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Comparison of the Effectiveness of the Incredible Years Program and the Hanen Parent Training Program on Caregiver Burden among Mothers of Children with Autism Spectrum Disorder

Niloufar Sadat. Bashiri[1], Seyyedeh Olia. Emadian[2*], Seyyedeh Hamideh. salim Bahrami[2]

1 PhD Student in Educational Psychology, Sar.C., Islamic Azad University, Sari, Iran
2 Assistant Professor, Department of Psychology, Sar.C., Islamic Azad University, Sari, Iran
*Correspondence: emadian@iausari.ac.ir

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ABSTRACT

The present study aimed to compare the effectiveness of the Incredible Years Program and the Hanen Parent Training Program on caregiver burden among mothers of children with autism spectrum disorder. This study was a quasi-experimental investigation with a pretest–posttest design, a control group, and a follow-up phase. The statistical population consisted of all mothers of children with autism spectrum disorder who referred to the Autism Center in Gorgan. The sample size was calculated using G*Power software based on statistical power (0.80), effect size (50%), and confidence level (0.05), resulting in 15 participants per group; considering the three groups, a total of 45 participants were selected. Sampling was conducted purposively at the participant-selection stage and non-randomly at the assignment stage for the experimental and control groups. The data collection instrument was the Zarit Caregiver Burden Interview. The pretest and posttest data of the study groups were analyzed using SPSS software version 24 through two-way repeated-measures analysis of variance. It is evident that research conducted in any field has a specific purpose and motivation; however, what appears to be important is the outcomes derived from it, which may have practical applications. The obtained results and recommendations are important not only in terms of applying research findings but also in creating and strengthening motivation among researchers and paving the way for subsequent studies and investigations. Taking the above into account, the following section discusses and concludes the research topic and ultimately presents recommendations for researchers who intend to work in this area.

Keywords: Incredible Years Program, Hanen Parent Training Program, caregiver burden, autism spectrum disorder

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Introduction

Autism spectrum disorder (ASD) is a neurodevelopmental condition characterized by persistent difficulties in social communication and social interaction, along with restricted, repetitive, or inflexible patterns of behavior, interests, and activities. Although ASD is diagnosed in the child, its developmental, emotional, behavioral, and social consequences extend to the family system, particularly to parents who assume the main responsibility for daily care, supervision, communication support, behavioral management, educational follow-up, and coordination with therapeutic services. In many families, mothers are the

primary caregivers and are therefore exposed to continuous caregiving demands that may exceed ordinary parenting responsibilities. These demands are not limited to practical tasks; rather, they include emotional vigilance, long-term uncertainty, social restrictions, financial pressures, and concerns about the child's future independence. For this reason, ASD has increasingly been examined not only as a child-centered developmental condition but also as a family-centered challenge requiring interventions that support both child functioning and parental well-being (1-3).

Caregiver burden refers to the multidimensional strain experienced by family members who provide long-term care for a person with chronic developmental, psychological, or medical needs. In the context of ASD, caregiver burden may include subjective distress, emotional exhaustion, restrictions in social life, reduced quality of life, perceived isolation, hopelessness, and disruption in family routines. Studies have shown that parents of children with ASD experience higher levels of parenting stress than parents of typically developing children and, in many cases, higher stress than parents of children with other developmental disabilities (1, 2). The intensity of caregiver burden can be influenced by the child's behavioral problems, communication limitations, sleep disturbances, rigidity, sensory sensitivities, and dependence on structured routines. At the same time, parental psychological resources, perceived competence, resilience, and access to social support can buffer the negative effects of caregiving demands (3, 4). Therefore, caregiver burden in mothers of children with ASD should be understood as an interaction between child-related needs, family resources, parental cognitions, social context, and the availability of effective support programs.

The caregiving experience in ASD may be further intensified by psychological distress and maladaptive cognitive-emotional processes. Recent evidence has highlighted the mediating role of rumination and hopelessness in the relationship between caregiver burden and psychological distress among parents of children with neurodevelopmental disorders, suggesting that parental burden is not merely a consequence of external demands but is also shaped by internal cognitive and emotional processes (5). In addition, broader caregiving research has shown that burden may undermine quality of life and that internalized stigma can function as a pathway through which caregiving difficulties affect family well-being (6). In families affected by ASD, parents may also experience affiliate stigma, social judgment, and internalized negative beliefs, especially when the child's behavior is misunderstood by others in public settings. Such stigma may reduce help-seeking, increase self-blame, and intensify parental isolation (7-9). The psychological implications of stigma are also consistent with broader models of self-stigma, according to which internalized negative stereotypes can weaken motivation, diminish life goals, and reduce engagement with evidence-based support (10).

Maternal caregiver burden is also closely related to parental self-efficacy and parenting cognitions. Mothers who feel more capable of understanding and responding to their child's needs may experience lower levels of distress, whereas mothers who perceive themselves as ineffective may be more vulnerable to helplessness and emotional exhaustion. Maternal self-efficacy has been identified as an important construct in understanding the adjustment of mothers of children with ASD, because it influences how mothers interpret challenging behaviors, regulate their own responses, and sustain engagement in therapeutic activities (11). Individual beliefs may also shape the caregiving experience; for example, belief in a just world has been discussed as an important individual-difference variable influencing how people interpret adversity, fairness, responsibility, and life events (12). In the context of ASD caregiving, such cognitive

frameworks may affect whether mothers interpret caregiving difficulties as manageable challenges, unjust burdens, or personal failures. Accordingly, interventions that enhance parental competence, provide structured strategies, and strengthen adaptive interpretations may contribute to reducing caregiver burden.

The importance of early and parent-mediated intervention in ASD has been emphasized extensively. Because parents interact with their children across natural daily routines, parent-mediated programs can extend intervention opportunities beyond clinical settings and embed learning within ordinary parent–child interactions. Early intervention studies have demonstrated that developmental gains can be achieved when interventions target communication, social engagement, adaptive behavior, and parent responsiveness (13, 14). Systematic reviews have also supported the role of parent-implemented and parent-mediated interventions for young children with ASD, while noting variability in outcomes, intervention models, intensity, and methodological quality (15-17). Long-term follow-up evidence has further suggested that parent-mediated interventions may produce sustained benefits, particularly when programs improve the quality of parent–child interaction and support parental responsiveness rather than focusing only on child symptoms (18). Therefore, interventions directed at parents are clinically meaningful not only because they may improve child outcomes, but also because they may reduce parental strain through skill acquisition, predictability, and increased perceived control.

Parent training has become one of the most widely recommended psychosocial approaches for families of children with ASD. It is based on the assumption that parents can be trained to recognize antecedents and consequences of behavior, reinforce adaptive responses, improve communication opportunities, and manage challenging behaviors in developmentally appropriate ways. Meta-analytic and systematic review evidence indicates that parent training can reduce disruptive behaviors and improve family functioning among children with ASD, although treatment effects may differ according to program content, parental involvement, child characteristics, and implementation context (19, 20). Randomized trials of parenting programs for children with ASD or developmental difficulties have shown that structured parent training can reduce parenting stress and improve child behavioral outcomes (21, 22). Evidence from transported and culturally adapted parenting programs further highlights that intervention effectiveness depends on the fit between program content and the sociocultural context in which the intervention is delivered (23). This issue is especially relevant in settings where access to specialized ASD services may be limited and where parent training must be feasible, acceptable, and responsive to family needs (24).

Among structured parent-based interventions, the Incredible Years Program has received considerable attention. The program was originally developed as a comprehensive parent, teacher, and child training series to promote positive parenting, strengthen parent–child relationships, increase parental use of praise and reinforcement, reduce harsh or inconsistent discipline, and improve child social, emotional, and behavioral functioning (25). The theoretical foundation of the program is grounded in social learning principles, modeling, reinforcement, emotional coaching, problem-solving, and the promotion of warm and consistent parenting practices. The Incredible Years parent program has also been presented as a multifaceted evidence-based intervention for young children with conduct problems, emphasizing the importance of parent management skills, positive attention, clear limits, and nonviolent discipline (26). Although the program was not originally designed exclusively for ASD, its components are highly relevant to parents of children with ASD, particularly when mothers experience difficulty managing behavioral

problems, establishing routines, regulating emotional responses, and sustaining constructive interactions with their child.

The application of the Incredible Years Program to families of children with ASD has provided promising evidence. Research on families of children with ASD suggests that the program can improve parenting competence, reduce parenting stress, and support more effective management of child behavior (27). Pilot findings have also indicated that Incredible Years parent training may be beneficial for children with ASD and their families by targeting disruptive behaviors and supporting parental strategies (28). These findings are important because many mothers of children with ASD report that behavioral challenges and difficulties in daily routines are among the most burdensome aspects of caregiving. By helping mothers use praise, reinforcement, clear instructions, predictable rules, appropriate consequences, problem-solving strategies, and emotion regulation skills, the Incredible Years Program may reduce caregiver burden through both behavioral and psychological pathways. In other words, as mothers acquire more effective strategies, child-related difficulties may become more manageable, and mothers may experience greater self-efficacy, reduced helplessness, and lower emotional burden.

Another important parent-mediated approach is the Hanen Parent Training Program, particularly the More Than Words model, which is designed for parents of young children with ASD and social communication difficulties. Hanen-based interventions emphasize responsive interaction, following the child's lead, recognizing communication stages, increasing opportunities for joint engagement, using naturalistic strategies, and supporting communication during everyday routines. Studies of Hanen parent programs have shown that they can improve parent–child interaction patterns among toddlers with developmental delays by increasing parental responsiveness and facilitating more effective communicative exchanges (29). A randomized controlled trial of Hanen's More Than Words intervention for parents of toddlers with ASD reported clinically relevant changes in parent and child communication outcomes, although effects may vary by child characteristics and baseline profiles (30). The theoretical and practical significance of the Hanen approach lies in its emphasis on empowering parents to become responsive communication partners rather than passive recipients of professional recommendations.

The Hanen Parent Training Program is especially relevant for mothers of children with ASD because communication difficulties are central to the disorder and often contribute substantially to parental stress. When children have limited expressive language, reduced joint attention, atypical play, or difficulty initiating and maintaining interaction, mothers may experience frustration, uncertainty, and emotional disconnection. Parent-mediated communication-focused interventions, such as PACT and related models, have shown that changing parental responsiveness and interaction style can influence child communication and social engagement (31). Similarly, early intervention programs comparing center-based and home-based models have emphasized the value of parent involvement and naturalistic learning opportunities in improving outcomes for young children with ASD (32). By teaching mothers to observe the child's signals, follow the child's interests, use visual supports, simplify language, encourage turn-taking, and create communicative opportunities during play and daily routines, the Hanen program may reduce the uncertainty and helplessness that contribute to caregiver burden.

Despite the growing evidence base for parent-mediated interventions, several issues remain important. First, many studies have focused primarily on child outcomes, whereas parental outcomes such as caregiver

burden, emotional exhaustion, isolation, and hopelessness require more direct investigation. Second, the majority of intervention studies have evaluated single programs rather than comparing two active parent-training approaches with different emphases. Third, while the Incredible Years Program focuses strongly on positive parenting, behavior management, discipline, praise, reinforcement, problem-solving, and emotional self-regulation, the Hanen Parent Training Program focuses more specifically on communication, interaction, following the child's lead, play, visual supports, and social engagement. These differences suggest that the two programs may reduce caregiver burden through partially distinct mechanisms. For example, the Incredible Years Program may be more directly related to reducing burden associated with behavioral management, whereas the Hanen program may reduce burden by improving communicative reciprocity and parent–child connection. General parenting literature also suggests that parent training must be responsive to the nature of the parenting challenge, whether the difficulty concerns behavioral regulation, developmental needs, or family interaction patterns (33, 34).

The developmental period of early childhood is particularly important for parent-based intervention in ASD. Mothers of children aged 2 to 6 years often face simultaneous challenges related to diagnosis, adaptation to the child's needs, initiation of therapeutic services, family adjustment, and decisions about education and rehabilitation. At this stage, the child's developmental trajectory may be highly responsive to structured environmental input, and mothers may be especially motivated to learn practical strategies. However, this period can also be emotionally demanding because parents must manage uncertainty about prognosis while coping with immediate behavioral and communication difficulties. Studies of adult children with autism have shown that caregiver burden can persist across the life course, indicating that early support for parents may have long-term significance for family adaptation (35). Therefore, reducing caregiver burden during early childhood is not only an immediate psychological goal but also a preventive strategy that may protect family functioning and maternal well-being over time.

In societies where specialized ASD services are still developing or where access to intensive professional intervention may be constrained, structured parent-training programs can be particularly valuable. Parent training is relatively feasible, can be delivered in group formats, and may increase the reach of intervention by equipping mothers with skills that can be used at home. Nevertheless, the effectiveness of these programs must be evaluated empirically within specific cultural and service contexts, because parental beliefs, stigma, family roles, expectations of motherhood, and service accessibility may influence both engagement and outcomes. Feasibility studies and reviews of parent training in low- and middle-income contexts have emphasized the importance of accessible, culturally acceptable, and scalable interventions for ASD (24). Furthermore, comparing different programs within the same study can help clinicians and service providers identify which intervention may be more suitable when the primary therapeutic target is caregiver burden rather than only child communication or behavior.

Accordingly, the present study aimed to compare the effectiveness of the Incredible Years Program and the Hanen Parent Training Program on caregiver burden among mothers of children with autism spectrum disorder.

Methods and Materials

Study Design and Participants

The present study was conducted to determine and compare the effectiveness of two parent-based intervention programs, namely the Incredible Years Program and the Hanen Parent Training Program, on caregiver burden among mothers of children with autism spectrum disorder. Given the intervention-based nature of the study and the need to compare the outcomes of mothers receiving the interventions with those of a control group, the research design was quasi-experimental. The study employed a pretest–posttest design with a control group and a follow-up phase. The statistical population consisted of all mothers of children diagnosed with autism spectrum disorder who referred to autism centers in Gorgan. The diagnosis of autism spectrum disorder had previously been made by psychiatrists and psychologists, and the children's clinical records were reviewed before participant recruitment. The sample size was calculated using G*Power software based on a statistical power of 0.80, an effect size of 0.50, and a significance level of 0.05. Accordingly, 15 participants were estimated for each group, and considering the three study groups, a total of 45 mothers were selected. Sampling was conducted purposively at the participant-selection stage, and assignment to the two experimental groups and the control group was performed non-randomly. The first experimental group consisted of mothers who received the Incredible Years Program, the second experimental group consisted of mothers who received the Hanen Parent Training Program, and the control group did not receive any intervention during the main phase of the study. The inclusion criteria were being a mother with at least a high school diploma, having a child aged 2 to 6 years diagnosed with autism spectrum disorder ranging from mild to severe, not participating in any concurrent psychotherapeutic or parent-training intervention during the study, and providing informed consent to participate. The exclusion criteria included absence from more than two intervention sessions, failure to respond to more than 20% of the questionnaire items, and simultaneous participation in other psychotherapeutic interventions. Before the implementation of the interventions, informed consent was obtained from all participating mothers. They were assured that no psychological or physical harm would be imposed on them or their children, that their personal information would remain confidential, and that they had the right to withdraw from the study at any time for any reason or without providing a reason. After completion of the study, the control group was also offered an educational program similar to that provided to the experimental groups in order to benefit from the potential positive effects of the intervention.

Data Collection

The Zarit Caregiver Burden Interview was used to assess caregiver burden. This instrument was developed by Zarit and colleagues in 1980 to measure the level of psychological burden experienced by caregivers of patients. The questionnaire consists of 22 items and is commonly administered to family caregivers in an interview format. Each item is scored on a five-point Likert scale ranging from 0 to 4, with response options including never, rarely, sometimes, often, and always. The total score represents the caregiver's level of burden, with higher scores indicating greater psychological and caregiving burden. The questionnaire includes five subscales: general burden, consisting of eight items; isolation, consisting of three items; disappointment or hopelessness, consisting of five items; emotional involvement, consisting of three items;

and environmental burden, consisting of three items. The possible total score ranges from 0 to 88. Scores between 61 and 88 indicate severe caregiver burden, scores between 31 and 60 indicate moderate caregiver burden, and scores below 30 indicate mild caregiver burden. The reliability of the original version was reported as 0.71 using the test–retest method, and its internal consistency was reported as 0.91 based on Cronbach's alpha.

Intervention

The Incredible Years Program was implemented for the first experimental group in 12 face-to-face sessions, each lasting approximately 60 to 90 minutes. The sessions were delivered by the researcher with the assistance of a co-therapist, based on the training and supervision received from the academic advisors and consultants. At the beginning of the program, participants were introduced to the rationale, goals, and assigned responsibilities of the intervention and were guided to reflect on why they were participating in the program. The second session focused on helping mothers understand the developmental and behavioral characteristics of their children, the distinction between parental needs and the needs of children with developmental disabilities, and the importance of adjusting parental expectations to the child's developmental level. The third session addressed assertiveness in parenting and introduced different parenting styles, with particular emphasis on distinguishing authoritarian parenting from firm and constructive assertiveness. The fourth session focused on parent–child play, assigning developmentally appropriate responsibilities to the child, and increasing positive interaction through play. The fifth and sixth sessions emphasized the appropriate use of encouragement, praise, rewards, and reinforcers, including the correct and timely application of reinforcement strategies to strengthen desirable child behaviors. The seventh session focused on implementing household rules by presenting rules in clear, understandable, and consistent ways. The eighth session addressed discipline and corrective strategies, emphasizing appropriate disciplinary methods and the importance of using them constructively rather than punitively. The ninth session focused on improving child adjustment by reinforcing clear rules, consistency, and predictable parental responses. The tenth session was devoted to enhancing problem-solving behaviors in the child by modeling parental problem-solving skills, identifying problems, and examining possible solutions. The eleventh session focused on parental self-regulation, including the management of distressing thoughts, recognition of possible emotional reactions in parents, control of emotional responses, and strategies for remaining outside escalating tension. The twelfth session addressed the development of parental communication skills, including active listening, expression of emotions, appropriate interaction with others, and constructive management of problems between spouses. At the end of each session, mothers were assigned homework related to the session content, and at the beginning of the next session, their homework was reviewed and constructive feedback was provided.

The Hanen Parent Training Program was implemented for the second experimental group in nine face-to-face sessions, each lasting approximately 60 to 90 minutes. The sessions were conducted by the researcher and a co-therapist under academic guidance and supervision. The first session focused on the characteristics of children with autism spectrum disorder, including sensory features, different learning styles, causes of restricted and stereotyped behaviors, and the importance of attending to the child's interests and preferences. The second session addressed the child's communication style and introduced the different

communication stages of children with autism spectrum disorder, the characteristics of each stage, the need to establish realistic communication goals, and the importance of attending to both verbal and nonverbal signals. The third session focused on following the child's lead and taught mothers how to join the child's activities through observation and the use of four core strategies: attending, commenting, imitating, and waiting while listening. Techniques for speaking in a way that was consistent with the child's communicative level were also introduced. The fourth session emphasized doing activities together and included the use of conversational rules, different types of prompts such as explicit, natural, physical, verbal, visual, and gestural prompts, appropriate instructions for speaking, asking suitable questions, and respecting turn-taking. The fifth session focused on playing with the child and selecting appropriate toys based on the child's communicative characteristics. Mothers were introduced to different forms of play, ranging from social games to rule-based games, and were trained to use strategies such as repetition, providing opportunities, prompting, and maintaining interaction, as well as methods for initiating, continuing, and ending play. The sixth session focused on helping the child understand words, actions, and emotional experiences through strategies such as speaking less, emphasizing key words, slowing down, showing rather than only telling, using words and sentences appropriate to the child's communication stage, using suitable objects and materials to facilitate comprehension, breaking down and combining words and sentences, and supporting the child's understanding of their own emotions and those of others. The seventh session was devoted to visual supports, including the construction of choice boards, daily routine boards, special signs and symbols, visual aids for understanding past and future events, personal stories, and personal videos. The eighth session focused on shared book reading with the child, including the use of wordless picture books, selecting books appropriate to the child's communication characteristics, preparing interactive books, adapting book text to the child's learning style, narrating stories in a simple and brief manner, preparing individualized books, and using suitable labels. The ninth session addressed friendship skills, including selecting appropriate peers, determining suitable times for play in both structured and unstructured contexts, using toys during play with other children, teaching playmates to understand the child's characteristics, and helping the child learn how to initiate, continue, and end conversations for the purpose of friendship formation. Mothers were also trained to help their children remain engaged in play and avoid leaving the interaction prematurely. As in the Incredible Years group, homework assignments related to each session were given to participants, reviewed at the beginning of the following session, and accompanied by constructive feedback.

Data Analysis

Data analysis was conducted using SPSS software version 24. Descriptive statistics, including mean and standard deviation, were used to summarize participants' caregiver burden scores across the study groups and measurement stages. Before conducting inferential analyses, the relevant statistical assumptions were examined, including the normality of the distribution of scores, homogeneity of variances, and the assumptions required for repeated-measures analysis. To compare changes in caregiver burden across time and between groups, a two-way repeated-measures analysis of variance was performed. In this analysis, time was considered the within-subject factor, and group membership, including the Incredible Years intervention group, the Hanen Parent Training intervention group, and the control group, was considered

the between-subject factor. The main effects of time and group, as well as the interaction effect of time by group, were examined to determine whether changes in caregiver burden differed significantly among the three groups. When statistically significant effects were observed, appropriate post hoc comparisons were used to identify the pattern of differences between groups and measurement stages. The significance level for all inferential analyses was set at 0.05.

Findings and Results

The participants were equally distributed across the three study groups. Specifically, 15 mothers (33.33%) were assigned to the control group, 15 mothers (33.33%) to the experimental group receiving the Incredible Years Program, and 15 mothers (33.33%) to the experimental group receiving the Hanen Parent Training Program. Regarding age, 12 participants (26.70%) were younger than 30 years, 18 participants (40.00%) were between 30 and 40 years, and 15 participants (33.30%) were older than 40 years. Table 1 presents the descriptive statistics, including means and standard deviations, for caregiver burden and its components across the three groups and three measurement phases.

Table 1. Descriptive Statistics for Caregiver Burden and Its Components by Group and Measurement Phase

Variable	Group	Pretest M	Pretest SD	Posttest M	Posttest SD	Follow-up M	Follow-up SD
Caregiver burden	Control	62.60	7.50	62.60	7.26	62.93	6.87
Caregiver burden	Incredible Years Program	63.26	6.89	48.80	6.63	53.80	6.78
Caregiver burden	Hanen Parent Training Program	62.13	6.82	53.53	6.50	57.80	6.44
General burden	Control	20.40	2.94	20.13	3.11	20.66	2.89
General burden	Incredible Years Program	20.73	3.07	17.66	3.03	18.73	3.05
General burden	Hanen Parent Training Program	20.20	2.80	18.40	2.82	19.26	2.76
Loneliness	Control	9.73	1.48	9.53	1.24	9.93	1.27
Loneliness	Incredible Years Program	9.93	1.27	7.33	1.04	8.26	1.16
Loneliness	Hanen Parent Training Program	9.60	1.29	8.40	1.18	9.00	1.06
Hopelessness	Control	14.26	2.46	14.60	2.16	14.06	2.21
Hopelessness	Incredible Years Program	14.40	2.29	11.33	2.38	12.33	2.41
Hopelessness	Hanen Parent Training Program	14.06	2.25	12.26	2.15	13.06	2.08
Emotional involvement	Control	9.73	1.43	10.00	1.13	9.60	1.24
Emotional involvement	Incredible Years Program	9.60	1.24	6.73	1.22	7.73	1.25
Emotional involvement	Hanen Parent Training Program	9.93	1.27	7.80	1.32	9.00	1.30
Environmental involvement	Control	8.46	1.40	8.33	1.44	8.66	1.39
Environmental involvement	Incredible Years Program	8.60	1.24	5.73	1.43	6.73	1.45
Environmental involvement	Hanen Parent Training Program	8.33	1.34	6.66	1.34	7.46	1.35

As shown in Table 1, the mean scores of caregiver burden and its components were relatively similar across the three groups at the pretest stage. In the control group, caregiver burden remained almost unchanged from pretest to posttest and follow-up. However, in both experimental groups, caregiver burden decreased

after the intervention. The reduction was more pronounced in the Incredible Years Program group, where the mean caregiver burden score decreased from 63.26 at pretest to 48.80 at posttest and then increased slightly to 53.80 at follow-up. In the Hanen Parent Training Program group, the mean caregiver burden score decreased from 62.13 at pretest to 53.53 at posttest and then increased to 57.80 at follow-up. A similar pattern was observed for the components of caregiver burden, including general burden, loneliness, hopelessness, emotional involvement, and environmental involvement. These descriptive findings suggest that both interventions were associated with reductions in caregiver burden, although the magnitude of reduction appeared greater in the Incredible Years Program group.

Before conducting the repeated-measures analysis of variance, the assumptions required for this statistical test were examined. The distribution of the study variables was assessed for normality, and the assumptions of homogeneity of variances and equality of covariance structures were considered. The preliminary assumption testing indicated that the data were suitable for repeated-measures analysis of variance. Therefore, a repeated-measures ANOVA was used to examine the main effect of time, the main effect of group, and the interaction effect of time by group for caregiver burden and its components across the pretest, posttest, and follow-up stages.

Table 2. Repeated-Measures Analysis of Variance for Caregiver Burden and Its Components

Variable	Source of Variation	SS	df	MS	F	p	η^2
Caregiver burden	Time	1342.637	2	671.319	939.846	< .001	.957
Caregiver burden	Group	1281.126	2	640.563	14.567	< .001	.379
Caregiver burden	Time × Group	832.696	4	208.174	291.444	< .001	.933
General burden	Time	65.911	2	32.956	171.115	< .001	.803
General burden	Group	49.978	2	23.489	12.086	< .001	.224
General burden	Time × Group	33.244	4	8.311	43.154	< .001	.673
Loneliness	Time	40.015	2	20.007	140.572	< .001	.770
Loneliness	Group	34.059	2	17.030	10.973	< .001	.206
Loneliness	Time × Group	24.030	4	6.007	42.208	< .001	.668
Hopelessness	Time	54.711	2	27.356	171.767	< .001	.804
Hopelessness	Group	63.244	2	31.622	12.091	< .001	.215
Hopelessness	Time × Group	45.244	4	11.311	71.023	< .001	.772
Emotional involvement	Time	57.081	2	28.541	315.450	< .001	.883
Emotional involvement	Group	69.348	2	34.674	14.440	< .001	.262
Emotional involvement	Time × Group	41.985	4	10.496	116.012	< .001	.847
Environmental involvement	Time	54.578	2	27.289	307.000	< .001	.880
Environmental involvement	Group	50.533	2	25.267	13.558	< .001	.258
Environmental involvement	Time × Group	30.622	4	7.656	86.125	< .001	.804

As presented in Table 2, the main effect of time was statistically significant for caregiver burden, $F(2) = 939.846$, $p < .001$, $\eta^2 = .957$, indicating that caregiver burden scores differed significantly across the pretest, posttest, and follow-up stages. The main effect of group was also significant, $F(2) = 14.567$, $p < .001$, $\eta^2 = .379$, showing that the three groups differed significantly in caregiver burden scores. In addition, the interaction effect of time by group was statistically significant, $F(4) = 291.444$, $p < .001$, $\eta^2 = .933$, indicating that the pattern of change in caregiver burden over time differed significantly across the control group, the Incredible Years Program group, and the Hanen Parent Training Program group. Similar results were obtained for all components of caregiver burden. The main effects of time and group, as well as the time by group interaction effects, were significant for general burden, loneliness, hopelessness, emotional

involvement, and environmental involvement. These findings demonstrate that both intervention programs produced significant changes in caregiver burden and its components over time, with the strongest changes observed in the experimental groups rather than the control group.

Table 3. Bonferroni Post Hoc Comparisons for Caregiver Burden and Its Components Across Study Groups

Variable	Group Comparison	Mean Difference	p
Caregiver burden	Control vs. Incredible Years Program	7.422	< .001
Caregiver burden	Control vs. Hanen Parent Training Program	4.889	< .001
Caregiver burden	Incredible Years Program vs. Hanen Parent Training Program	-2.533	< .001
General burden	Control vs. Incredible Years Program	3.356	< .001
General burden	Control vs. Hanen Parent Training Program	2.111	< .001
General burden	Incredible Years Program vs. Hanen Parent Training Program	-1.245	< .001
Loneliness	Control vs. Incredible Years Program	1.832	< .001
Loneliness	Control vs. Hanen Parent Training Program	0.730	.023
Loneliness	Incredible Years Program vs. Hanen Parent Training Program	-1.052	< .001
Hopelessness	Control vs. Incredible Years Program	2.301	< .001
Hopelessness	Control vs. Hanen Parent Training Program	1.178	.009
Hopelessness	Incredible Years Program vs. Hanen Parent Training Program	-1.123	.006
Emotional involvement	Control vs. Incredible Years Program	1.756	< .001
Emotional involvement	Control vs. Hanen Parent Training Program	0.867	.018
Emotional involvement	Incredible Years Program vs. Hanen Parent Training Program	-0.889	.013
Environmental involvement	Control vs. Incredible Years Program	2.867	< .001
Environmental involvement	Control vs. Hanen Parent Training Program	1.970	< .001
Environmental involvement	Incredible Years Program vs. Hanen Parent Training Program	-0.897	.010

The Bonferroni post hoc comparisons presented in Table 3 showed that both intervention programs produced statistically significant differences in caregiver burden and all of its components compared with the control group. The control group had higher adjusted mean scores than the Incredible Years Program group and the Hanen Parent Training Program group in caregiver burden, general burden, loneliness, hopelessness, emotional involvement, and environmental involvement. These results indicate that both interventions were effective in reducing caregiver burden among mothers of children with autism spectrum disorder. Moreover, the comparison between the two experimental groups showed that the Incredible Years Program produced significantly greater reductions than the Hanen Parent Training Program. For total caregiver burden, the mean difference between the Incredible Years Program and the Hanen Parent Training Program was -2.533, $p < .001$, indicating a greater reduction in caregiver burden in the Incredible Years Program group. Similar significant differences were observed for general burden, loneliness, hopelessness, emotional involvement, and environmental involvement. Therefore, although both interventions were effective, the Incredible Years Program demonstrated stronger effectiveness in reducing caregiver burden and its components among mothers of children with autism spectrum disorder.

Discussion and Conclusion

The present study aimed to compare the effectiveness of the Incredible Years Program and the Hanen Parent Training Program on caregiver burden among mothers of children with autism spectrum disorder. The findings showed that caregiver burden and all of its components, including general burden, loneliness, hopelessness, emotional involvement, and environmental involvement, changed significantly over time and differed significantly across the study groups. The significant time effect indicated that the scores of

caregiver burden were not stable across the pretest, posttest, and follow-up phases. The significant group effect showed that the control group and the two experimental groups differed in their overall levels of caregiver burden. More importantly, the significant time by group interaction demonstrated that the pattern of change over time was different across the three groups. In other words, the reductions observed in the experimental groups cannot be interpreted merely as a function of repeated measurement or natural fluctuation; rather, they indicate the beneficial effects of the parent-training interventions. The descriptive findings also supported this interpretation, as the control group showed almost no meaningful reduction in caregiver burden, whereas both experimental groups demonstrated clear reductions from pretest to posttest. These findings are consistent with previous evidence showing that parents of children with autism spectrum disorder experience substantial caregiving stress and that structured parent-mediated interventions can reduce parental distress by improving parenting competence, communication patterns, and behavioral management skills (1, 2, 16, 17).

The first major finding was that the Incredible Years Program significantly reduced caregiver burden among mothers of children with autism spectrum disorder. This result is consistent with the theoretical foundation of the program, which emphasizes positive parenting, constructive discipline, reinforcement, praise, problem-solving, parent–child play, emotional regulation, and consistent rule-setting (25, 26). Mothers of children with autism spectrum disorder often face persistent behavioral and emotional challenges, including child rigidity, noncompliance, communication difficulties, emotional dysregulation, and difficulties in daily routines. When mothers do not have an organized behavioral framework for responding to these difficulties, caregiving can become unpredictable, emotionally draining, and associated with feelings of helplessness. The Incredible Years Program appears to reduce this burden by transforming parenting from a reactive and emotionally exhausting process into a more structured, predictable, and skill-based process. This interpretation is supported by previous studies showing that the Incredible Years Program can improve parenting practices and reduce parental stress and child behavior problems (22, 27, 28). The present findings extend these prior results by showing that this program can also reduce caregiver burden and its psychological components among mothers of children with autism spectrum disorder.

The effectiveness of the Incredible Years Program may also be explained by its direct focus on parental self-regulation and emotional management. Caregiver burden is not merely a reflection of the number of caregiving tasks; it is also shaped by the caregiver's interpretation of child behavior, perceived control, self-efficacy, and ability to manage emotional reactions. Previous research has shown that maternal self-efficacy is an important factor in parenting cognitions among mothers of children with autism spectrum disorder (11). When mothers acquire practical strategies for managing difficult behaviors, giving effective instructions, using appropriate reinforcement, and maintaining emotional control, their sense of competence increases. This increase in competence can reduce hopelessness, emotional involvement, and general burden. The findings are also in line with evidence that parental personal and social resources influence parenting stress in mothers of children with autism spectrum disorder (3). Therefore, the reduction in caregiver burden in the Incredible Years group may be attributed to the combined effects of improved parenting skills, increased perceived efficacy, better emotional regulation, and reduced ambiguity in managing the child's behavior.

The second major finding was that the Hanen Parent Training Program also significantly reduced caregiver burden and its components compared with the control group. This finding is consistent with research supporting parent-mediated communication-focused interventions for young children with autism spectrum disorder (15, 18, 31). The Hanen approach is based on improving parent–child communication through strategies such as following the child's lead, observing verbal and nonverbal signals, using responsive interaction, simplifying language, encouraging turn-taking, using visual supports, and creating communication opportunities in natural routines. Communication difficulties are among the central characteristics of autism spectrum disorder and are often experienced by mothers as one of the most stressful aspects of caregiving. When a child has difficulty expressing needs, responding socially, or engaging in reciprocal interaction, the mother may experience frustration, uncertainty, and emotional distance. By helping mothers understand their child's communication stage and adapt their interaction style accordingly, the Hanen program can reduce the sense of confusion and helplessness that contributes to caregiver burden. This explanation is consistent with findings from Hanen-based and communication-oriented interventions showing improvements in parent–child interaction and parental responsiveness (29, 30).

The significant effect of the Hanen program may also be understood in relation to the broader evidence on early parent-mediated interventions in autism spectrum disorder. Parent-mediated interventions are effective because they do not restrict therapeutic learning to clinical sessions; instead, they transfer intervention strategies to everyday parent–child routines, including play, book reading, communication, and daily activities. This allows the parent to become an active agent of change rather than a passive recipient of professional advice. Studies of early intervention programs have shown that involving parents in the intervention process can improve communication and developmental outcomes in children with autism spectrum disorder (13, 14, 32). Although the present study focused on maternal caregiver burden rather than child developmental outcomes, improvements in parent–child communication and interaction may indirectly reduce maternal burden. When mothers can understand the child's signals more accurately, elicit more engagement, and use visual and verbal supports effectively, daily care becomes less conflictual and more predictable. This can reduce loneliness, hopelessness, emotional involvement, and environmental strain.

Another important finding was that the Incredible Years Program produced stronger reductions in caregiver burden than the Hanen Parent Training Program. The Bonferroni comparisons showed that both interventions were superior to the control condition, but the Incredible Years Program was more effective than the Hanen program in reducing total caregiver burden and all of its components. This comparative finding may be explained by the broader behavioral and emotional scope of the Incredible Years Program. Whereas the Hanen program primarily targets communication, interaction, play, and social engagement, the Incredible Years Program directly addresses behavior management, discipline, problem-solving, emotional self-control, household rules, reinforcement, and parent–child relationship quality. Caregiver burden among mothers of children with autism spectrum disorder is often strongly influenced by disruptive behavior, difficulty managing routines, social limitations, and the emotional exhaustion resulting from repeated behavioral challenges (19, 20). Therefore, a program with a broader behavioral management component may have a stronger effect on perceived burden. This interpretation is consistent with evidence that parent

training programs targeting disruptive behavior in autism spectrum disorder can reduce child behavior problems and improve family functioning (19, 21).

The greater effectiveness of the Incredible Years Program may also reflect its emphasis on the mother's own coping and interpersonal functioning. In the present protocol, the program included sessions on parental self-control, management of distressing thoughts, emotional reactions, active listening, expression of feelings, communication with others, and constructive management of marital or family difficulties. These components are directly related to caregiver burden because burden is not only caused by the child's needs but also by the caregiver's emotional resources, interpersonal support, and ability to regulate stress. Previous studies have shown that resilience plays a protective role in the relationship between stress and quality of life among parents of children with autism spectrum disorder (4). Other evidence suggests that caregiver burden may be intensified by psychological distress, rumination, hopelessness, and internalized stigma (5, 6). Therefore, by addressing emotional self-management and problem-solving, the Incredible Years Program may have influenced not only practical parenting behaviors but also the psychological mechanisms through which caregiving demands become burdensome.

The findings also showed that although caregiver burden decreased from pretest to posttest in both experimental groups, some increase was observed at follow-up. This pattern suggests that the intervention effects were maintained to a meaningful extent but may have weakened slightly after the completion of structured sessions. Such a pattern is not unexpected in parent-training studies, particularly when families continue to face chronic developmental and behavioral demands after the intervention ends. Long-term studies of parent-mediated interventions have shown that outcomes may vary across time and that continued practice, booster sessions, and environmental support may be necessary to sustain gains (18). In the context of autism spectrum disorder, caregiver burden is shaped by ongoing child needs, social stigma, service limitations, and family resources. Therefore, a short-term intervention may reduce burden, but without continued support, some distress may re-emerge. This interpretation is consistent with evidence that caregiving burden can persist across the life course in families of individuals with autism spectrum disorder (35). Thus, the follow-up pattern observed in this study highlights the importance of maintenance strategies after parent training.

The reduction in the components of caregiver burden is also noteworthy. General burden, loneliness, hopelessness, emotional involvement, and environmental involvement all decreased significantly in the intervention groups. This multidimensional improvement suggests that the interventions did not merely reduce a single behavioral difficulty but influenced broader aspects of maternal caregiving experience. Reductions in loneliness may be related to the group-based and supportive nature of the programs, where mothers were able to share experiences, normalize their difficulties, and feel less isolated. Reductions in hopelessness may be explained by the acquisition of practical skills and the development of more realistic expectations about the child's communication and behavior. Reductions in emotional involvement may reflect improved parental self-regulation, while reductions in environmental involvement may be associated with better management of daily routines and child-related demands. These results align with previous findings indicating that parental stress in autism spectrum disorder is multidimensional and influenced by child characteristics, parental resources, social support, stigma, and coping processes (3, 7-9).

The present findings are also consistent with the broader literature on the transportability and contextual adaptation of parenting interventions. Parent-training programs may be developed in one cultural context but implemented in another, and their effectiveness depends on how well the program content matches family needs, parental beliefs, and service conditions. Evidence suggests that transported parenting interventions can be effective, although contextual sensitivity is essential for successful implementation (23). This is particularly relevant for families of children with autism spectrum disorder in settings where specialized services may be limited, fragmented, or difficult to access. Systematic reviews of parent training in low- and middle-income countries have emphasized that parent-mediated programs may be feasible and beneficial when they are accessible, structured, and adapted to local service realities (24). The findings of the present study support the value of such programs for mothers of children with autism spectrum disorder and suggest that structured parent education can be used as a practical intervention to reduce psychological and caregiving burden.

Finally, the findings can be interpreted in relation to the role of social meaning and stigma in maternal caregiving. Mothers of children with autism spectrum disorder may experience public judgment, misunderstanding, and blame when their child displays atypical behavior. Such experiences may increase affiliate stigma and internalized shame, which can intensify caregiver burden and reduce willingness to seek help (7, 8). Broader stigma theory suggests that self-stigma can weaken motivation, reduce life goals, and interfere with engagement in evidence-based support (10). Parent-training programs may reduce these negative processes by providing mothers with knowledge, skills, and a more accurate understanding of their child's condition. Moreover, when mothers participate in a structured intervention with other parents facing similar challenges, they may reinterpret their caregiving experience less as a personal failure and more as a manageable developmental and family challenge. This shift may be especially important for reducing hopelessness and loneliness. Individual beliefs, including beliefs about fairness, responsibility, and control, may also influence how mothers interpret the caregiving experience (12). Therefore, the observed reductions in caregiver burden may reflect both practical skill development and changes in mothers' psychological meaning-making.

This study had several limitations that should be considered when interpreting the findings. First, the sample size was relatively small and consisted of mothers of children with autism spectrum disorder who referred to autism centers in Gorgan; therefore, the generalizability of the results to fathers, other caregivers, families from other regions, and parents of children with different developmental profiles should be made with caution. Second, participants were selected purposively and assigned to groups non-randomly, which may limit causal inference and increase the possibility of selection bias. Third, caregiver burden was measured using a self-report questionnaire, and responses may have been influenced by social desirability, emotional state, or participants' expectations from the intervention. Fourth, although a follow-up phase was included, the duration of follow-up was limited, and longer-term maintenance of intervention effects could not be fully evaluated. Fifth, the study did not directly assess changes in child behavior, communication, or adaptive functioning, which could have clarified the mechanisms through which maternal caregiver burden decreased.

Future studies are recommended to replicate this research with larger samples and randomized controlled designs to strengthen causal interpretation and increase the generalizability of the findings. It is also

suggested that future research include fathers, grandparents, and other primary caregivers in order to examine whether the effects of the Incredible Years Program and the Hanen Parent Training Program differ across caregiver roles. Future studies should use longer follow-up periods to determine whether reductions in caregiver burden are sustained over time and whether booster sessions are needed to maintain treatment gains. Researchers are also encouraged to include child-related outcomes, such as communication skills, behavioral problems, emotional regulation, adaptive functioning, and social engagement, in order to identify the pathways through which parent-training programs reduce caregiver burden. In addition, future studies may examine mediating variables such as parental self-efficacy, resilience, perceived social support, stigma, coping strategies, and emotional regulation to provide a more precise explanation of intervention mechanisms.

The findings of this study suggest that structured parent-training programs can be useful components of services for families of children with autism spectrum disorder. Clinicians, psychologists, counselors, speech-language therapists, and rehabilitation professionals should consider incorporating parent-focused interventions into autism service plans, especially for mothers who experience high levels of caregiver burden. The Incredible Years Program may be particularly useful when the main concerns include child behavior management, family routines, parental emotional exhaustion, and difficulties in discipline or rule-setting. The Hanen Parent Training Program may be especially helpful when the primary concerns involve communication, interaction, play, turn-taking, and social engagement. Service providers should also consider combining behavioral-management and communication-focused elements to design comprehensive programs that address both child-related and parent-related needs. Finally, parent-training programs should include homework, feedback, emotional support, and follow-up or booster sessions so that mothers can maintain the skills learned during the intervention and apply them consistently in daily life.

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Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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