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Abstract

This article reviews the literature on modifiable factors associated with mental health in siblings of children with chronic illness. Three clinical databases were searched. A total of 17 studies met the inclusion criteria. Several key themes emerged from the review. Better sibling mental health was associated with camp attendance, perceived parent/peer support, illness education and enhancing control through cognitive coping strategies and routine. Parental and sibling psychoeducation interventions and social support may enhance children's mental health when their sibling has a chronic illness.

Keywords

Chronic illnesses, mental health, resiliency, siblings

Introduction

Childhood chronic illness affects up to 15% of Australian families (<http://www.aihw.gov.au>). It is well established that managing a childhood chronic illness is a stressful experience (Gannoni and Shute, 2010; Wallander and Varni, 1998) for all family members, including well siblings. Long-term family exposure to stressful events, connected to the long-term management of their child's

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chronic illness, has been shown to compromise the mental health of the family, including the well sibling Wallander and Varni, 1998).

Mental health consequences of having a sibling with a chronic illness have been the focus of recent reviews (Barlow and Ellard, 2006; Packman et al., 2010). A 2002 meta-analysis suggested that compared to normative controls, siblings of children with a chronic illness experience more mental health difficulties, particularly internalising problems such as anxiety and depression (Sharpe and Rossiter, 2002). It is important to prevent negative impacts on mental health in childhood as it holds immediate implications for children's quality of life (QoL; Sawyer et al., 2001) and predicts future mental disorders (Kessler and Wang, 2008). An understanding of the modifiable risk and protective factors associated with mental health as well as the absence of mental disorder amongst siblings in families experiencing childhood chronic illness is clearly warranted.

To date, the literature reviews investigating determinants of sibling mental health have focused on intervention programs (Hancock, 2011; Hartling et al., 2010; Prchal and Landolt, 2009), childhood cancer (da Silva Pedro et al., 2008; Hancock, 2011; Packman et al., 2010; Prchal and Landolt, 2009) or explored predictors of mental health problems only as a secondary aim (Ross-Alaolmolki et al., 1995; Williams, 1997). No reviews have synthesised evidence across multiple study designs (i.e. cross-sectional, longitudinal and qualitative studies) and from different childhood chronic illness groups to identify consistent risk and protective factors for sibling mental health. The aim of this article is to synthesise the quantitative and qualitative literature from a variety of chronic illness groups to identify modifiable factors at the child level (e.g. coping strategies), parent level (e.g. emotional support) and family level (e.g. family stability) that could be targeted to improve mental health outcomes for siblings. 'Mental health' will be broadly defined to include measures of mental well-being, mental disorder as well as subclinical problems, such as adjustment difficulties. This article forms part of a larger literature review to inform a health promotion intervention entitled the Childhood Illness Resilience Program (ChIRP), which aims to support mental health, resilience and well-being amongst children with a chronic illness, their parents and siblings. As our objective was to identify a broad range of factors rather than develop a hierarchy of evidence, the review is a synthesis of current research rather than a critical analysis of the literature.

Method

Data sources and search strategy

Databases known to index psychosocial subject areas were selected in consultation with the library service of The Royal Children's Hospital. Ovid MEDLINE, Cinahl and PsycINFO electronic databases were searched in May 2012 for empirical studies investigating factors associated with mental health outcomes in siblings of children with chronic illness for the period of 1996 to 2012 (see search strategy Appendix A). Searches were conducted using the following subject headings for the *population* of interest: (1) 'sibling' (limited to 'infant (1–23 months)', 'preschool (2–5 years)', 'child (6–12 years)' or 'adolescent (13–18 years)') and (2) 'asthma', 'chronic illness', 'cystic fibrosis (CF)', 'diabetes', 'dermatitis' and 'neoplasms'. Search terms for *outcomes* were 'adjustment', 'adaptation, psychological', 'anxiety', 'coping', 'family relations', 'parenting', 'major depression', 'psychosocial support', 'resilience', 'self-efficacy' and 'social support'.

Study selection. Studies were included if they met the following criteria: (1) *type of studies:* intervention, longitudinal, cross-sectional or qualitative, (2) *types of participants:* children or

adolescents aged 0 to 18 years with a sibling diagnosed with a chronic illness (defined as a condition that has lasted or is expected to last at least six months) including but not limited to cancer, asthma, CF, dermatitis, eczema and type 1 diabetes, (3) *type of outcome*: standardised outcome measures (with the exception of qualitative studies) with self- or parent proxy report of child behaviour, mental health or adjustment and (4) *type of predictor*: an intervention, strategy or modifiable factor. Case studies and studies reported in a language other than English were excluded. As families of children with developmental disorders and chromosomal abnormalities are not a target of ChIRP, they will not be a focus of the current review.

Results

Seventeen studies met inclusion criteria (see Appendix A – flow diagram) and their characteristics are summarised in Table 1 and discussed briefly below. We then follow with a summary of factors associated with sibling mental health grouped into the following themes: group programs and social support; informational support; emotional support; coping strategies; and family functioning.

Description of studies

Of the studies reviewed, six were from the US (Alderfer and Hodges, 2010; Lobato and Kao, 2002; O'Haver et al., 2010; Packman et al., 2005; Sloper and While, 1996; Williams et al., 2003), two from Canada (Barrera et al., 2002, 2004) and three from each of Australia (Loos and Kelly, 2006; Sidhu et al., 2005, 2006), the United Kingdom (Gardner, 1998; Kiernan et al., 2004; Taylor et al., 2001) and the Netherlands (Houtzager et al., 2001, 2004, 2005).

Study designs

There were seven intervention studies, of which one was a randomized controlled trial (RCT; Williams et al., 2003). All interventions were group based, in the form of either therapy (Barrera et al., 2002; Houtzager et al., 2001; Lobato and Kao, 2002) or recreational camps (Kiernan et al., 2004; Packman et al., 2005; Sidhu et al., 2006; Williams et al., 2003) and thus provided opportunities for siblings to interact with peers. Descriptions of interventions in the selected studies varied considerably but common components were psychoeducation, sporting or camping-based activities and group discussions to encourage the expression of emotions. Two of the interventions also involved parents (Lobato and Kao, 2002; Williams et al., 2003). Of the other studies reviewed, one was longitudinal (Houtzager et al., 2004), six were cross-sectional (Alderfer and Hodges, 2010; Barrera et al., 2004; Houtzager et al., 2005; O'Haver et al., 2010; Sloper and While, 1996; Taylor et al., 2001) and three were qualitative (Gardner, 1998; Loos and Kelly, 2006; Sidhu et al., 2005).

Sample characteristics. The sample sizes varied from 9 (Sidhu et al., 2005) to 252 (Williams et al., 2003) siblings, with an age range from 4 to 18 years. A total of 10 studies focused on siblings of children with cancer, 1 on type 1 diabetes, 1 on CF and the remaining 5 included a range of diagnoses.

Factors associated with sibling mental health

Group programs and social support. Intervention programs showed consistent benefits for sibling mental health. Siblings who participated in recreational camps reported improvements in self-esteem

Table 1. Studies assessing factors associated with mental health in siblings of children with a chronic illness.

First author (year) and Title	Country	Sibling sample	Chronic illness	Predictors	Outcomes for sibling mental health
Intervention studies Sidhu et al. (2006)	Australia	n = 26 (12 boys). Aged 8 to 13 years	Cancer	Therapeutic peer support programme based on psychoeducation, activity participation, self-expressive and cognitive behaviour therapy principles.	Post-intervention, siblings reported decreased anxiety, improved social competence, greater social acceptance and reductions in fear of disease
Packman et al. (2005)	US	n = 77 (35 boys). Aged 6 to 17 years.	Cancer	One-week camp involving sibling discussion groups and sharing tips on coping with sporting/camping activities.	Health-related QoL improved significantly at 12 to 16 weeks post camp by child self-report but not by parent proxy report; parents and children reported positive impacts of the camp on satisfaction surveys
Williams et al. (2003)	US	n = 79 (41 boys; full intervention), n = 71 (29 boys; partial intervention) and n = 102 (56 boys; waitlist control). Aged 7 to 15 years.	Mixed diagnoses and disability	Full intervention: structured teaching about the illness and psychosocial sessions at a five-day residential camp; partial intervention: camp only.	Full intervention group showed improvements in sibling knowledge about illness, mood and behaviour problems; partial intervention was associated with improvement in self-esteem and social support. Treatment gains were maintained at 12-month follow-up.
Kiernan et al. (2004)	UK	n = 23. Aged 7 to 16 years.	Mixed diagnoses	International summer therapeutic recreational program for children with life-threatening illnesses and their siblings.	Post-intervention, QoL improved for children but not teens, affect and physical symptoms did not change and self-esteem declined but then rose at six-month follow-up.
Lobato and Kao (2002)	US	n = 54 (24 boys). Aged 8 to 13 years.	Mixed diagnoses and disabilities	Group intervention aimed at increasing understanding of chronic illness and enhancing connectedness to other children in similar family circumstances	Post-intervention, sibling knowledge of the illness and connectedness increased; self-reported negative adjustment to the illness and parent-reported behaviour problems decreased
Barrera et al. (2002)	Canada	n = 17 (11 male). Aged 6 to 17 years.	Cancer	Group cognitive behaviour therapy intervention program aimed at addressing emotional and behavioural problems.	Post-intervention, self-reported anxiety and depression decreased, as well as behaviour problems and cancer-related fear.
Houtzager et al. (2001)	Netherlands	n = 24 (9 boys). Aged 7 to 18 years.	Cancer	Group program aimed at reducing anxiety by enhancing siblings' sense of control through provision of information and social support.	Post-intervention, siblings reported a reduction in self-reported anxiety.
Prospective studies Houtzager et al. (2004)	Netherlands	n = 83 (37 boys). Aged 7 to 19 years.	Cancer	Sibling coping, family functioning and parent psychological distress.	High levels of family adaptability predicted greater sibling adjustment problems; incorporating stability and change promoted better sibling outcomes; parent distress was not related to sibling adjustment difficulties; siblings who used predictive coping felt less anxious, insecure and lonely.

(continued)

Table 1. (continued)

First author (year) and Title	Country	Sibling sample	Chronic illness	Predictors	Outcomes for sibling mental health
Cross-sectional studies O'Haver et al. (2010)	US	n = 40 (23 boys). Aged 8 to 18 years.	CF	Parent's perceived stress and social support; information provided to the well sibling about CF; parents' presence as caretaker to the well sibling when child with CF is hospitalised.	Parents with higher stress and less social support had adolescents with more behaviour problems; parent as caretaker was not associated with behaviour problems; discussions about CF with the medical team predicted fewer negative sibling behaviours.
Barrera et al. (2004)	Canada	n = 47 referred for behaviour problems and n = 25 nonreferred (30 boys). Aged 6 to 18 years.	Cancer	Sibling social support.	High social support predicted fewer symptoms of depression, anxiety and behaviour problems than low support.
Alderfer and Hodges (2010)	US	n = 161 (84 boys). Aged 8 to 18 years.	Cancer	Sibling social support.	Friends were the most important source of support; support from parents, classmates and others was associated with less depression but unrelated to anxiety or traumatic stress; support from parents and school was associated with fewer behaviour problems.
Sloper and White (1996)	US	n = 99 (48 boys). Aged 8 to 16 years.	Cancer	Sibling social support, self-esteem, appraisal of illness experiences, coping strategies, information/communication about the illness; parent psychological distress, parent social support.	Adjustment problems were related to higher degree of disruption of family life, sibling's perceptions of negative interpersonal effects of the illness, mother's dissatisfaction with social support and sibling's perception of parental support but were not related to sibling perception of support from teachers/friends or to parent distress
Taylor et al. (2001)	UK	n = 62 (33 boys). Aged 8 to 16 years.	Mixed diagnoses	Accuracy of parents' reports of sibling attitudes and perceptions of the illness.	Parental awareness of well sibling's perceptions and attitudes was associated with less psychopathology; negative perceptions and attitudes about the illness (of mother and siblings) predicted more emotional problems.
Houtzager et al (2005)*	Netherlands	n = 83 (37 boys). Aged 7 to 18 years.	Cancer	Sibling coping.	Predictive control was associated with better QoL (cognitive and emotional) and interpretive control was related to lower QoL (emotional).
Qualitative studies	Australia	n = 9 parents (1 father) of well siblings aged 4 to 16 years.	Cancer	Focus group investigating parent perceptions of the needs of well siblings and helpful supports.	Parents perceived sibling camps as helpful for providing siblings with a place of their own, information about the illness and peer support.

(continued)

Table 1. (continued)

First author (year) and Title	Country	Sibling sample	Chronic illness	Predictors	Outcomes for sibling mental health
Loos and Kelly (2006)	Australia	n = 16. Aged 6 to 14 years.	T1D	Semi-structured interview with parents and siblings exploring social well-being.	Parents would like siblings to be given developmentally appropriate education; siblings enjoy participating in diabetes cares; siblings feel angry when daily routines are interrupted by procedures and when parental time is taken away.
Gardner (1998)	UK	n = 10 (5 boys). Aged 11 to 15 years.	Mixed diagnoses	Semi-structured interviews into sibling appraisals of stressful events and factors exacerbating or decreasing stress.	Factors decreasing stress: affection, having time with a parent and having questions answered, perceptions that parents are reacting favourably to their concerns and perceptions of control. Factors exacerbating stress: catastrophising thoughts and avoidance strategies.

QoL: quality of life; CF: cystic fibrosis.

(Sidhu et al., 2006; Williams et al., 2003), particularly over the longer term (Kiernan et al., 2004), in QoL (Kiernan et al., 2004; Packman et al., 2005), as well as reduced anxiety and fear of the disease (Sidhu et al., 2006). Siblings who participated in therapeutic support groups had declines in parent-reported behaviour problems (Barrera et al., 2002; Lobato and Kao, 2002), self-reported anxiety (Barrera et al., 2002; Houtzager et al., 2001) and less negative adjustment to the illness (Lobato and Kao, 2002). Results from the intervention study with the largest sample size ($n = 54$) suggested that improvements in externalising problems were maintained at three-month follow-up (Lobato and Kao, 2002), lending support to the benefits of these programs. However, conclusions were limited by small sample sizes in several studies (Barrera et al., 2002; Houtzager et al., 2001; Kiernan et al., 2004; Sidhu et al., 2006), short follow-ups (Barrera et al., 2002; Houtzager et al., 2001; Packman et al., 2005; Sidhu et al., 2006) and the lack of a comparison group in all but one study (Williams et al., 2003).

Both the sibling camps and group therapy interventions improved outcomes related to social functioning, social acceptance and social competence (Lobato and Kao, 2002; Sidhu et al., 2006; Packman et al., 2005; Williams et al., 2003). Social support is a strong predictor of resilience in both the general and chronic illness populations (Kidger et al., 2012; Stewart and Yuen, 2011) and thus could account for the wider mental health benefits associated with these group interventions. Evidence from cross-sectional and qualitative studies also suggested that social support, particularly from friends (Alderfer and Hodges, 2010), may be an important modifiable factor in protecting the mental health of siblings. Siblings of children with cancer who reported more social support endorsed fewer symptoms of anxiety (Barrera et al., 2004), depression (Alderfer and Hodges, 2010; Barrera et al., 2004) and behaviour problems (Barrera et al., 2004) than those with less social support. In a qualitative study, parents reported that 'meet[ing] siblings in a similar position' was one of the main reasons for attending the camp (Sidhu et al., 2005).

Only one study explored aspects of the intervention that were responsible for enhancing sibling mental health, by comparing the effects of sibling camps with and without therapeutic and educational sessions (Williams et al., 2003). Both programs improved self-esteem and social connection; however, the therapeutic intervention had added benefit for siblings' behaviour, mood and knowledge about illness (Williams et al., 2003). This implied that factors such as information and emotional support were also important for enhancing sibling mental health.

Informational support. The benefits of informational support were highlighted in a study of siblings of children with CF, whereby parents reported fewer negative behaviours when there had been a discussion about CF with the medical team (O'Haver et al., 2010). Qualitative research revealed that siblings of children with cancer find it helpful to have their questions about the illness answered (Gardner, 1998) and value camps for the opportunities they provided to clarify the diagnosis and cause of the illness (Sidhu et al., 2005). Parents also expressed a preference for the well sibling to be included in education, although noted that children appeared bored when it was not developmentally appropriate (Loos and Kelly, 2006). Another study reported no relationships between communication about the illness and sibling adjustment (Sloper and While, 1996), and their measure of informational support, however, had low internal reliability.

Emotional support. Emotional support, particularly from parents, appears to play a protective role for the mental health of siblings in families with a chronically ill child. In a cross-sectional study, siblings who perceived good parental support had fewer behaviour problems (Sloper and While, 1996). Similarly, siblings had fewer emotional and behavioural difficulties when their parents were aware of their perceptions and attitudes about the chronic illness (Taylor et al., 2001), suggesting

that this awareness may be the mechanism for provision of emotional support. In semi-structured interviews, siblings identified affection and having time with the parent as helpful (Gardner, 1998). However, this may be more difficult for parents who are experiencing greater levels of psychological distress or low support. Cross-sectional studies reported positive associations between parent-reported sibling behaviour problems and maternal emotional distress (Taylor et al., 2001) as well as maternal dissatisfaction with social support (Sloper and While, 1996).

Coping strategies. The coping strategies employed by children to deal with the challenges of having a sibling with a chronic illness were associated with different mental health outcomes. Children who desired to understand the meaning of the illness (referred to as interpretive control) experienced fewer positive emotions (Houtzager et al., 2005) as well as more anxiety and insecurity (Houtzager et al., 2004). These children may be more likely to expose themselves to anxiety-provoking information that could escalate fears. Catastrophic thinking about the chronic illness was associated with negative emotions in siblings within a qualitative study (Gardner, 1998). However, given that avoidance strategies (e.g. ignoring and denial) were also unhelpful in times of heightened stress (Gardner, 1998), it is possible that siblings may benefit from understanding the reality of the chronic illness while having opportunities to discuss concerns about new information.

Siblings may be particularly vulnerable to feelings of helplessness when a family is caring for a chronically ill child and may therefore rely on certain coping strategies to gain a sense of control. Siblings who employed predictive control, referring to efforts aimed at maintaining a positive outlook on the illness (i.e. remained optimistic), adjusted more favourably and reported higher cognitive and emotional QoL (Houtzager et al., 2005). Prospectively, predictive control was not associated with QoL but did predict less sibling anxiety, insecurity and loneliness (Houtzager et al., 2004). On the other hand, siblings who relied more on the expertise of the medical specialist (vicarious control) reported more anxiety (Houtzager et al., 2004). The importance of perceived control also emerged from the qualitative research (Gardner, 1998). Other sibling coping strategies such as distraction, cognitive restructuring and problem-solving were not significantly associated with parent proxy-reported child adjustment problems within a cross-sectional study (Sloper and While, 1996).

Family functioning. Family-level factors were also associated with mental health outcomes in siblings. Greater disruption to family life due to illness (as indicated by the number of nights the ill child spent in hospital) was associated with adjustment problems among siblings of children with cancer (Sloper and While, 1996). In another study, there was no relationship between sibling adjustment and the presence of the parent as caretaker for the sibling during the hospitalisations for the child with CF (O'Haver et al., 2010), suggesting that the negative effects of disruption may be more strongly related to *perceptions* of parental neglect rather than the actual number of days of parental absence. In line with this view, siblings with more negative perceptions and attitudes towards the illness, such as perceived loss of attention from parents, demonstrated poorer mental health (Sloper and While, 1996; Taylor et al., 2001). Sibling interviews have verified the emotional impact of disruption to family routines and also suggest that siblings enjoy being included in the care of the chronically ill child (Loos and Kelly, 2006).

A longitudinal study with a relatively large sample size highlighted the importance of families finding a balance between structure and adaptability. Siblings in chaotic families with extreme levels of adaptability (i.e. families constantly changing the power structure, role relations and relationship rules in reactions to distress) self-reported more problems of behaviour, emotion and QoL. On the

other hand, siblings within families that incorporated stability and change reported better outcomes (Houtzager et al., 2004).

Discussion

This review provides a synthesis of evidence for associations between modifiable factors and sibling mental health in the context of childhood chronic illness. Several recurring factors emerged as did many gaps and methodological weakness in the literature. Siblings of children with chronic illness should be encouraged to attend group-based support programs, such as recreational camps, as they appear to be protective of poor mental health outcomes (Barrera et al., 2002; Houtzager et al., 2001; Kiernan et al., 2004; Lobato and Kao, 2002; Packman et al., 2005; Sidhu et al., 2006; Williams et al., 2003). Benefits may be attributable to the supportive peer environment that reduces sibling isolation and enables validation of their experience (Alderfer and Hodges, 2010; Barrera et al., 2004).

Providing healthy siblings with knowledge about the chronic illness and its treatment appears to reduce anxiety (Houtzager et al., 2001). Camps and therapeutic groups may provide a safe place for delivering developmentally appropriate medical information to this population. However, parents can play an important role by being available to discuss questions and concerns following sibling's exposure to new information about the chronic illness. Parents can also provide frequent opportunities for siblings to spend time with friends as they are a valuable source of social support (Alderfer and Hodges, 2010).

A sense of control and predictability appears protective for the mental health of siblings of children with a chronic illness (Gardner, 1998; Houtzager et al., 2004, 2005). Parents and health professionals should be encouraged to emphasise aspects of the situation that remain within the family's control to avoid portraying a situation whereby control has been surrendered to the medical profession. In times of stress and when medical regimens impose on daily life, families may benefit by maintaining some stability (Loos and Kelly, 2006; Sloper and While, 1996). This may involve efforts to minimise disruption to routines where possible and encouraging sibling involvement in medical regimes.

Parents are instrumental in providing emotional support to protect the well sibling. To best support their children, it is vital for parents to look after their own mental health by engaging in self-care, enlisting support and accessing mental health services if necessary (Lindstrom et al., 2010). It is also helpful for parents to be aware of their healthy child's thoughts and feelings about the chronic illness (Taylor et al., 2001). Therefore, they could elicit the sibling's perceptions about the chronic illness and its impact on the family so they can support them appropriately. These discussions may also provide opportunities for parents to identify and modify inaccurate or unhelpful beliefs about the illness, which may be causing distress to the well sibling (Gardner, 1998). Thus, by allocating time for the well sibling, parents can explore their child's emotional experience while also maintaining a sense of normality through everyday activities such as transportation to after-school activities (Murray, 2001).

Finally, family-level factors that promote good sibling mental health include open communication within the family (da Silva Pedro et al., 2008), consistent family routines (O' Brien et al., 2009), mutual support and collaboration and balancing the needs of the sick child with those of the rest of the family (Bellin and Kovacs, 2006).

Strengths and limitations

We searched the major databases for quantitative and qualitative studies conducted across a variety of chronic illnesses. We did not formally appraise study quality and chose to include varied study

designs with the exception of case studies. However, given that we identified only one RCT, inclusion of other study designs has allowed us to synthesise information from a variety of countries and illnesses and to identify emerging trends.

Future research

Despite RCTs representing the ‘gold standard’ approach for the evaluation of interventions, we found only one such trial. Future research should include RCTs of interventions aimed at improving modifiable factors, preferably with economic evaluations and long-term follow-ups (i.e. >12 months), to determine benefits over time. Interventions need to be well described, allowing for replication and comparability.

The sample sizes of studies tended to be small, meaning that they may lack sufficient power to detect change. The majority of studies were focused on siblings of children with cancer, so future studies should include siblings of children with a variety of chronic illnesses to ensure generalizability of findings. The age ranges of siblings varied, commonly spanning childhood and late adolescence. This may have diluted any associations found, as the factors influencing mental health are likely to differ greatly across developmental stages.

A wide array of outcome measures and instruments made comparisons and meta-analyses difficult. For example, QoL was assessed using three different instruments. Finally, the reliance of some studies on parent proxy-reported sibling mental health may be problematic (O’Haver et al., 2010; Sloper and While, 1996; Taylor et al., 2001), as parents tend to estimate intervention effects less positively and perceive their children’s mental health as poorer relative to child self-report (Prchal and Landolt, 2009).

There is an urgent need for more RCTs to evaluate mental health promotion strategies and consistency in measures to enable data pooling and meta-analysis. Future research could bolster cross-sectional findings by confirming a longitudinal relationship between social support and better mental health outcomes for siblings of chronically ill children. Areas such as the impact of the parent relationship and support from extended family on sibling well-being remain to be explored, as does the use of the Internet and other multimedia approaches to enhance sibling social support and mental health. The latter could circumvent the problems of siblings in rural and remote areas accessing peer support groups.

Implications for practitioners

Health professionals can raise parental awareness of practical strategies and local support groups to minimise the impact of childhood chronic illness on the well sibling. The development of psychoeducational resources, such as booklets, could make this information readily accessible and empower families by increasing their sense of control over their situation. These findings can also inform the development of health promotion interventions, such as ChIRP, to enhance family resilience and well-being when a child has a chronic illness (<http://www.himh.org.au/home/our-work/current-programs/childrens-illness-resilience-program>).

Appendix A

Search strategy: Medline (Ovid software interface). 1996–May 2012.

Note: Equivalent MESH terms run for PsycINFO and CINAHL

1. Sibling
2. Asthma or chronic illness or diabetes or cystic fibrosis or dermatitis or neoplasms
3. Adjustment or adaptation or psychological or anxiety or coping or family relations or major depression or parenting or psychosocial support or resilience or self-efficacy or social support
4. 1 and 2 and 3
5. Limit 1996–current
6. Limit to (infant (1–23 months) or preschool (2–5 years) or child (6–12 years) or adolescent (13–18 years)).

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