaries and consistent limit-setting may be more difficult due to environmental constraints and heightened stress. At the same time, the PPEY program's emphasis on positive communication may play a critical role in supporting parent-child interactions, as it promotes more predictable, structured, and less conflictual communication patterns. These skills may therefore be particularly relevant in reducing family conflict and supporting children's emotional and behavioral regulation under such conditions.

The improvement in children's emotional and behavioral difficulties observed in this study is consistent with the existing evidence on the effectiveness of the PPEY and the broader

literature on child mental health in post-disaster contexts. Systematic reviews have demonstrated that PPEY is effective in reducing behavioral and emotional difficulties in early childhood, particularly in externalizing problems.[39] In the present study, moderate-to-large effect sizes were observed across SDQ domains. Accordingly, these findings align with the existing evidence supporting the effectiveness of PPEY in promoting positive child outcomes.

Emotional and behavioral problems are common among children exposed to disasters and may persist over time if left unaddressed.[40] Findings from the Kahramanmaraş earthquake indicate that parental distress is closely associated with child outcomes, with parenting processes potentially serving a protective role.[29] Conversely, ineffective or harsh parenting practices have been shown to increase both internalizing and externalizing problems in children.[41] These findings underscore the critical role of parenting and parent-child relationships in shaping children's psychological adjustment following mass trauma. The PPEY program, which targets skills such as positive attention, collaborative limit-setting, and solution-focused communication,[18,32], may therefore represent potential mechanisms underlying the concurrent improvements observed in children's emotional and behavioral outcomes.

Meta-analytic evidence further indicates that social learning-based programs are particularly effective in reducing externalizing problems such as aggression, oppositional behaviors, and attention difficulties.[32,42,43] The effects of parents plus programs on child behavioral outcomes are also supported by meta-analyses and have been shown to be comparable to other evidence-based parenting interventions.[27] Although effects on internalizing problems are generally more modest, programs that combine behavior management with relationship-enhancing components tend to produce stronger outcomes in this domain.[44] The integration of both components within PPEY[32,39] may account for the simultaneous improvements in both emotional and behavioral difficulties observed in the present study.

Parenting interventions implemented in humanitarian crisis settings have also been shown to improve children's behavioral and psychosocial outcomes. A randomized controlled trial conducted among displaced Myanmar families in Thailand reported reductions in children's externalizing and attention problems alongside increases in prosocial behaviors.[45] Systematic reviews focusing on forced migration and conflict contexts similarly indicate that structured parenting programs are effective in improving children's psychosocial and behavioral outcomes.[43,46] Given that container settlements share comparable risk conditions, the improvements observed in the present study are consistent with the broader literature.

Study Limitations

Several limitations should be considered when interpreting the findings of this study. First, the single-group pre-post design without a control group limits causal inferences regarding the effectiveness of the intervention. Second, the relatively small sample size may restrict the generalizability of the results to broader populations. Third, the reliance on parent-reported measures introduces the possibility of response and social desirability biases, as the absence of teacher reports or observational data prevented multi-informant validation. In addition, post-intervention assessments were conducted by the same researcher who delivered the intervention, without assessor blinding, which may have increased the risk of expectancy or demand-related response bias. Fourth, the short-term assessment precludes conclusions about the long-term sustainability of the observed improvements. Additionally, excluding children with neurodevelopmental disorders and parents with pre-existing psychiatric conditions may limit the applicability of the findings to more clinically complex populations.

The unique post-disaster context also introduced potential environmental constraints, including socioeconomic hardship and instability associated with living in container settlements. However, these challenges also represent important contextual features that should be considered when interpreting the findings.

Despite these limitations, the study has several notable strengths. It is among the first to evaluate a structured, evidence-based parenting intervention within a post-earthquake container settlement context in Türkiye. The study employed validated assessment instruments to evaluate outcomes across multiple domains, including parental stress, family functioning, and children's emotional and behavioral difficulties. By adopting a multidimensional approach, it provides a comprehensive understanding of the potential impact of parenting interventions at the parent, family, and child levels. Furthermore, the delivery of the intervention by a certified child and adolescent psychiatrist under standardized protocols and professional supervision ensured program fidelity and methodological rigor. Conducting the intervention within participants' living environments enhanced ecological validity and demonstrated the feasibility of implementing structured parenting programs in high-risk, resource-limited settings.

Conclusion

In conclusion, the findings of this study suggest that the PPEY program is associated with multidimensional improvements in parental stress, family functioning, and children's emotional and behavioral outcomes among high-risk families living in post-earthquake container settlements. These results underscore the potential value of structured, evidence-based parenting interventions in supporting families facing disaster-related adversity.

By strengthening parenting practices and enhancing family functioning during early childhood, such interventions may play a critical role in promoting children's psychological adjustment in the aftermath of disasters. The study further highlights the feasibility and applicability of parenting-based programs in community-based, resource-limited, and humanitarian

contexts. Integrating structured parenting interventions into post-disaster psychosocial support services may therefore contribute to more comprehensive and sustainable recovery efforts for disadvantaged populations.

Ethics

Ethics Committee Approval: The study was conducted in accordance with the Declaration of Helsinki and approved by the Fırat University Non-Interventional Research Ethics Committee (approval no: 2022/08-25, date: 07.06.2022).

Informed Consent: Written informed consent was obtained from all participants.

Footnotes

This study received the Turkish Association for Child and Adolescent Psychiatry Project Award at the 31st National Congress of Child and Adolescent Mental Health and Disorders (May 17-20, 2022, Çeşme/İzmir).

Authorship Contributions

Concept: E.A., B.T., O.B.D., Design: E.A., B.T., O.B.D., Data Collection or Processing: E.A., Analysis or Interpretation: B.T., O.B.D., Literature Search: E.A., B.T., Writing: E.A., B.T.

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