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# Perceived parental differential treatment, cognition, behaviour and family cohesiveness among siblings of children with cerebral palsy? A family-mediated intervention to understand “displaced” children

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**Abstract:** The present study adopts a quasi-experimental design to evaluate the impact of perceived parental differential treatment towards 30 non-disabled siblings of children with cerebral palsy 7–10 years of age. Standardised inventories such as, the Stanford-Binet Intelligence Test (SBIT), the Connors Parent Rating Scale-Revised (CPRS) and the Draw-a-Family test were used pre and post intervention. Scheduled interviews were used for parents and children to obtain information regarding family cohesiveness. A special program was designed to structure the home environment and to maximise parental involvement that catered to the “needy child” and this was implemented for 6 months after which the children were reassessed. Prior to the intervention, we observed deficits in cognitive skills and siblings had concerns in hyperactivity and oppositional behaviour. Scheduled interviews with siblings elicited responses that represented neglect, perceived differential treatment and negative emotional well-being. Projective tests revealed that family dynamics were disturbed and chaotic. Post intervention, we observed significant differences in the cognitive orientation, behavioural engagement and also in the interpersonal relationship within the family. We may conclude therefore, that parental involvement significantly predicts academic and psychosocial adjustment of siblings and this is an important implication for practitioners in developing early intervention programs.

**Keywords:** cerebral palsy; familial involvement; hyperactivity; intelligence; interpersonal relationship.

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## Introduction

Cerebral palsy (CP) is a broad diagnostic term used to describe a problem with movement and posture that makes certain activities difficult. Cerebral palsy can be the result of an injury to the brain during gestation or in the first year of life, or it occurs when the brain does not develop properly during gestation [1]. Simply stated, “cerebral” refers to the brain, and “palsy” refers to muscle weakness and poor control. There is currently no cure for cerebral palsy; however, there are different treatment options for people who have cerebral palsy [2]. These options include therapy, medications, surgery, education and support. By taking advantage of these treatments, people with CP can improve their function, minimise the development of complicating issues and optimise the quality of their lives.

Siblings provide the most long-lasting relationships for adults with developmental disabilities [3]. Over 30 years of research on siblings has provided key information about the effects of being a brother or sister of an individual with a disability. The research results are mixed, with some noting more behaviour problems and depression and others failing to find such differences or finding positive impacts [4]. Siblings who have brothers or sisters with mental health conditions, with autism, or with other severe behaviour problems associated with their disability are more likely to report problems in the early relationship and to exhibit symptoms of depression or less positive adjustment in later life [5]. Family subsystems (e.g. parent-child relationships, sibling relationships) are not independent entities but are interconnected and simultaneously affect an individual family member [6]. This implies that the effects of parent-child interactions may be moderated by the interactions or relationships that child has with other family members, such as a sibling. Social comparison processes not only operate outside families, but may be particularly strong between

siblings within the same family, especially in terms of parental treatment [7]. The effects of comparing one's own parental treatment with that of a sibling's may be dependent on the quality of the relationship that exists between the siblings. In fact, it is believed that siblings respond differently to circumstances similar to those raised in non-shared environments [8]. One important family factor that may contribute to this dissimilarity is differential parental treatment. Differential parental treatment refers to the fact that children within the same family are treated differently by their parents or may perceive their treatment differently [9]. Various studies have revealed that differential parental treatment is related to children's and adolescents' externalising problems, such as antisocial behaviour [10]. The general conclusion from these studies is that those siblings who are treated less favourably show lower levels of adjustment. However, previous research has focused primarily on the direct association between differential parental treatment and broad measures of externalising problem behaviour, and has relatively neglected the possible role of moderators. Therefore, the aim of the present study was to examine whether non-disabled siblings of children affected with CP experience maladjustment in behaviour, academic performance and difficulty in adaptation within the family due to perceiving differential treatment.

## Materials and methods

### Setting

The present study was conducted in the developmental paediatrics department in the Christian Medical College and Hospital (CMCH), Vellore. Thirty non-disabled siblings between the ages of 7–10 years (84–120 months) were recruited for the study. The siblings of these children had been clinically diagnosed to have cerebral palsy with no other co-morbid conditions. Most of them had motor dysfunctions accompanied by mental retardation and were on regular visits to the out patient services of the clinic. The non-disabled siblings were randomly chosen from a source list in the department and after obtaining informed consent, both siblings and parents agreed to participate in the study. All standardised tests were administered in the clinic itself. Children underwent a baseline assessment after which they were provided with an intervention for 6 months following which they were reassessed.

### Participants

The sample consisted of 30 non-disabled siblings between the ages of 7–10 years of children diagnosed to have cerebral palsy children ( $M=94.20$ ,  $SD=7.79$ ) who visited the out patient services of the

developmental paediatrics department in CMC Hospital regularly for therapy. Siblings were recruited randomly for the study from a source list in the clinic. Siblings of children diagnosed to have cerebral palsy had concerns in cognitive skills, behaviour and also psychosocial adjustment within the family. Parents reported of difficulties in adjustment at home and at school. Siblings chosen for the study were initially screened by the paediatrician for co morbid conditions. We excluded children with comorbidities such as hearing, visual or mood or any other mental disorders. The sample consisted of children belonging to different states throughout the country, 20 of them were from North India and 10 belonged to the Southern parts. A home program consisting of suitable amendments in delivering parent care, increasing support from school and peer mediated play would be designed (developed and practised) to help deal with maladjustment. After a baseline assessment, children would undergo the family-mediated intervention for 6 months. Results would then be compared after the intervention to understand the effectiveness of the treatment plan.

### Procedure

Thirty non-disabled siblings ( $n=30$ ) of children diagnosed with cerebral palsy were randomly selected for the study after obtaining informed consent. All the children ( $n=30$ ) completed the Stanford-Binet Intelligence Test (SBIT), the Connors Parent Rating Scale-Revised (CPRS) and the Draw-a-Family test prior to the intervention. Scheduled interviews were held with both parents and siblings that consisted of two sessions, 1 h for each session. The inventories were administered only after obtaining informed consent from the parents. The test administrators were well-trained and were certified therapists. They explained to the parents that information obtained from the inventories will only be used to help the children through the treatment process and not be used as diagnostic labels. Results from the inventories were not discussed with parents but were kept confidential.

A specific home program was designed so as to improve attention, behavioural adjustment and better academic performance. Parents were encouraged to provide individual attention for the sibling and to be involved in helping the child with routine chores such as feeding, dressing and toileting. As many children expressed during scheduled interviews that fathers were strict and had made more academic demands, we encouraged fathers to spend more time outdoors with their children and step back from being too involved in their academics. Grandparents were also encouraged to provide quality time to children by reading to them or watching a favourite television programme together. Peer involvement during weekends was also planned so that children were engaged purposively and social skills were also maximised. Parents were asked to be more permissive with their children and avoid providing instructions of obedience. They were instead requested to use encouraging statements and to reward the efforts of the child verbally. They agreed to involve the child in doing simple chores at home like cleaning, mopping or gardening. To improve cognitive skills, parents were encouraged to provide a tutor at home and to stop being involved academically. Children were encouraged to structure their study time with the tutor and to set realistic and workable goals. This would help provide children with independence and confidence in learning. The tutor would be of help to the child not on a daily basis but three times a week. This helped break down the coerciveness in the teaching-learning process and

made it less cumbersome, giving the child more space and time. In the clinic, we had observed several other children with behavioural issues and academic problems become more focused and adjusted when parents were less involved in academics.

As parents had to spend time with the disabled child, other family members were also encouraged to provide quality time for the child. Simple arithmetic, word learning games to improve vocabulary, storytelling and games to improve attention span were introduced but also adequate breaks in between executing tasks were also given to the child. Information that the child required to learn was also represented pictorially to simplify learning. Outdoor games such as running, skipping, and trampoline jumping were suggested to reduce hyperactivity. Sleep routine was also discussed with the parents and fathers were encouraged to maximise strong trust and agreeableness in the relationship. Parents during the interview schedule were encouraged not to offload their stress on the sibling as it was detrimental to their development. This family-mediated intervention program was formulated after an extensive discussion with the multidisciplinary team and was handed over to the family after it was demonstrated in the clinic. Parents were encouraged to learn and practise those suggestions for 6 months after which children were reassessed. There were no home visits undertaken during this time but parents were encouraged to visit the department if they had practical difficulties.

## Measures

**The Stanford-Binet Intelligence Test (SBIT):** The Stanford-Binet Intelligence Scale was developed in 1916 and was revised in 1937, 1960, and 1986. The present edition was published in 1986 [11]. Administration of the Stanford-Binet Intelligence Scale typically takes between 45 and 90 min, but can take as long as 2 h and 30 min. The Kuder-Richardson values for internal consistency range from 0.95 to 0.99 across age levels. It consists of four cognitive area scores: verbal reasoning, abstract/visual reasoning, quantitative reasoning, and short-term memory. The test is culturally fair and can be used extensively even among rural children. The composite score is a global estimate of a person's intellectual functioning. The verbal reasoning area score measures verbal knowledge and understanding obtained from the school and home learning environment and reflects the ability to apply verbal skills to new situations. The abstract/visual reasoning area score examines the ability to interpret and perform mathematical operations, the ability to visualise patterns, visual/motor skills, and problem-solving skills through the use of reasoning. The quantitative reasoning area score measures numerical reasoning, concentration, and knowledge and application of numerical concepts. The short-term memory score measures concentration skills, short-term memory, and sequencing skills. Subtests comprising this area score measure visual short-term memory and auditory short-term memory involving both sentences and number sequences.

**The Connors Parent Rating Scale (CPRS-short form):** This instrument is used for routine screenings in schools, mental health clinics, residential treatment centres, paediatric offices, juvenile detention facilities, child protective agencies, and outpatient settings [12]. The goodness-of-fit for this scale has been found to be over 0.81. This test can help in measuring hyperactivity in children and adolescents through routine screening, providing a perspective of the child's behaviour from those who interact with the child on a daily basis, in

establishing a base point prior to beginning therapy and to monitor treatment effectiveness and changes over time. This test provides valuable structured and normed information to further support conclusions, diagnoses, and treatment decisions when the parent, teacher, and self-report scales are combined. The test contains 27 items and covers a subset of subscales namely the oppositional, cognitive problems or inattention, hyperactivity and the attention deficit hyperactivity disorder (ADHD) index.

**The Draw-a-Family test:** This is a projective test that is used to subjectively analyse the child's perception of his relationship with his family [13]. Inter-rater reliabilities for this test and global ratings have generally been greater 0.80. From the picture that a child draws, it is possible to make interpretations about his attachment patterns, underlying conflicts in relationships and family cohesiveness. Inferences about the picture depicted would be verified with parent perceptions and teacher reports to ensure objectivity. The therapist will have to interpret the drawing based on the colours used in the picture, spacing and how the child projects himself in it subjectively.

**Scheduled interviews:** These were specially designed short questionnaires that were used to gather information regarding the child's perception of parental treatment. Questions were open ended and the child was interviewed on a one-to-one basis in a non-threatening manner [14]. The child was asked questions pertaining to self-concept and how secure or insecure he or she felt within the family. The child was encouraged to discuss with the therapist events that made him or her think of being neglected or treated unfairly. Consequently these experiences and interview sessions were held with the parents in a separate session so as to determine if the parents also felt the same [15]. Conversations within the sessions and during assessment and were kept confidential. Parents were given opportunities to discuss difficulties they encountered and how they perceived the child's ability and what they intended to do about it. Interviews held with the child focused on his perception of the difficulties, what he expected from himself and his parents what changes would make a difference to him. Debriefing was done every time a session was completed. Parents were reassured that assessment was not a diagnostic tool but was done only to gather information about the child.

## Results

### Cognitive skills pre and post intervention

Findings revealed that the cognitive skills in siblings, pre intervention, on verbal reasoning ( $M=87.00$ ,  $SD=5.21$ ) had increased significantly ( $p<0.001$ ) post intervention ( $M=94.20$ ,  $SD=4.61$ ). Children had developed skills of vocabulary, semantics in language and also comprehensive abilities. They represented better understanding of words and had begun using correct sentences during verbal expression (Table 1). They exhibited better attention and engagement. Results of t-test revealed that performance on quantitative reasoning had also improved significantly ( $p<0.001$ ) from pre intervention ( $M=86.33$ ,

**Table 1:** Represents the mean and standard deviations for the scores on the Stanford-Binet Intelligence Test (SBIT) in age equivalents pre and post intervention.

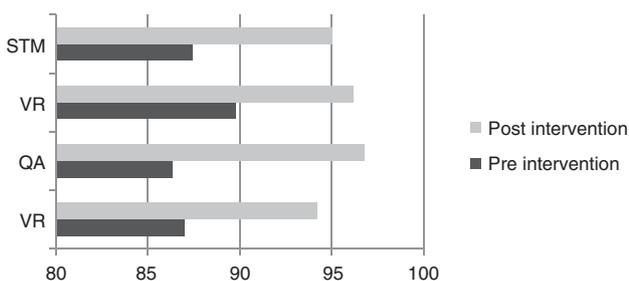
Domains	Pre intervention M (SD)	Post intervention M (SD)	p-Value
Verbal reasoning	87.00 (5.21)	94.20 (4.61)	$1.31 \times 10^{-7}$
Quantitative reasoning	86.33 (5.28)	96.80 (3.50)	$3.58 \times 10^{-3}$
Visual reasoning	89.80 (5.85)	96.20 (3.65)	$1.37 \times 10^{-7}$
Short-term memory	87.46 (5.63)	95.06 (3.77)	$1.90 \times 10^{-9}$

Superscripts denote significant differences as follows:  $p < 0.01$ .  
Statistically significant difference in mean.

SD=5.28) to post intervention (M=96.80, SD=3.50). Children had gained a better understanding of numbers, counted correctly and also participated in solving simple numeric calculations (Figure 1). Scores on the visual reasoning ability had also improved significantly ( $p < 0.001$ ) from pre intervention (M=89.80, SD=5.80) to post intervention (M=96.20, SD=3.65). Siblings were able to arrange simple geometric shapes and also copy figures correctly without much difficulty. Scores on short-term memory was also observed to have remarkably improved ( $p < 0.001$ ) from pre intervention (M=87.46, SD=5.63) to post intervention (M=95.06, SD=3.77).

## Behavioural profile pre and post intervention

Findings on the CPRS-Short Form revealed that a large proportion (66%) of siblings score above the 50th percentile on oppositional defiant behaviour pre intervention (Table 2). Siblings exhibited attention seeking behaviour and also rebelliousness. We observed that a significant number of siblings (60%) were noted to have hyperactivity. It had become difficult to channelise their energy at home and at school. Parent reports suggested that they were difficult to engage and were “on-the-go”. Siblings



**Figure 1:** Represents the scores on cognition on SBIT (Stanford-Binet Intelligence Test) in age equivalents pre and post intervention.

pre intervention, were observed to have significant behavioural markers above the 50th percentile on domains of ADHD index (57%). Post intervention, remarkable improvements were noted across all domains (Table 3). Scores drastically dropped (27%) on the oppositional defiant domain, as children became emotionally stable showed more participation. They followed instructions and understood the principles of reward and punishment. Hyperactivity (24%) and inattention problems (23%) had also gradually declined. Siblings were able to appreciate structured environments and they sought less help from their primary care givers on aspects related to daily living. Scores on the cognitive problems (14%) and ADHD index (14%) also reduced due to better academic engagement and effective tutoring.

## Perception of familial relationship pre and post intervention

Findings on the Draw-a-Family test were subjectively interpreted by the therapist after discussing relevant issues with the help of scheduled interviews. Siblings exhibited feelings of neglect (33%), perceived differential treatment (30%) and also expressed feeling of being ignored and not having individual attention (Table 4). On the test that was depicted, children drew the father figures as central and domineering (13%). This clearly indicted feelings of being displaced. Fathers were often perceived as authoritative figures and not as companions. Sibling rivalry was also observed in their representations (13%). Siblings expressed the absence of mothers in the Draw-a-Family test and lack of emotional connectedness was also observed (17%). Post intervention 19 siblings (63%) did not have any concern in neglect, differential parental treatment or father dominance. They drew pictures that represented better cohesiveness, mood and family functioning. Children who initially expressed neglect now showed better improvement (10%). Fathers were more nurturing and provided assisted care to children and were less involved in disciplining (7%). Parents were able to provide equivalent and divided attention and were able to be more expressive towards children. Perception of differential treatment had declined (10%) and sibling rivalry issues were less prevalent (3%). Siblings embarked on better acceptance and communication with the disabled child.

## Discussion

Children of siblings with a disability face distinct challenges and according to recent studies [14] having a

**Table 2:** Represents the percentage of siblings with behavioural problems on the Connors Parent Rating Scale (CPRS) across percentile ranks, pre intervention.

Percentile ranks	Oppositional, %	Hyperactivity, %	Inattention, %	Cognitive problems, %	ADHD index, %
0<25	7	10	17	20	3
25<50	27	30	33	40	40
50<75	33	33	33	33	40
75<100	33	27	17	7	17

**Table 3:** Represents the percentage of siblings with behavioural problems on the Connors Parent Rating Scale (CPRS) across percentile ranks, post intervention.

Percentile ranks	Oppositional, %	Hyperactivity, %	Inattention, %	Cognitive problems, %	ADHD index, %
0<25	40	33	43	47	43
25<50	33	43	33	43	43
50<75	17	17	20	7	7
75<100	10	7	3	7	7

**Table 4:** Represents the percentage of siblings with psychological distress on subjective domains interpreted from the Draw-a-Family test pre and post intervention.

	Neglect, %	Differential treatment, %	Father dominance, %	Sibling rivalry, %	Maternal apathy, %
Pre intervention	33	30	13	13	17
Post intervention	10	10	7	3	7

sibling with a developmental disability have lead to lower scores of about 4 points on a reading test such as the Woodcock Johnson and a 6 point lower score on a letter-word identification test. Results from the present study, denote that siblings of children affected by cerebral palsy on the SBIT have secured lower scores on verbal reasoning, short-term memory, visual reasoning and also on numerical skills. Their age equivalent scores on these domains were lower than their chronological ages. The effect of having a disabled sibling at a young age is widely found to be negative rather than positive [16]. Research that goes beyond preschool aged siblings focuses on behavioural adjustment [17], and there is little research on the educational outcomes of siblings of disabled children. The present study is an attempt to study factors that contribute to maladjustment observed in the sibling without the disability.

Post intervention, children have exhibited better verbal reasoning skills ( $M=94.20$ ,  $SD=4.61$ ). They described words, used it in relevant sentences and were verbally more spontaneous expressive. There was an improvement in the semantics of language. Siblings showed remarkable improvements in numerical skills ( $M=96.80$ ,  $SD=3.50$ ). They demonstrated understanding of numbers, counted correctly and solved simple number

problems. Scores on the visual reasoning subtest had also improved significantly ( $M=96.20$ ,  $SD=3.65$ ). They were able to arrange blocks according to the design shown to them and could copy simple geometric figures. Their short term memory had improved ( $M=95.06$ ,  $SD=3.77$ ). They could repeat a sequence of numbers confidently without committing much of errors.

The family-mediated intervention has thus been an effective one. Individual attention from parents, structuring the learning time and providing the child opportunity to be autonomous in making choices to learn has facilitated better academic performance. Parents had learnt to step back from playing very dominant roles in making decisions regarding academic work. Sustained inputs from the tutors and encouragements in the form of rewards and verbal appreciation had moulded the environment of the sibling making him or her feel more at ease.

According to a recent study, siblings of children with disability were more likely than siblings residing with typically developing children to have problems with interpersonal relationships, psychopathological functioning, functioning at school, and use of leisure time [18]. They were almost three times more likely to have parent-reported emotional and behavioural problems than siblings of typically developing children. Siblings of children

with physical and emotional disabilities may be exposed to more stressful situations at home than siblings of typical developing children. A child with special health-care needs may require more time, energy, and financial resources from parents causing parents to also experience higher levels of stress and anxiety. Problems at school included children failing to complete their school work on time or at all, and not wanting to participate in leisure and sports activities.

From the results of the study we observed a significant level (above 50th percentile) of behavioural markers pre intervention across the CPRS-Short Form on domains such as oppositional defiant behaviour (66%), hyperactivity (60%), inattention (50%), cognitive problems (40%) and also on the ADHD index (57%). Parents or siblings in families of children with developmental disability may themselves experience more problems, or various family sub-systems might be affected. Children tend to adjust better if they do not experience feelings of rejection, blame or favouritism by their parents [19]. However, other studies revealed the negative impact that such experiences can have on families, or variables that jeopardise the adjustment of typically developing siblings. Thus, some studies indicate social isolation of siblings, low self-esteem, problems with adjustment and communication, or limited family interaction [20]. Some other negative effects are psychological disorders such as aggression, anxiety, somatisation, depression and behavioural problems, low self – esteem, low self-concept and low social skills [21].

Post intervention, we observed a remarkable change in their behaviour, siblings were better adjusted. Their hyperactivity (24%) and inattention (23%) dropped below the 50th percentile. Scores on the Oppositional scale remarkably declined (27%) and a reduction in the levels of cognitive problems were also reportedly less (14%). This suggests that the intervention had been successful in reducing behavioural problems. Parents during the structured interview schedules described the structuring of home environment and using appropriate parenting styles. Rebelliousness had gradually declined as parents began to nurture rather than discipline children. The use of praise and recognition for the efforts siblings took made children feel comfortable and secure. Siblings were adequately engaged at home by the use of performance related tasks. At school outdoor games had helped them channelise their energy. Grandparents were also significantly involved. Peer interaction after school hours had enabled many siblings deal with low self-esteem issues and helped them focus on constructive things. A time schedule was practised at home whereby there was a

clear discrimination between various activities. Parents had improvised the sleep and wake hygiene to deal with hyperactivity. It was also ensured that the quality of family interactions did not revolve around the disabled child but rather the “displaced” child. Parents had a record of the activities they did at home. They followed the written program that had suggestions and recommendations. They were requested to approach the clinic any day for queries or help in continuing the program. Mothers were encouraged to spend more time with the sibling having conversations that revolved around the daily routine, classroom activities, peer relationships or hobbies of the child. Fathers participated by reading to the child during bedtime, doing gardening or visiting the market on a regular basis. This helped improve the level of trust and engagement among the family members.

Pre intervention, the Draw-a-Family test revealed disturbances in relationships. Children represented neglect (33%) as a main theme in the drawing. They drew figures of the family in which they represented a negative emotion of not smiling and some even drew unhappy faces. When asked to describe it in the one-to-one session, they expressed feeling of dejection and hopelessness. They narrated events in the family that made them feel unwanted and uncomfortable. Since parents could not afford to spend time with the family, siblings expressed more hostility to their parents specifically the mother. Siblings also expressed differential treatment (30%). They perceived that there was favouritism towards the special child and that the family revolved around the “needy sibling”. This created more sibling rivalry (13%) and hostility towards the special child. Siblings knew that parents had to spend time at hospitals and give care for activities of daily living in assisting the child with disability but they demanded attention. Rebelliousness had escalated and since fathers made decisions regarding school and were involved in disciplining them, they had more oppositional behaviour towards the fathers and anger towards the mother. “Tantrums” were common and siblings sought immediate gratification. The interview schedules were informative in understanding parent-child conflict at home. Teachers too contributed in sharing their experiences about the child’s behaviour. During the Draw-a-family test, children were requested to interpret and describe what they had drawn. Such projective techniques, helped in obtaining a better inference about the behaviour.

Childhood is a critical time of development and intervention, and evidence suggests that a significant proportion of childhood disorders have a chronic course, and although they may alter in form, continue into adulthood. Studies have revealed that siblings of children with

disabilities are at no greater risk of developing internalising or externalising behavioural problems when compared to siblings of typically developing children [22] however, there was high variability in the adjustment of siblings, with 40% of typically developing siblings having scores in the borderline and clinical ranges. Post intervention, siblings were more emotionally competent and well adjusted. Behaviour towards parents had improved. Perception of neglect (10%) and differential treatment had reduced (10%), father dominance had also gradually declined (7%) and children felt more comfortable at home. They were able to discuss at ease in the one-to-one sessions. Sibling rivalry had reduced considerably (3%). Parents had sustained input at home and had strived to build the relationship between themselves. The current study revealed that only a small percentage of siblings are vulnerable to psychosocial and behavioural problems. A series of risk and protective factors across sibling, family, and wider social community levels were identified as predictors of adaptability. Parental differential treatment was shown to be a significant predictor for effective adjustment. The current study has identified several important implications for practise that can be used to facilitate sibling adjustment. These factors should be viewed as vital components for the design of effective interventions for siblings of children with disabilities. Further, evaluation of sibling interventions by practitioners is essential in terms of the effectiveness of intervention on siblings, families and children with a disability.

## Conclusion

The current research has provided a theoretical and empirical basis for guiding the assessment of the experiences of siblings of children with disabilities and their emotional and behavioural adjustment within the family. The study also highlights the influence of differential parental treatment on family cohesiveness and sibling relationships. Clinicians need to be familiar with the current literature, including outcomes for siblings as well as the range of influencing factors shown to be associated with these behavioural problems. It is also vital to recognise how this can be disabling for the child in academic achievement. Very few researches in the past have focused on the effects of disability within the family on educational achievement. It is important that practitioners are aware of the various psychological outcomes, and the potential that various factors generate on different sibling outcomes.

Factors at a family level were associated with difficulties characterised by conduct problems, emotional symptoms, hyperactivity/inattention, and cognitive skills. As such, it is essential that these characteristics are considered in the assessment process. Without this knowledge, it is difficult to ask the questions needed to obtain a comprehensive formulation of the sibling and more broadly the family. Having a balanced view of sibling outcomes, from different informants, and identifying the positives of growing up with a family member who has a disability is another ingredient in delivering support. Ascertaining positive psychological adjustment can strengthen siblings and families, providing them with the resources to manage undesirable outcomes. This information is vital in guiding the intervention plan for the unique needs of the sibling and broader family, and as such it is an imperative component in supporting families of children with disabilities.

The limitations of the study are that the research designs used in the study could be subject to an excessive level of potential bias. Secondly, randomisation control trials could have been used to make the research more concrete. Another limitation is that there was failure in establishing a control group for the study. Since the study was focused on siblings of children with cerebral palsy, the findings may lack generalisability. This research has considered the use of both qualitative and quantitative methods but there could have been a more satisfactory assessment of the impact of family-mediated interventions. The intervention model used in the study was only a likely factor that contributed in the participant scores but did not distinguish itself as the only factor. Studies need to involve both short and long-term outcome information in order to evaluate more comprehensively.

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