



## Evaluation of a family-based intervention for siblings of children with a disability or chronic illness

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### Abstract

This paper describes the outcomes of a 6-week family-based psycho-educational intervention for siblings of children with a disability or chronic illness. A randomised controlled trial method was used with 21 siblings (aged 8-16 years) and their parents. Results revealed a decrease in siblings' emotional symptoms, perceived intensity of daily stress, and use of avoidant coping; a strengthening of family time and routines; and high parental satisfaction with the program. Given the limited number of well-controlled sibling intervention studies, this research is an important step towards developing empirically supported sibling interventions, and is of significance to professionals working with families of children with a disability or chronic illness.

### Key words

*siblings, children, disability, chronic illness, adjustment, families, family-based interventions*

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### Introduction

The wellbeing of siblings with a brother or sister with a disability or chronic illness has received considerable attention, with research indicating that they are at risk of adjustment difficulties. A recent Australian study (Giallo & Gavidia-Payne, 2006) reported that these children had significantly more adjustment difficulties, emotional symptoms and peer problems when compared with normative sample data. This finding is consistent with reviews indicating that siblings of people with a disability or illness report significantly more problems with depression, anxiety and externalising behaviours than do siblings of typically developing children (Rossiter & Sharpe, 2001; Sharpe & Rossiter, 2002; Summers, White & Summers, 1994;

Williams, 1997). Specifically, internalising behaviour problems have been reported for siblings of children with an intellectual disability (Gamble & McHale, 1989), autism (Ross & Cuskelly, 2006), and cancer (Cohen, Friedrich, Jaworski et al., 1994; Houtzager, Grootenhuis & Last, 1999). Longitudinal research shows that such problems may persist over time and into adulthood for some siblings (Breslau & Prabucki, 1987; Fisman, Wolf, Ellison & Freeman, 2000; Houtzager, Grootenhuis, Caron & Last, 2004). Given this body of evidence, there is a pronounced need for the provision of effective support and intervention services.

Several approaches to supporting siblings are available including peer support groups, counselling, parent information sessions, and

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internet resources; however, few studies to evaluate their effectiveness in improving outcomes for siblings have been conducted. Outcomes associated with support groups have received the most attention, but have produced mixed findings. Williams, Williams, Graff et al. (2003) reported a decrease in behaviour problems and an improvement in mood and self-esteem for siblings who had participated in a group compared to siblings in a waitlist condition. Similarly, Phillips (1999) reported a decrease in anxiety and depression, and an improvement in self-esteem in the sibling intervention group compared to the waitlist condition. In contrast, two non-randomised but controlled studies reported no changes in self-concept, internalising and externalising behaviour for siblings of children with cancer (Heiney, Goon-Johnson, Ettinger & Ettinger, 1990) or disabilities (McLinden, Miller & Deprey, 1991).

Despite tentative findings regarding the effectiveness of groups, there are several conceptual issues with this form of support. First, support groups are primarily recreational, providing opportunities for siblings' interactions with peers experiencing similar life circumstances. Although peer support may be beneficial for some siblings, the opportunity to learn about disability/illness and to strengthen coping skills is largely incidental. Considering the evidence that siblings are at risk of enduring internalising behaviour problems, interventions focusing specifically on strengthening siblings' coping skills may be the most effective intervention approach. Skill-based, cognitive-behavioural interventions have been well documented for many childhood adjustment problems including internalising behaviour difficulties (e.g., Barrett, 1998; Dadds, Spence, Holland et al., 1999), and may be particularly beneficial for siblings. Further development and evaluation of such approaches are important directions in building the evidence behind sibling interventions.

Several studies report on skill-based interventions drawing upon cognitive-behavioural principles. For instance, Evans, Jones and Mansell (2001) reported that a group consisting of psycho-education, relaxation techniques and problem-solving strategies was

effective in improving self-esteem and family relationships for 10 siblings of children with learning disabilities. In another study with 24 siblings of children with cancer, there was a decrease in anxiety following participation in a group providing psycho-education and problem-solving activities (Houtzager, Grootenhuis & Last, 2001). Finally, Lobato and Kao (2002) evaluated a group intervention for a larger sample of 54 sibling-parent dyads of children with a chronic illness or developmental disability, providing psycho-education, strategies for managing emotions, and problem-solving activities. An increase in sibling knowledge of disability/illness and a decrease in negative adjustment outcomes following intervention was maintained at three months. Although all studies used a pre-post test design with no control group, these findings indicate that cognitive-behavioural approaches to sibling support are promising.

A second limitation of groups is that they primarily offer direct support to siblings, failing to address their adjustment within the context of the family. Few interventions offer concurrent parent or joint sibling-parent sessions (e.g., Lobato & Kao, 2002). Interventions that focus on supporting parents and the overall family are an important consideration given the growing body of literature indicating a strong relationship between sibling, parent and family functioning (e.g., Giallo & Gavidia-Payne, 2006; Van Riper, 2000; Williams, Williams, Graff et al., 2002). In a recent study, Giallo and Gavidia-Payne (2006) found that high levels of parent stress, poor family communication and problem-solving, and limited time spent together as a family, were predictive of sibling adjustment problems. Therefore, interventions targeting both parent and family functioning, as well as sibling functioning, may be helpful.

Supporting parents to manage sibling related issues is also important given that parents indicate concern about the impact of disability or illness on siblings and the overall family. Parents report that the needs of other children in the family are often neglected and that information on strategies to help them address these situations would be valuable (Department of Family and Community Services, 2004). In another study, parents of children with

developmental disabilities identified that they wanted support for issues relating to family functioning, such as learning how to support each other during difficult times (Ellis, Luiselli, Amirault et al., 2002). Addressing parent concerns about the impact of disability or illness on the family, and supporting them to strengthening family functioning, may be just as important as direct support to siblings.

It is in the context of the current conceptual and empirical strengths and gaps in the sibling intervention literature that the authors developed *Sibstars*, a family-based psycho-educational intervention for siblings (aged 8-16 years) and parents of children with a disability or chronic illness. It aims to: (a) assist parents and siblings to strengthen their coping skills to deal with daily stress, (b) assist parents to strengthen parenting skills that will enable them to support siblings, and (c) help families to strengthen their communication and problem-solving skills, routines, and time spent together as a family. The program content was informed by research into effective cognitive-behavioural prevention and intervention programs for children with emotional and behavioural adjustment difficulties (Barrett, 1998; Dadds et al., 1999), and on effective family-based approaches to working with children, parents and families experiencing difficult life circumstances (e.g., Diamond, Serrano, Dickey & Sonis, 1996; Dunst, Boyd, Trivette & Hamby, 2002; Walsh, 2003).

This report presents the outcomes of a pilot evaluation of *Sibstars* using a randomised controlled trial design. The first aim was to obtain preliminary data regarding the effectiveness of *Sibstars* in (a) strengthening sibling coping, parenting behaviour, family problem-solving communication, family time and routines, and family hardiness, and (b) decreasing sibling stress, and sibling adjustment problems. A second aim was to assess families' satisfaction with the intervention. This is an important first step in the development and evaluation of new interventions (Foster & Mash, 1999; Matthews & Hudson, 2001). It was expected that this study would inform further development of the program.

## Method

### *Participants*

Participants were 21 siblings (aged 8-16 years) and parents of children with an intellectual, sensory, physical, or developmental disability and/or a chronic illness, residing at home. A non-categorical, non-disability or illness specific approach to recruitment was taken. There is debate as to whether children with different etiologies should be combined as a heterogeneous group or studied separately (see Hoddap & DesJardin, 2002; Stein, Bauman, Westbrook et al., 1993). The non-categorical approach is based on the assumption that regardless of the specific condition, families have similar experiences caring for an individual with serious ongoing disability or illness, which limits functional or communication abilities, and may require extra medical care or ongoing treatment.

Over an 18 month period, 28 families inquired about the intervention. Four families chose not to participate for reasons including sibling disinterest and limited availability to complete the program. The remaining families were randomly allocated to either an intervention or waitlist control group using a computer generated allocation sequence. One family in the waitlist condition dropped out due to limited availability to complete the program, and a further two families who had completed the intervention failed to return post-intervention surveys. The final number of participating families was 21 (intervention,  $n=12$ ; waitlist,  $n=9$ ). Demographic characteristics are presented in Table 1. Independent sample  $t$ -tests and chi-square analyses revealed no differences between the groups.

### *Procedure*

Following ethics approval from RMIT University, 11 disability and health service providers in Victoria advertised the program. At pre-test, all families received project information, consent forms and questionnaires. The intervention group completed post-test questionnaires approximately 2 weeks after the intervention, while the waitlist group completed post-test questionnaires after an 8 week period of no contact from the researchers. All waitlist families were offered the intervention following post-test.

**Table 1. Sample demographics**

Variable	Intervention (n =12)	Waitlist Control (n =9)
<b>Siblings</b>		
Age of siblings in years ( <i>M, SD</i> )	11.75 (2.86)	11.00 (2.29)
Age range (years)	9-16	8-16
Sex	<b>n (%)</b>	<b>n (%)</b>
<i>Female</i>	6 (50.0%)	6 (66.7%)
<i>Male</i>	6 (50.0%)	3 (33.3%)
Age in relation to child with disability		
<i>Older</i>	7 (58.3%)	8 (88.9%)
<i>Young</i>	5 (41.7%)	1 (11.1%)
Attended sibling group in past	7 (58.3%)	5 (55.6%)
<b>Parent</b>		
Respondent's age ( <i>M, SD</i> )	43.83 (6.63)	41.78 (3.99)
Relationship to child	<b>n (%)</b>	<b>n (%)</b>
<i>Biological mother</i>	12 (100%)	9 (100%)
Family structure		
<i>Couple family</i>	11 (91.7%)	9 (100%)
<i>Single parent family</i>	1 (8.3%)	-
Respondent's country of origin		
<i>Australia</i>	9 (75.0%)	8 (88.9%)
<i>Overseas-born</i>	3 (25.0%)	1 (11.1%)
Language spoken at home		
<i>English</i>	12 (100%)	9 (100%)
Respondent's employment		
<i>Full-time</i>	1 (8.3%)	2 (22.2%)
<i>Part-time</i>	6 (50.0%)	4 (44.4%)
<i>Not working</i>	5 (41.7%)	3 (33.3%)
SES Index ( <i>M, SD</i> )	1036.68 (51.85)	1062.28 (68.43)
n children in family ( <i>M, SD</i> )	2.75 (.62)	2.56 (0.53)
<b>Child with disability or illness</b>		
Age of child in years ( <i>M, SD</i> )	10.92 (4.21)	10.07 (4.67)
Age range (years)	3-16	6-21
Sex	<b>n (%)</b>	<b>n (%)</b>
<i>Male</i>	7 (58.3%)	5 (55.6%)
<i>Female</i>	5 (41.7%)	4 (44.4%)
Type of disability		
<i>Down Syndrome</i>	1 (8.3%)	3 (33.3%)
<i>Autism</i>	3 (25.0%)	2 (22.2%)
<i>ADHD</i>	1 (8.3%)	-
<i>Polymicrogyria</i>	1 (8.3%)	-
<i>Multiple disabilities</i>	2 (16.7%)	1 (11.1%)
<i>Cystic Fibrosis</i>	-	1 (11.1%)
<i>Congenital Heart Disorder</i>	2 (16.7%)	-
<i>Multiple illnesses</i>	-	1 (11.1%)
<i>Williams Syndrome</i>	1 (8.3%)	1 (11.1%)
Severity of disability (parent rated)		
<i>Mild</i>	3 (25.0%)	5 (55.6%)
<i>Moderate</i>	8 (66.7%)	1 (11.1%)
<i>Severe</i>	1 (8.3%)	3 (33.3%)

**Measures**

Parents provided information about family and disability characteristics, sibling adjustment, parent stress, parenting practices, family functioning, and satisfaction with the program.

*The Strengths and Difficulties Questionnaire - Parent Version* (SDQ; Goodman, Meltzer & Bailey, 1998) consists of 25 items assessing children's (4-16 years) emotional and behavioural functioning. Subscales include Conduct Problems, Hyperactivity, Emotional Symptoms, Peer Problems and Pro-social Behaviour, and an overall Total Difficulties scale. Cronbach's  $\alpha$  coefficients for the current sample ranged from .73 and .63.

*The Perceived Stress Scale* (PSS; Cohen, Kamarck & Mermelstein, 1983) consists of 10 items assessing the physiological, cognitive and behavioural symptoms of stress on a 5-point scale. High scores indicate greater perceived stress. Cronbach's  $\alpha$  coefficient for the sample was .85.

*The Parent Behaviour Questionnaire* (PBQ; Gordon, 1994) consists of eight items measuring how often parents use various parenting strategies such as active listening, using praise and giving clear instructions. Higher scores reflect more frequent use of the strategies. Cronbach's  $\alpha$  coefficient for the sample was .81.

*The Family Hardiness Index* (FHI; McCubbin, Thompson & McCubbin, 1996) assesses the strength and durability of the family when experiencing difficult circumstances. The 20 items are measured on a 4-point scale with high scores indicating greater family hardiness. Cronbach's  $\alpha$  coefficient for the sample was .72.

*The Family Problem Solving Communication Index* (FPSC; McCubbin et al., 1996) consists of 10 items rated on a 4-point scale with high scores indicating greater use of problem-solving and communication strategies in the family. Cronbach's  $\alpha$  coefficient for the sample was .84.

*The Family Time and Routines Index* (FTRI; McCubbin et al., 1996) consists of 25 items measured on a 4-point scale with high scores indicating greater family engagement in regular routines and time spent together. Cronbach's  $\alpha$  coefficient for the sample was .70.

*The Australian Bureau of Statistics, Socio-economic Indexes for Areas* (SEIFA; Castles, 1993), was used to identify families' socio-economic status (SES) based on their postal area code. The Index of Relative Socio-economic Disadvantage is based on low income, high unemployment and low educational achievement according to local geographical areas. Higher scores reflect relatively better economic status. For the geographical areas in Victoria, the minimum, maximum, and median index values are 530.01, 1186.54 and 1026.98 respectively.

Siblings completed the following measures. Parents may have assisted siblings to complete the survey if necessary; however, few reports of parental assistance were made.

*The Sibling Daily Hassles and Uplifts Scale* was based on items from the Daily Life Stressors Scale (Kearney, Drabman & Beasley, 1993), and a study by Giallo and Gavidia-Payne (2005). Siblings rated the frequency and intensity of 43 hassles (e.g., I get upset when my brother/sister with a disability cries or gets upset), and 24 uplifts (e.g., When my brother/sister with a disability learns something new) on a 5-point scale. High scores indicated greater occurrence of events, perceived stress for hassles, and positive affect associated with uplifts. Cronbach's  $\alpha$  coefficients for Hassles-Frequency ( $\alpha=.91$ ), Hassles-Intensity ( $\alpha=.94$ ), Uplifts-Frequency ( $\alpha=.89$ ), and Uplifts-Intensity ( $\alpha=.90$ ) revealed high internal consistency on these subscales.

*The Self-Report Coping Scale* (SCS; Causey & Dubow, 1992) consists of 34 items assessing approach and avoidance coping strategies. Approach coping refers to actively dealing with problems, and has two subscales, Problem Solving and Seeking Social Support. Avoidance refers to strategies that do not actively address problems, and has three subscales, Distancing, Internalising and Externalising. Cronbach's  $\alpha$  coefficients for the sample ranged from .65 to .87 for the subscales.

*The Participant Satisfaction Questionnaire* was developed for the current study. Siblings and parents rated various aspects of the program (e.g., content, delivery) on a 5-point scale

(1=strongly disagree; 5=strongly agree), and were asked to provide a written comment about their participation. To guard against social desirability or other response bias, this survey was anonymous.

### ***Sibstars program content***

*Sibstars* is a 6-week family-based psycho-educational intervention for siblings and parents. It was delivered to individual families using written information and telephone support (see Table 2 for an overview of the program). After the first face-to-face session, each week families were required to read an information booklet and complete the practice activities provided. Siblings completed the activities independently or with parental assistance if required. Telephone support to siblings and parents was provided weekly by a clinician with postgraduate psychology training to discuss progress through the information booklet and practice activities. Sessions were 20-30 minutes in duration. Complexity of the discussions varied depending upon the age of the siblings.

A program adherence checklist to record the degree to which the content was covered during each of the telephone sessions with all families was completed. Between approximately 85% and 92% of the content was covered with siblings and parents, respectively. The percentage of the workbook tasks completed by the participants was between 80% and 100%.

## **Results**

### ***Data screening and analysis strategy***

Assumptions of normality and homogeneity of variances were met, and there were no missing data or outliers. Single-factor, between-subjects analyses of covariance (ANCOVA) were conducted to compare the intervention and waitlist groups on the measures at post-intervention, whilst using the pre-test scores as a covariate. Effect sizes for  $\eta^2$  were reported (small, 0.01; medium, 0.06; and large, 0.14). Clinical significance of the intervention outcome was assessed using the Reliable Change Index (RCI), and social validity data were summarised using descriptive statistics.

Table 2. Overview of the *Sibstars* program

Session	Topics covered in the information booklets	Example workbook activities
<b>Sibling program</b>		
Session 1: Introduction	<ul style="list-style-type: none"> <li>• Face-to-face session.</li> <li>• Outline of the program, how to use the booklets, and details of telephone support.</li> </ul>	<ul style="list-style-type: none"> <li>• Not applicable.</li> </ul>
Sessions 2 & 3: Coping with Things that Stress You Out	<ul style="list-style-type: none"> <li>• Explores positive and negative sibling experiences.</li> <li>• Dealing with difficult times.</li> <li>• Helpful and unhelpful thinking.</li> <li>• Getting support from others.</li> </ul>	<ul style="list-style-type: none"> <li>• Draw pictures or write about good times and things that bother you.</li> <li>• Write about who you talk to about the good and bad times.</li> </ul>
Session 4: Getting Along with Others	<ul style="list-style-type: none"> <li>• Helpful and unhelpful ways of dealing with others in common situations faced by siblings (e.g., embarrassing situations with friends, interruptions to plans because of their brother or sister).</li> <li>• Asking others for help.</li> </ul>	<ul style="list-style-type: none"> <li>• Think about a time when someone said something about your sibling that upset you? What did you do to handle it?</li> </ul>
Sessions 5 & 6: Dealing with Problems	<ul style="list-style-type: none"> <li>• Social problem-solving using some examples commonly faced by siblings.</li> </ul>	<ul style="list-style-type: none"> <li>• Think about something that bothers or upsets you. Use the problem-solving steps to think about how you can deal with this problem.</li> </ul>
<b>Parent program</b>		
Session 1: Introduction	<ul style="list-style-type: none"> <li>• Same as Session 1 for siblings.</li> </ul>	
Session 2: Stress in the Family	<ul style="list-style-type: none"> <li>• Identifying and strengthening practical ways parents manage their own feelings of stress, as well as helping other family members deal with challenging situations, such as preventing stress, social support, challenging unhelpful thinking, and relaxation.</li> </ul>	<ul style="list-style-type: none"> <li>• Think about ways you manage stress. What works well for you? What would you like to do differently?</li> </ul>
Session 3: Dealing with Children's Behaviour	<ul style="list-style-type: none"> <li>• Promoting good behaviour in children.</li> <li>• Identifying triggers for behaviour difficulties.</li> <li>• Reinforcing appropriate behaviour.</li> <li>• Dealing with inappropriate behaviour.</li> <li>• Managing differences in parenting a child with disability and their siblings.</li> </ul>	<ul style="list-style-type: none"> <li>• Parents often worry about differences in the way they parent the child with a disability and their siblings. Are there different rules and expectations for the children in your family? What works well in managing this?</li> </ul>
Session 4: Managing Family Time and Routines	<ul style="list-style-type: none"> <li>• Exploring practical ways families can manage their time, home routines and demands of family life, such as dealing with disruptions and making time for siblings.</li> </ul>	<ul style="list-style-type: none"> <li>• Think about how your family spends time together. What do you do well together? What would you like to do more of together? What plans can be put in place to make this happen?</li> </ul>
Session 5: Communication in the Family	<ul style="list-style-type: none"> <li>• Enhancing communication and family relations.</li> <li>• Strategies for talking to siblings about disability.</li> <li>• Helping siblings to understand their brother or sister, and explain disability to others.</li> </ul>	<ul style="list-style-type: none"> <li>• Think about concerns you have had or have in talking to and helping siblings understand disability or illness.</li> </ul>
Session 6: Dealing with Problems in the Family	<ul style="list-style-type: none"> <li>• Problem-solving strategies for the whole family to work together to deal with difficult situations.</li> </ul>	<ul style="list-style-type: none"> <li>• Use the problem-solving steps with your family to deal with a low-level difficult situation.</li> </ul>

### **Sibling outcomes**

Descriptive statistics for sibling functioning are presented in Table 3. At post-intervention, the intervention group had significantly lower Emotional Symptoms subscale scores than the waitlist group,  $F(1,18)=4.86$ ,  $p=.041$ ,  $\eta^2=.10$ . The intervention group also had significantly lower perceived intensity of daily hassles stress related to the child with a disability or illness than the waitlist group at post-test,  $F(1,18)=6.27$ ,

$p=.022$ ,  $\eta^2=.26$ . Finally, the intervention group reported significantly less use of distancing coping than the waitlist group at post-intervention,  $F(1, 8)=9.74$ ,  $p=.006$ ,  $\eta^2=.35$ .

### **Parent and family outcomes**

Table 4 shows the descriptive statistics for parent and family outcomes. At post-intervention, the intervention group reported that they engaged in more family time and routine activities than the waitlist group,  $F(1,18)=6.02$ ,  $p=.025$ ,  $\eta^2=.25$ .

**Table 3. Descriptive statistics for Intervention and Waitlist Control conditions at pre- and post-intervention on sibling functioning variables**

Dependent Variable	Intervention (n = 12)				Waitlist Control (n = 9)			
	Pre		Post		Pre		Post	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<b>Sibling adjustment</b>								
Total difficulties	17.08	6.69	8.50	6.47	14.78	3.99	8.11	4.08
Emotional symptoms	3.17	1.85	1.83	2.37	2.00	1.32	2.22	1.92 *
Conduct problems	1.50	1.45	1.42	1.51	1.11	1.05	1.22	0.97
Hyperactivity	3.00	3.38	3.08	2.78	2.78	2.05	2.44	2.30
Peer problems	1.92	1.73	2.17	1.90	2.22	1.48	2.22	1.48
Pro-social behaviour	7.50	1.73	8.42	1.78	6.67	1.58	7.00	1.68
<b>Sibling daily hassles - Frequency</b>								
Home	35.75	7.71	36.00	10.87	37.00	6.75	34.22	6.91
Parents	20.25	3.28	19.25	3.79	23.22	5.67	20.11	2.57
Child with disability/illness	62.00	21.04	56.25	17.48	62.78	14.86	61.33	11.87
<b>Sibling daily hassles - Intensity</b>								
Home	31.08	9.28	30.33	9.33	34.78	7.98	32.89	6.68
Parents	21.25	5.58	20.25	6.18	25.33	6.32	23.56	3.50
Child with disability/illness	55.83	20.54	50.83	16.71	63.22	19.12	66.00	15.97 *
<b>Sibling daily uplifts - Frequency</b>								
Home	27.17	3.97	26.92	4.38	24.44	4.25	26.00	4.21
Parents	20.67	3.20	21.25	3.70	20.89	3.95	20.11	3.41
Child with disability/illness	31.75	10.85	33.92	6.49	30.33	7.26	30.44	4.95
<b>Sibling daily uplifts - Intensity</b>								
Home	34.58	2.91	32.92	4.44	34.33	4.64	33.11	4.37
Parents	25.58	3.70	24.58	3.82	26.33	2.06	25.22	3.23
Child with disability/illness	37.33	10.65	38.58	11.36	36.67	9.03	36.44	6.98
<b>Sibling coping</b>								
Social support	23.75	5.05	24.75	3.39	19.22	5.93	20.33	5.43
Problem solving	24.42	3.32	26.00	3.02	21.67	5.45	22.44	4.10
Distancing	18.83	4.22	15.58	5.32	17.11	3.79	19.55	3.61 **
Internalising	16.75	4.18	15.58	5.11	18.00	5.10	17.33	5.41
Externalising	9.58	2.78	8.50	9.00	9.56	3.64	9.00	3.43

\*  $p < .05$  \*\* $p < .01$ **Table 4. Descriptive statistics for Intervention and Waitlist Control conditions, pre- and post-intervention on parent and family functioning variables**

Dependent Variable	Intervention (n=12)				Waitlist Control (n=9)			
	Pre		Post		Pre		Post	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<b>Parent factors</b>								
Perceived stress	20.75	5.83	17.00	6.51	16.89	3.59	13.78	6.70
Parenting behaviour	28.00	9.75	30.08	11.97	23.00	6.54	20.67	9.38
<b>Family resilience factors</b>								
Family problem-solving communication	19.67	4.77	21.58	5.35	18.44	4.10	18.89	4.01
Family hardiness	41.17	8.14	42.42	6.93	42.78	5.83	40.56	6.54
Family time & routines	50.50	6.35	51.75	5.88	48.44	7.81	45.00	7.35 **

\*\* $p < .01$

**Clinical significance of intervention outcome**

Clinical significance was assessed using the Reliable Change Index (RCI) method. RCI is calculated by dividing the difference between the pre- and post-intervention scores by the standard error of the difference between the two scores (Jacobson & Truax, 1991). The criterion for demonstrating clinically reliable change was when the RCI exceeded 1.96 standard deviations of the intervention group, indicating that a change of that magnitude would not be expected due to the unreliability of the measure. The percentage of cases (for the intervention group only) demonstrating clinically reliable improvement at the 95% and 99% confidence levels on each of the outcomes measures are presented in Table 5. Most salient are improvements on the SDQ Total Difficulties,

family hardiness and family problem-solving communication, and reductions in perceived intensity of daily stress for siblings and perceived stress for parents.

**Satisfaction with the intervention**

With respect to the *Sibstars'* content, all parents and 78% of siblings *agreed to strongly agreed* that the life skills covered were appropriate and useful. One parent stated,

*...we received valuable information and also refreshed and renewed our memories on lots of coping skills with problem behaviour and communicating as a family.*

Another parent said,

*This program was most beneficial as it helped me to focus and devote time to the elder sibling, amidst a busy life and routine.*

**Table 5. Number and percentage of cases in the Intervention group (n=12) demonstrating clinically reliable improvement at the 95% and 99% confidence levels**

Measure	95% Confidence 1.96SD		99% Confidence 2.58SD		Total Reliable Improvement	
	n	(%)	n	(%)	n	%
<b>Sibling adjustment</b>						
Total difficulties	5	(41.7)	5	(41.7)	10	(83.3)
Emotional symptoms	1	(8.3)	-	-	1	(8.3)
Conduct problems	-	-	-	-	-	-
Hyperactivity	-	-	-	-	-	-
Peer problems	-	-	-	-	-	-
Pro-social behaviour	1	(8.3)	2	(16.7)	3	(25.0)
<b>Sibling daily events</b>						
Hassles – Frequency	1	(8.3)	1	(8.3)	2	(16.7)
Hassles – Intensity	1	(8.3)	2	(16.7)	3	(25.0)
Uplifts – Frequency	-	-	1	(8.3)	1	(8.3)
Uplifts – Intensity	1	(8.3)	-	-	1	(8.3)
<b>Sibling coping</b>						
Social Support	-	-	-	-	-	-
Problem-solving	-	-	-	-	-	-
Distancing	-	-	1	(8.3)	1	(8.33)
Internalising	-	-	1	(8.3)	1	(8.3)
Externalising	2	(16.7)	-	-	2	(16.7)
<b>Parent factors</b>						
Perceived stress	3	(25.0)	-	-	3	(25.0)
Parenting behaviour	1	(8.3)	1	(8.3)	2	(16.7)
<b>Family resilience factors</b>						
Family problem-solving communication	-	-	2	(16.7)	2	(16.7)
Family hardiness	-	-	2	(16.7)	2	(16.7)
Family time & routines	-	-	1	(8.3)	1	(8.3)

While several siblings indicated that the program was highly acceptable, others made suggestions for program changes, including catering for different ages with different activities.

In regards to the intervention strategies and delivery, the majority of participants *agreed* to *strongly agreed* that the written information and practice activities (parents, 94.2%; siblings, 72.3%), and telephone support (parents, 100%; siblings, 72.3%) were useful in helping them to use the life skills discussed in *Sibstars*. One parent stated that,

*the booklets gave us another avenue for discussion,*  
while another stated,

*...the most valuable part was the phone calls as follow-up.*

Although telephone support was seen as valuable, a parent and two siblings indicated that they would like to meet other parents and siblings of children with a disability or illness. One parent indicated the program could be improved by facilitating greater interaction between the sibling and parent components of the intervention.

With respect to outcomes of their participation in *Sibstars*, the majority of parents *agreed* to *strongly agreed* that they were more confident about managing stress (81.4%), helping others in their family manage stress (76.4%), supporting siblings (100%), managing daily routines (82.4%), parenting (88.2%), family communication (76.4%) and problem-solving (76.4%). The majority of siblings *agreed* to *strongly agreed* that *Sibstars* helped them deal with stress (83.3%), and deal with problems (88.9%), while approximately a third of siblings indicated that it helped them get along better with others (32.4%), helped their family get along better (33.4%) and deal with problems (38.9%). One parent reported benefits for the sibling, but not for overall parent and family functioning:

*I felt the program benefited the sibling involved. She liked the phone conversations and readily worked through the books. There was little new in it for me as a parent but it reminded me to use certain strategies. Most of our problems and stresses are still the same, and rather too complex for a program like this to really impact upon.*

For other parents the program was perceived to strengthen family functioning and offer new ways of approaching family issues:

*It was great to participate in this program. I gained a lot of different ways to deal with my family.*

## Discussion

The current study demonstrates preliminary support for a family-based psycho-educational intervention based on cognitive-behavioural principles to improve outcomes for siblings. The intervention was particularly effective in strengthening siblings' emotional functioning, which is important as research indicates that enduring internalising behaviour problems are prevalent among siblings (e.g., Houtzager et al., 1999; Rossiter & Sharpe, 2001; Sharpe & Rossiter, 2002). Although the intervention had limited impact on other domains of sibling adjustment (i.e., conduct problems, hyperactivity and peer problems), it is worth noting that pre-test means for these areas of functioning were well within the normal range, and were not specifically targeted for intervention.

It is interesting to note that while sibling reports of the *frequency* of daily hassles related to their brother or sister with a disability/illness (e.g., behaviour difficulties, having to do things for their sibling, and embarrassing situations) did not change following intervention, there was a significant decrease in the perceived *intensity* of these hassles. *Sibstars* skills and strategies may be particularly useful in helping siblings to be less sensitive to, and/or manage their emotional reactions to stressful situations related to their brother or sister.

In regards to coping strategies, siblings who received the intervention reported significantly less use of distancing coping than siblings in the waitlist condition. Distancing is an avoidant coping strategy whereby siblings may pretend the stressful situation is not happening, distract themselves, or avoid dealing with it. While all forms of coping attempt to alleviate distress, avoidant coping can be ineffective in reducing distress and may even intensify it (Beresford, 1994). Studies show that children tend to use avoidant forms of coping when they perceive they have little control over stressful situations (Hardy, Power & Jaedicke, 1993; Kliewer, 1991). It is possible that *Sibstars* helps siblings

to believe they do have greater control of stressful situations, and they can do something to manage how they feel about them.

Given that *Sibstars* focuses specifically on proactive coping strategies, it was surprising that no intervention effect for use of problem-solving or social support was found. Whilst revision of the program may be necessary, it is also possible that other factors may mediate siblings' use of these coping strategies such as parent and family coping behaviours, as well as availability of and perceived need for social support. Furthermore, despite the lack of statistical significance, a clinically significant decrease in use of internalising, externalising and distancing coping was noted for several siblings. Taken together, these findings suggest that *Sibstars* may be more effective in decreasing ineffective forms of coping rather than strengthening proactive forms of coping.

With respect to parent and family outcomes, the only significant finding was that families in the intervention group reported an increase in routines and the time spent together as a family. This is an important finding considering reports that siblings from families with consistent and regular family routines have fewer adjustment difficulties than siblings from families with fewer routines (Giallo & Gavidia-Payne, 2006). Family activities and predictable routines may allow siblings to share positive experiences and receive social support.

Results pertaining to clinical significance of the intervention highlight the wide variability in outcomes for siblings, parents and the overall family. The level of support offered by *Sibstars* may be limited for some families, particularly those with more complex issues, such as parental mental health difficulties. Future work to identify the characteristics of siblings and parents who are likely to benefit most from this form of intervention is necessary.

Finally, participants reported moderate to high satisfaction with *Sibstars*, and offered valuable feedback for further program development. Several participants indicated that *Sibstars* was acceptable in its current form. Parents noted the benefits of the flexibility in reading the written information at their leisure and arranging telephone support at times most convenient to

them. These modes of delivery may be particularly useful for families who find it difficult to access services due to transportation, lack of child minding support and related issues, or reside in rural or remote areas. Nonetheless, suggested areas for further development include a group delivery approach to meet other siblings and parents facing similar situations, and the inclusion of activities that promote greater discussion and interaction between siblings and parents. Opportunities for parents and siblings to work through the program together may lead to reinforcement of siblings' effective coping responses and greater generalisation of the skills and strategies into daily life.

### *Limitations and strengths of the research*

There are several strengths of the research worth noting. First, the study used randomised controlled methodology to assess the intervention outcomes. The use of rigorous research methodology to evaluate sibling support is lacking, and this study is a step toward the development of evidence-based approaches to supporting siblings. Second, the clinical significance of the intervention was assessed. Although some group differences and pre- to post-test changes were not large enough to be statistically significant, meaningful improvements in some areas of functioning for individual siblings, parents and families were reported. Third, the treatment acceptability of the intervention was assessed. This is important as evidence suggests that interventions viewed as acceptable are associated with greater adherence by participants (Tarnowski & Simonian, 1992), and are more likely to be endorsed by professionals than are interventions with low acceptability (Foster & Mash, 1999).

Despite these strengths, there are several limitations. Although intended to be a pilot evaluation, the sample size was small, limiting statistical power to detect small effects. Replication of the study with a larger sample is necessary. Furthermore, although a non-categorical approach to recruitment was adopted and steps were taken to ensure that the intervention and waitlist groups were equivalent on disability/illness and socio-demographic characteristics, recruitment of siblings of children with a particular condition and a narrower age group is worth considering. During

program delivery, it was evident that the depth to which siblings understood the intervention content, and the nature of the sibling issues discussed with both siblings and parents, varied depending upon the age of the sibling. Although the intervention content was presented flexibly to be responsive to developmental needs of children aged 8-16 years, future research is needed to determine whether the intervention is more effective for siblings at certain ages.

Furthermore, it is not possible to determine which intervention components (i.e., sibling or parent components, written information, telephone support) or a combination of these, are responsible for, or most effective in facilitating the intervention outcomes. Systematically trialing different aspects of the program would also provide an opportunity to identify the characteristics of siblings and parents who may benefit most from particular modes of delivery and levels of assistance. For instance, families experiencing significant stress may require a high level of support and individual face-to-face assistance, while others who are managing well may benefit from written information with telephone support. This research would provide information to assist in the development of flexible models of service provision based on specific needs of families.

Finally, follow-up data would indicate whether the changes in functioning were maintained over time. A short-term six week program such as *Sibstars* may be too short for participants to make significant changes in individual and family functioning. A longer period may be required for the skills and concepts introduced in the program to be consolidated and generalised to daily life.

## Conclusions

The current research is a first attempt to assess the effectiveness of *Sibstars*, a family-based intervention for siblings of children with a disability or chronic illness. The results are promising and directly relevant to professionals who work with families of children with a disability or chronic illness. Support is provided for a skill-based cognitive-behavioural approach to promoting sibling coping and adjustment within the context of the overall family environment by also addressing parent and

family functioning. The study also reveals that interventions which combine written information and telephone support are acceptable to siblings and parents. These findings reinforce the need for flexible delivery of supports to meet the needs of siblings and parents. While preliminary in nature, this pilot evaluation of *Sibstars* is seen as a critical step toward the development of evidenced based interventions for siblings, and provides a platform for the further development and research of family-based approaches to supporting siblings and families.

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