

RESEARCH NOTE

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Group Stepping Stones Triple P for South Korean families of children with developmental disabilities: a pilot study

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Abstract

Background/Methods Children with developmental disabilities (DDs) face behavioral, emotional, and social challenges that impact family dynamics. We aimed to investigate the feasibility and effectiveness of the Group Stepping Stones Triple P (SSTP) for South Korean families of children with DDs. Eight parents participated in six online group sessions and three individual phone sessions, supported by a behavior-tracking mobile app. To measure feasibility, satisfaction with the intervention and mobile application, along with participant retention rate, were assessed. Data were collected at three time points to assess behavior problems, quality of life (QoL), parenting stress, efficacy, and parent-child relationships. Wilcoxon signed-rank test was conducted.

Results Participants reported high satisfaction with the intervention and offered suggestions for enhancement. There were no significant improvements between pre- and post-intervention. However, significant improvements in children's behavior and QoL, parenting efficacy, positive parenting skills, and parent-child relationships were observed at the one-month follow-up. Some individual score change trends were also observed over time.

Conclusion This study is the first to conduct Group SSTP in the South Korean context. The results suggest Group SSTP's potential to address behavioral issues of children with DDs and improve parenting practices, supporting its broader application in healthcare settings.

Keywords Children with developmental disabilities, Behavior problems, Quality of life, Stepping Stones Triple P, Positive parenting program

Introduction

Developmental disabilities (DDs) involve challenges in physical, language, behavioral, and learning abilities during children's development [1]; individuals with DDs often have co-occurring conditions [2]. The 2019 Global Burden of Disease Study estimated that approximately 11.3% of children under 20 years globally have mild-to-severe disabilities, including hearing or vision loss, epilepsy, and developmental disorders [3]. Among developmental disorders, the prevalence was 3.1% for intellectual disabilities, 0.4% for autism spectrum disorder, and 1.9% for attention-deficit/hyperactivity disorder

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[3]. Children with DDs are at a significantly higher risk of experiencing behavioral and emotional difficulties than those without DDs [4, 5]. They often encounter functional difficulties related to their disabilities, along with psychosocial challenges, including social-emotional and behavioral difficulties—such as tantrums, aggression, self-injury, and irritability. This negatively impacts their mental health and quality of life (QoL) [6–8]. These difficulties extend beyond the child, contributing to increased parenting stress, reduced parenting self-efficacy, and a decline in overall family QoL [9, 10]. Family interventions effectively target the emotional and behavioral problems of children with DDs and enhance parental factors, including parenting behaviors, self-efficacy, and the relationship between the parents [11–14].

Stepping Stones Triple P (SSTP) is an intervention for families with children under 12 years with DDs, based on social learning and positive parenting principles [15, 16]. It offers a multilevel program with varying intensity to meet families' needs [15] (Details in the additional file). Systematic reviews have shown that SSTP improves behavioral outcomes in children with DDs, parenting self-efficacy, and parental relationships [17, 18]. The Level 4 Group SSTP is the most commonly implemented and effective version [17, 18]. However, research on SSTP for parents of children with DDs in Asian countries is limited. A Japanese study showed SSTP's positive effects on parenting and behavior in children aged 2–6 with autism spectrum disorder [19]. In South Korea, a study using Level 2 SSTP, with three 2-hour seminars, showed short-term benefits for children's behavioral and emotional issues and parenting practices in parents of children aged 2–10 with DDs [20].

No studies have focused on Level 4 Group SSTP and South Korean families of children with DDs. Considering the Level 4 Group SSTP's effectiveness on both children's

behavior and parenting outcomes, our pilot study investigated the feasibility and effectiveness of the modified version of the SSTP program [21] on outcomes for both children with DDs and families in South Korea.

Methods

Study design

Our study was a one-group, pre-post design pilot study. This study was based on the Resiliency Model of Family Stress, Adjustment, and Adaptation, which conceptualizes how family variables are related to family adaptation (Additional Table 1; Fig. 1) [22].

Participants

Participants were eligible if they had children aged 2–12 years with DDs and could join online group and phone sessions, following the Group SSTP guidelines [16]. Parents with children who had other medical conditions or were on medication for behavioral issues were excluded. Based on the guidelines, of 33 interested parents, 10 met the criteria and were enrolled [16].

Intervention

Intervention development

Two authors completed Level 4 Group SSTP providers training and accreditation in the United States. The research team, including two SSTP-accredited practitioners and bilingual professionals with expertise in caring for children with DDs, translated the SSTP materials into Korean. The SSTP videos were translated into Korean and dubbed by professional voice actors. We also developed a mobile app to track behavioral changes in children with DDs and their parents (Details in the additional file, Additional Fig. 1).

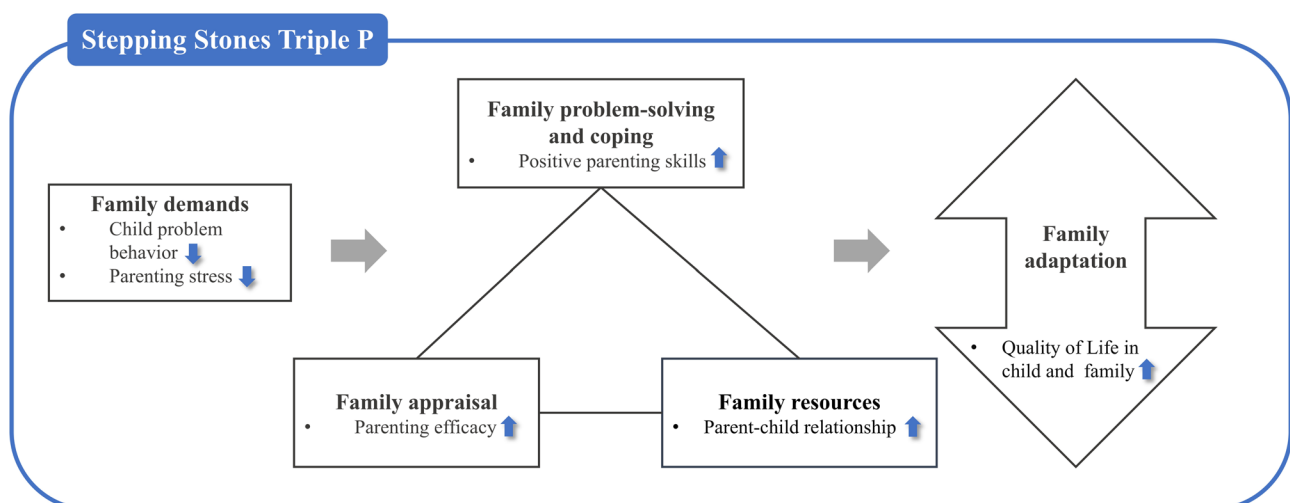


Fig. 1 The Conceptual Model. Note. Developed based on the resiliency model of family stress, adjustment, and adaptation [22]

Group SSTP

Group SSTP offered training in 25 positive parenting strategies to enhance child development and parent-child relationships [23, 24]. The program included six 2.5-hour online group sessions and three 0.5-hour weekly phone sessions led by SSTP-accredited practitioners using a Korean-version workbook. Group sessions featured presentations, videos, discussions, and role-play, while phone sessions addressed specific parenting challenges (Additional Table 2). Participants were encouraged to complete weekly exercises and use the app for daily behavior tracking.

Intervention fidelity

Multiple strategies were implemented to ensure high intervention fidelity. The training and accreditation completed by two authors was a rigorous process, ensuring all facilitators were well-versed in the intervention's theoretical foundations and protocols. Grounded in a robust theoretical framework, the SSTP program enabled facilitators to navigate unexpected questions or deviations while remaining aligned with the intervention's core philosophy. The intervention protocol was highly structured, with a detailed manual outlining session content with minute-by-minute precision. Each session included a checklist to systematically assess adherence to the protocol. We held weekly meetings to review the checklists, discuss any issues, including participant attendance and engagement, and conduct simulations of upcoming sessions to ensure consistency across facilitators.

Procedure

Participant recruitment took place from May to June 2023 through announcements at disability centers. Parents interested in the study provided their information via an online survey, followed by phone screenings to confirm eligibility. After providing informed consent, participants received a workbook and app instructions. They then downloaded the app before the intervention. Data were collected at three points: pre-test (T0), post-test (T1), and four weeks later (T2). Participants joined a 9-week program conducted by SSTP-accredited practitioners from June to August 2023. They received a gift certificate for completing the study.

Measurements

The feasibility of the intervention was evaluated by quantitative and qualitative measures of intervention satisfaction, engagement rate, and the usability of the mobile app (Additional Table 3). Additionally, children's behavioral problems, parenting stress, parenting efficacy, positive parenting skills, children's and family's QoL were evaluated with well-established measures (Additional Table 3). Among them, the KidsLife scale, used to assess children's

QoL, was translated into Korean following the translation methodology proposed by Sousa and Rojjanasrirat (2011) [25]. The detailed translation process is presented in Additional Table 3.

Statistical analysis

Data were analyzed using the IBM® SPSS® Statistics 24.0 statistical program. We analyzed the individual-level score trends of outcomes. The Wilcoxon signed-rank test was conducted to determine the short-term effectiveness (T_0 - T_1) and long-term effectiveness (T_0 - T_2) of the intervention.

Ethical considerations

This study was approved by the Institutional Review Board of Yonsei University Healthcare System (Approval No. 4-2023-0266). The research team provided the participants with detailed information regarding the study's purpose, procedures, and their rights. Participants voluntarily submitted signed informed consent forms via mail.

Results

Initially, ten people participated in the study, but two withdrew. One single mother left after the first session due to challenges managing her child during sessions. The other missed four out of five group sessions and was excluded due to insufficient understanding of the content, which impacted her ability to participate in the remaining sessions. Consequently, data from the eight participants who completed the program were included in the analysis. All participants were mothers, and their mean age was 35.5 years ($SD=4.6$). Most of the participants were married ($n=7$), had bachelor's degrees ($n=7$), and were religious ($n=7$). Six participants evaluated their economic level as medium or low. Children were predominantly boys ($n=7$), with a mean age of 5.9 years ($SD=1.2$). Five children were diagnosed with autism spectrum disorder, and three children were diagnosed with intellectual disabilities.

The participation rate of all eight participants whose data were used for analysis was 100%; however, it is important to note that two parents withdrew early. The eight participants rated their satisfaction with the program at four or higher out of five, with an average score of 28.6 ($SD=1.69$) out of 30 (Additional Table 4). Participants appreciated the program's clarity, real-life applicability, and insights into child psychology and positive parenting (Additional Table 5). They valued peer discussions and suggested shorter sessions with increased frequency and an app reminder feature. At least five participants rated each item assessing usability and usefulness of the mobile app with a score of three or more out of five, and the overall mean score was 53.0 ($SD=11.5$) out of a total of 70 (Additional Table 4).

Individual participants' scores for the major outcomes are presented in Additional Fig. 2. Additionally, statistically significant differences between T0 and T2 were observed in children's behavior problems, parenting stress, parenting efficacy, positive parenting skills, the parent-child relationship, and children's QoL (Table 1; Fig. 2).

Specifically, the mean score for children's behavior problems decreased from 115.3 (SD = 26.0) at T0 to 93.8 (SD = 18.4) at T2 and the difference was significant ($z = -2.524$, $p = .012$). Parenting stress also decreased over time, from 112.8 (SD = 30.8) at T0 to 98.6 (SD = 30.2) at T2, with significant differences between T0 and T2 ($z = -2.243$, $p = .025$). Parenting efficacy increased from 96.4 (SD = 26.9) at T0 to 116.1 (SD = 20.4) at T2,

Table 1 Short-term and Long-term effects of SSTP

Scale	Mean (SD)			$z(p)$ ($T_0^* - T_1^{**}$)	$z(p)$ ($T_0^* - T_2^{***}$)
	$T_0^* (N=8)$	$T_1^{**} (N=8)$	$T_2^{***} (N=8)$		
Children's behavior problems	115.3 (26.00)	103.5 (20.63)	93.8 (18.44)	-1.153 (0.249)	-2.524 (0.012)
Parenting stress					
Parental distress	40.1 (10.40)	38.0 (9.49)	36.9 (1.26)		
Parent-child dysfunctional interaction	37.6 (13.27)	36.6 (11.03)	32.9 (11.96)		
Difficult child	35.0 (9.07)	33.9 (9.37)	28.9 (9.76)		
Total	112.8 (30.77)	108.5 (28.28)	98.6 (30.20)	-0.140 (0.888)	-2.243 (0.025)
Parenting efficacy					
Love	9.1 (4.16)	9.5 (3.16)	10.9 (3.00)		
Control	16.9 (4.19)	18.9 (2.23)	21.3 (3.69)		
Communication	30.8 (7.69)	34.1 (5.80)	34.5 (6.00)		
Education	10.5 (4.38)	10.6 (2.88)	12.9 (2.47)		
General efficacy	29.1 (8.03)	31.6 (7.37)	36.6 (6.57)		
Total	96.4 (26.88)	104.8 (20.05)	116.1 (20.39)	-1.682 (0.092)	-2.243 (0.025)
Positive parenting skills					
Warmth and encouragement	22.4 (5.63)	23.5 (3.02)	25.3 (4.37)	-0.851 (0.395)	-2.120 (0.034)
Parent-child relationship					
Attachment	30.3 (5.82)	31.5 (3.12)	32.6 (5.48)		
Discipline practice	24.0 (4.75)	25.3 (3.01)	26.0 (3.38)		
Involvement	20.5 (6.59)	20.6 (3.11)	22.1 (4.09)		
Parental confidence	15.5 (4.41)	16.0 (4.0)	18.3 (3.69)		
Relational frustration	18.8 (4.89)	18.8 (5.68)	21.1 (3.69)		
Total	109.0 (17.28)	112.1 (11.61)	120.1 (16.64)	-0.508 (0.611)	-2.100 (0.036)
Children's QoL					
Social inclusion	9.3 (1.67)	9.3 (2.12)	10.5 (3.02)		
Self-determination	9.8 (2.19)	11.1 (2.80)	11.5 (3.02)		
Emotional well-being	6.9 (1.55)	7.8 (1.98)	10.1 (2.64)		
Physical well-being	7.5 (3.70)	7.8 (3.01)	8.5 (3.89)		
Material well-being	8.9 (3.00)	9.5 (2.78)	9.5 (3.93)		
Rights	7.0 (4.41)	6.1 (3.44)	10.0 (3.25)		
Personal development	9.0 (2.67)	8.9 (1.89)	10.5 (2.88)		
Interpersonal relationships	6.6 (4.31)	7.4 (3.42)	8.8 (3.11)		
Total	64.9 (15.19)	67.8 (15.83)	79.4 (18.67)	-0.702 (0.483)	-2.240 (0.025)
Family QoL					
Family interaction	22.1 (9.37)	21.9 (5.79)	24.8 (5.73)		
Parenting	22.0 (5.26)	23.9 (3.60)	24.5 (4.24)		
Emotional well-being	11.5 (3.34)	11.8 (4.40)	13.9 (3.94)		
Physical and material well-being	20.9 (3.18)	20.8 (2.66)	21.9 (2.17)		
Disability-related support	15.5 (2.67)	15.4 (2.92)	16.4 (1.41)		
Total	92.0 (19.66)	93.6 (16.94)	101.4 (13.90)	-0.169 (0.866)	-1.820 (0.069)

SSTP: Stepping Stones Triple P; QoL: quality of life

* Before the intervention

**Immediately after the intervention

***One month after the intervention

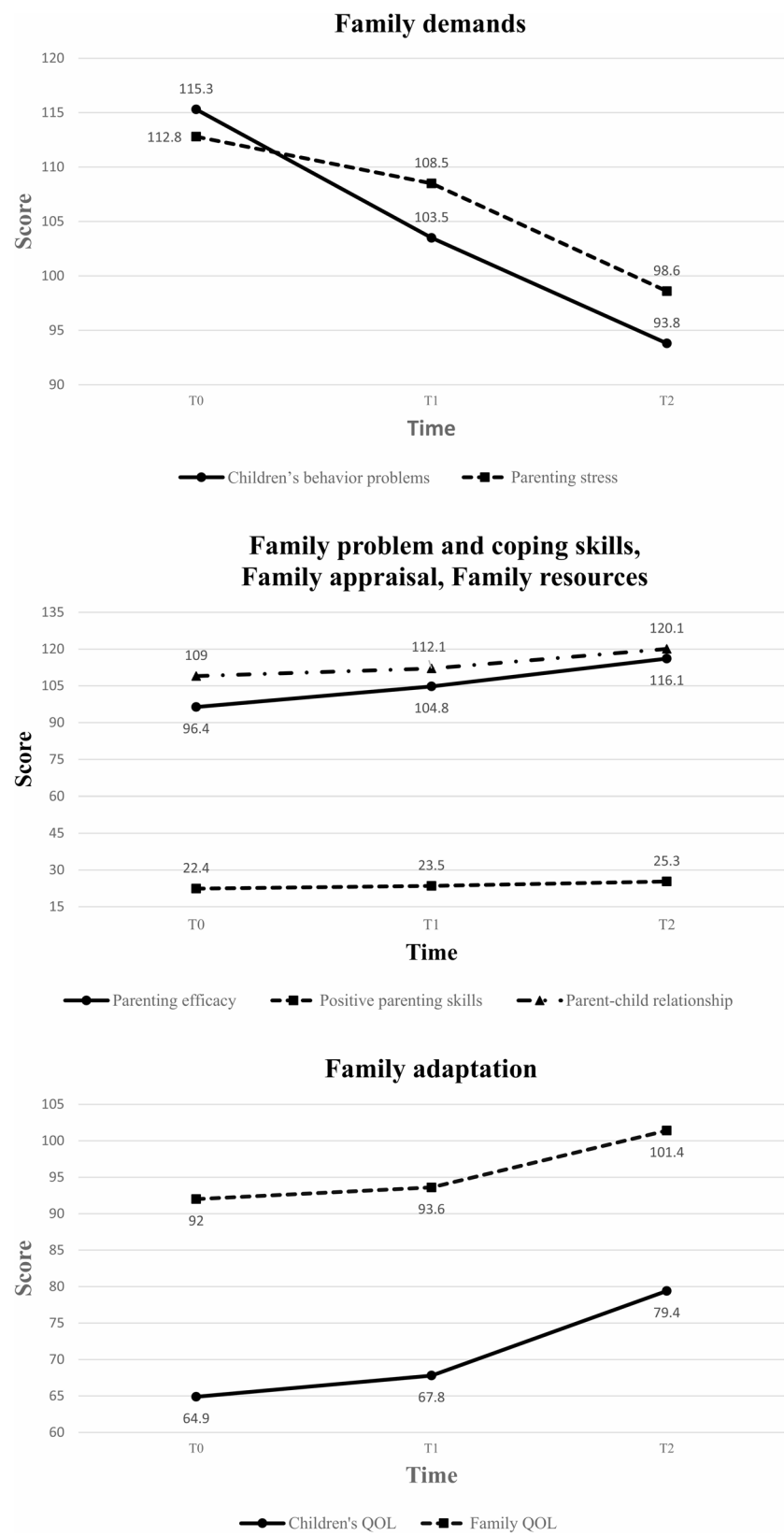


Fig. 2 Means of Child and Family Variables at Different Time Points

showing significant long-term effects ($z = -2.243$, $p = .025$), although there was no significant differences in the short-term effects. Positive parenting skills also increased, rising from 22.4 ($SD = 5.6$) at T0 to 25.3 ($SD = 4.4$) at T2, and the difference was significant ($z = -2.120$, $p = .034$). The total mean scores for parent-child relationship also increased, with mean scores rising from 109.0 ($SD = 17.3$) at T0 to 120.1 ($SD = 16.6$) at T2, and the difference was significant ($z = -2.100$, $p = .036$). Children's QoL gradually increased from 64.9 ($SD = 15.2$) at T0 to 79.4 ($SD = 18.7$) at T2, with a significant difference between T0 and T2 ($z = -2.240$, $p = .025$), despite no significant short-term effect. Family QoL scores increased from 92.0 ($SD = 19.7$) at T0 to 101.4 ($SD = 13.9$) at T2; however, these changes were not significant.

Discussion

To our knowledge, our pilot study is the first attempt to conduct Level 4 Group SSTP among South Korean families. We adapted the Group SSTP to South Korean families of children with DDs and evaluated the intervention's feasibility and effectiveness on the child and family outcomes based on the Resiliency Model [22].

Participants expressed high satisfaction with the intervention, indicating its potential in South Korea. They valued learning practical parenting skills and sharing insights with peers, with some expressing a desire to maintain connections after the sessions. While remote sessions eased participation for some, others preferred in-person meetings, suggesting that future research could offer both options. Overall, the feedback confirmed the intervention's feasibility.

However, attrition was a potential consideration in assessing the feasibility, as two parents withdrew early. One, a single mother of a child with significant behavioral challenges, discontinued after the first session due to difficulty managing her child during the session, noting the absence of caregiving support. Another mother missed several sessions due to personal reasons, without attributing her non-participation to dissatisfaction with the intervention or difficulties with the virtual format.

Compared to traditional in-person delivery, the virtual format improved accessibility, enabling parents from distant regions to participate in real time. Nevertheless, the absence of a controlled physical environment may have introduced distractions that affected retention. The challenges experienced by the caregiver may have resulted from the combination of the specific characteristics of this intervention with its online delivery format, rather than the modality alone. For example, the parent might have more readily participated in an online program that actively engaged the child, thereby reducing the cognitive and logistical demands of attending to both the session and the child simultaneously. This highlights the need

to assess not only the feasibility of the delivery modality in isolation but also the feasibility of the entire intervention package within its implementation context. Future research should explore strategies such as providing additional support for childcare or incorporating content that actively engages children.

In terms of individual-level score trends, Subject 6 demonstrated the most positive changes in all outcomes, except for the child's problem behavior, across the time points (T0–T2). The baseline scores for the outcomes were relatively unfavorable, and the mother was young and had a lower economic status. She expressed a desire to participate in an additional round of the intervention, as she found it particularly helpful in learning parenting strategies tailored to her child. This participant did not report prior intervention experience, which may help explain the notable improvements observed. On the other hand, Subject 2 exhibited the least favorable outcomes, including declines in parenting efficacy, positive parenting skills, and family QoL. Notably, this participant's baseline scores were relatively high, and her economic status was comparatively more favorable than that of other participants. The differences between the two subjects may stem from disparities in opportunities to participate in various interventions, influenced by their differing socioeconomic statuses. These patterns, though based on a small sample, highlight the importance of considering caregiver background and tailoring program outreach and delivery to reach underserved populations who may benefit most. Thus, future studies should investigate caregivers' backgrounds, including prior intervention experiences with various delivery modalities such as virtual formats, to better understand how these may influence participation and engagement. Moreover, as in other countries where SSTP is implemented nationally [26], adopting the program at a national level in South Korea may be particularly beneficial for underserved families who lack access to parenting resources.

Additionally, although Subject 2 reported a high level of satisfaction with the intervention and provided positive qualitative feedback, she rated the usability and usefulness of the mobile app the lowest among all participants and expressed difficulties with app usage. Conversely, Subject 7, who reported the second-highest ratings for the usability and usefulness of the mobile app, demonstrated the greatest reduction in the child's behavioral problems. This may suggest that the mobile app functioned as a supplementary tool in delivering the intervention, and its seamless integration into the intervention process could enhance overall effectiveness.

In terms of group level, we observed that comparisons between T₀ and immediately post-intervention (T₁) showed no statistically significant differences. However, we found significant effects of the intervention on child

and family outcomes, including children's behavior problems, QoL, parenting stress, efficacy, positive parenting behavior, and the parent-child relationship, from pre-intervention to one month post-intervention (T_2).

One possible explanation for these findings is the cumulative effects of the intervention. SSTP focuses on providing families with practical parenting strategies that align with their values and needs, aiming to empower them to manage challenges independently [23]. Even after the intervention, families continued to apply positive parenting skills, which may have contributed to the improved outcomes observed over time.

The main limitation of our study was its small sample size. Therefore, our findings should be interpreted with caution. The outcome data gathered only from participant reports may have had a self-report bias. Including other informants may provide a more balanced assessment of the intervention.

Conclusion

This study was the first to implement Group SSTP in South Korea. The results indicate that Group SSTP can reduce children's behavioral problems, improve parenting practices, and enhance family well-being among South Korean parents of children with DDs. Full-scale studies using Group SSTP may produce positive outcomes for the families, making the intervention suitable for use in healthcare settings to improve their QoL.

Abbreviations

DDs	Developmental Disabilities
QoL	Quality of Life
SSTP	Stepping Stones Triple P
T0	Pre-test/Initial assessment
T1	Post-intervention assessment
T2	Follow-up assessment

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s13104-025-07518-3>.

Additional file

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Author contributions

Jeehae Chung: Conceptualisation, Methodology, Resources, Investigation, Writing - original draft, Writing - review & editing. Eun Ju Park: Formal analysis, Investigation, Resources, Data curation, Writing - original draft, Visualisation. Hyelim Kim: Investigation, Resources, Writing - original draft, Visualisation. Anna Lee: Conceptualisation, Methodology, Validation, Investigation, Data curation, Project administration, Resources, Writing - original draft, Writing - review & editing, Supervision, Funding acquisition.

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design; the collection, analysis, and interpretation of the data; the writing of the report; or the Yonsei.

Data availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate

This study was approved by the Institutional Review Board of the Yonsei University Healthcare System (Approval No. 4-2023-0266). Participants received detailed information about the study and provided written informed consent via mail.

Competing interests

The authors declare no competing interests.

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