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<th><strong>Title</strong></th>
<th>Factors related to the adjustment of siblings following sudden infant death</th>
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<tbody>
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<td>Coughlan, Barbara; Carr, Alan; Fitzgerald, Michael</td>
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CHAPTER 7

FACTORS RELATED TO THE ADJUSTMENT OF SIBLINGS FOLLOWING SUDDEN INFANT DEATH

Barbara Coughlan, Alan Carr & Michael Fitzgerald

INTRODUCTION

Sudden Infant Death Syndrome (SIDS) commonly known as Cot Death or Crib Death refers to "the sudden death of an infant or young child which is unexpected by history and in which a thorough post-mortem examination fails to demonstrate an adequate cause of death". (SIDS Global Strategy, 1994). SIDS is a major public health problem in Ireland and elsewhere (Radic, Griffin & Cahalane, 1983; Arneil, Gibson, McIntosh et al, 1985). Four in every ten infant deaths in Ireland are due to SIDS and the SIDS mortality rate in 1993 was 0.7 per 1000 live births (ISIDA, 1993).

References to sudden and unexpected infant death occur in the Old Testament and Roman records, and in medical and legal literature of the 12th and 13th centuries (Guntheroth, 1989). Modern medical interest in the problem began in the late 19th century and since the 1950's research in the fields of pathology, physiology and epidemiology has attempted to generate hypotheses about potential vulnerability factors with a view to prevention (Limerick 1992). Until etiological research can insure prevention, the problem of understanding and dealing with the aftermath of SIDS deserves attention.

Only a handful of studies have addressed the psychological sequelae of SIDS for parents (e.g, Blueglass, 1981; Dyregrov & Mattiesen, 1987; Feeley & Gottleib, 1988-1989; Price, Carter, Sheldon & Bendell, 1985; Ostfeld, Ryan,
Hiatt & Hegyi, 1993; Williams & Nikolaisen, 1982; Mandell, McAnulty & Reece, 1980) and siblings (e.g., Cornwell, Nurcombe & Stevens, 1977; Defrain & Ernst, 1978; Hutton & Bradley, 1994; Mandell, McClain, & Reece, 1988; Powell, 1991).

These studies have consistently found that SIDS has severe and prolonged psychological effects on parents and siblings. For parents it leads to alterations in mood, cognition and behaviour associated with grief processes. These include sadness, guilt, anger, anxiety, hallucinations of the deceased child, concentration problems and difficulties maintaining usual routines at work and at home. For example, Dyregrov and Mattiesen (1987) investigated grief reactions in parents relating to three kinds of infant death (stillbirth, neonatal death and SIDS) between one and four years after the death. They found higher levels of disturbance, especially anxiety and intrusive thoughts and prolonged disturbance in the parents of babies dying from SIDS than in parents from the other two groups. Cases of parental psychiatric morbidity following SIDS have also been reported (Blueglass, 1981).

Both internalizing and externalizing behavioural problems have been found in siblings following SIDS. Depression, separation anxiety, clinging, bedwetting, nightmares, somatic complaints, school problems, and destructiveness are among the more commonly reported difficulties (Cornwell, Nurcombe & Stevens, 1977; Defrain & Ernst, 1978; Hutton & Bradley, 1994; Mandell, McClain, & Reece, 1988; Powell, 1991).

Results from a number of studies suggest that marital, parent-child and peer relationships may deteriorate following SIDS. For example, Powell (1991) found that over 50% of the families in her study showed marital strain and Hutton and Bradley (1994) reported that compared with matched controls, SIDS-siblings family and peer relationships were characterized by more aggression and social withdrawal.

Results of available studies suggest that there is considerable variability in the rate and pattern of recovery for parents and siblings following SIDS. The
Overall trend is for the initial crisis to be associated with serious disruption and difficulties and that over a period this subsides. Improvement rarely follows a smooth and predictable course. Lapses into profound grief on both predictable occasions (such as anniversaries) and unpredictable occasions are common. Defrain and Ernst (1978) found that families required an average of 8.3 months to regain the level of family organization present before the death. Price, Carter, Sheldon and Bendell (1985) reported in their study of 73 SIDS-bereaved mothers, that grief symptoms persisted in the majority of mothers interviewed for at least three years after the death of a baby. Powell (1991) in a retrospective study of parents' perceptions of their surviving children's responses to SIDS found a combination of symptoms such as seeking parental affection, separation anxiety, fear of being alone and incessant curiosity about death for up to 3 years in siblings.

A ubiquitous finding is the variability in siblings' responses to SIDS. While it appears that many SIDS-siblings, develop severe and prolonged behavioural difficulties and relationship problems, some do not. The overall objective of the present study was to identify psychosocial factors associated with adjustment of siblings to Sudden Infant Death Syndrome. The wider literature on grief in children suggests that variability in children's grief reactions to losses of any type is due to variability in personal characteristics, parental characteristics and features of the child's family and social network (Corr & Balk, 1996; Walsh & McGoldrick, 1991; Smith & Pennell, 1996). Thus, the specific aim of this study was to pinpoint those psychological characteristics of siblings and parents and those psychosocial characteristics of families and their wider social networks which contribute significantly to the adjustment of siblings to SIDS. The identification of these factors may suggest hypotheses which explain why some siblings adjust to SIDS while others do not.

The five published studies on siblings' adjustment to sudden infant death identified in a literature search (Cornwell, Nurcombe & Stevens, 1977; Defrain & Ernst, 1978; Hutton & Bradley, 1994; Mandell, McClain & Reece, 1988; Powell,
1991) have all been small scale projects with the largest sample of SIDS-siblings
being 38 (Hutton & Bradley, 1994). With one exception in which the Child
Behaviour Checklist was used (Hutton & Bradley, 1994) none have employed
standardized assessment instruments. It was intended that the present study
would overcome these methodological weaknesses.

METHOD

Participants

Seventy mothers and 53 fathers of 119 children participated in this study.
Participants came from 72 families in which one child had died of sudden infant
death. The Irish Sudden Infant Death Association (ISIDA) issued invitations to
all 800 families from the Republic of Ireland on their confidential mailing list in
which a sudden infant death had occurred prior to 1993. It was estimated from
data presented in the National Sudden Infant Death Register 1993 Report that 568
of the 800 invited families had children alive at the time of the sudden infant
Table 7.1. Demographic characteristics.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Categories</th>
<th>Sample Statistics</th>
<th>Population Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of participants</td>
<td>Mothers</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fathers</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sibling</td>
<td>119</td>
<td></td>
</tr>
<tr>
<td>Sibling's gender</td>
<td>Male</td>
<td>55%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>45%</td>
<td></td>
</tr>
<tr>
<td>Sibling's age at interview</td>
<td>Mean</td>
<td>10.9 years</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>3.2 years</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Range</td>
<td>4-16 years</td>
<td></td>
</tr>
<tr>
<td>Sibling's age at time of SIDS</td>
<td>Mean</td>
<td>4.4 years</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>2.6 years</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Range</td>
<td>1-13 years</td>
<td></td>
</tr>
<tr>
<td>Time since SIDS</td>
<td>Mean</td>
<td>7.0 years</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>3.3 years</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&lt;5</td>
<td>50.7%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&gt;5</td>
<td>49.3%</td>
<td></td>
</tr>
<tr>
<td>Mothers' ages</td>
<td>Mean</td>
<td>37.9 years</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>5.1 years</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Range</td>
<td>20-49 years</td>
<td></td>
</tr>
<tr>
<td>Fathers' ages</td>
<td>Mean</td>
<td>50.5 years</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>6.4 years</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Range</td>
<td>28-58 years</td>
<td></td>
</tr>
<tr>
<td>Family structure</td>
<td>Intact nuclear</td>
<td>90%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Single parent, reconstituted or other</td>
<td>10%</td>
<td></td>
</tr>
<tr>
<td>Geographical region</td>
<td>Urban</td>
<td>31%</td>
<td>35.5%</td>
</tr>
<tr>
<td></td>
<td>Rural</td>
<td>69%</td>
<td>65.5%</td>
</tr>
<tr>
<td>SES</td>
<td>Class 1. Higher professional, farmer 200 acres</td>
<td>12.6%</td>
<td>9.9%</td>
</tr>
<tr>
<td></td>
<td>Class 2. Lower professional 100-199 acres</td>
<td>25.3%</td>
<td>14.1%</td>
</tr>
<tr>
<td></td>
<td>Class 3. Non-manual, farmer 50-99 acres</td>
<td>23.9%</td>
<td>15.5%</td>
</tr>
<tr>
<td></td>
<td>Class 4. Skilled manual, farmer 30-49 acres</td>
<td>28.2%</td>
<td>22.8%</td>
</tr>
<tr>
<td></td>
<td>Class 5. Semi-skilled, farmer 30 acres</td>
<td>5.6%</td>
<td>15.4%</td>
</tr>
<tr>
<td></td>
<td>Class 6. Unskilled</td>
<td>4.2%</td>
<td>10.2%</td>
</tr>
</tbody>
</table>


death. Of these 568 potential respondents, 139 families agreed to participate in the study. Families were included in the study if they contained children aged between 4 and 16 years at the time of the study and if these children had been alive at the time of the sudden infant death. Of the 139 families who agreed to participate in the study, 72 families met the criteria and completed data
collection procedures for at least one child and one parent. This group of 72 families represented 12.6% of the total pool of 568 potential cases. Demographic characteristics of these families are given in Table 7.1.

The distribution of participants across socio-economic groups in this study, with only 38% of cases coming from classes 4, 5 and 6, differs from that in the National Sudden Infant Death Register (ISIDA, 1993). In 1993, 57% of SIDS cases occurred in Class 4, 5, and 6. Thus, the results of this study may not be validly generalized to all families in which sudden infant death has occurred, but only to cases which meet the demographic profile set out in Table 7.1. From the table it is apparent that the average participant was an 11 year old boy or girl from a middle or upper-middle class intact family whose sibling had died a sudden death about 7 years before the study. Mothers who participated were in their late 30s and fathers were in the early 50s, with a third of families being rurally based and the rest living in urban settings.

**Instruments**

Siblings' adjustment was assessed with Achenbach's (1991) Child Behaviour Checklist (CBCL) and Kovacs' (1992) Children's Depression Inventory (CDI). Siblings' psychological characteristics were assessed with Form A of Battle's (1992) Culture Free Self-Esteem Inventory and Nowicki-Strickland's (1973) Locus of Control Scale. Psychological characteristics of parents were assessed with the 28 item version of the General Health Questionnaire (GHQ-28, Goldberg & Williams, 1988); the general scale of Form AD of Battle's (1992) Culture Free Self-esteem Inventory; and Lumpkin's (1985) Brief Locus of Control scale. Parental perceptions of aspects of family functioning and the family's social network were assessed with the McMaster Family Assessment Device (FAD, Kabacoff, Miller, Bishop, Epstein & Keitner, 1990); Schumm et al's (1986) Kansas Marital Satisfaction Scale (KMS) and Dahlem, Zimet & Walker's (1991) Multidimensional Scale of Perceived Social Support Scale. The
reliability and validity of all these instruments have been well established. A brief description of each instrument follows.

Sibling Adjustment

The Child Behaviour Checklist (CBCL). This is a 113 item inventory completed by parents (Achenbach, 1991). Items describe problem behaviours that children in the 4-16 year age bracket may exhibit. A three point response format is used for each item. For this study, T-scores for the total problem behaviour scale and both internalizing and externalizing behaviour problem scales were derived from parental responses to the checklist and included in statistical analyses. Cases obtaining T-scores above 63 on the total problem scale of the CBCL qualify for a DSM diagnosis in about 79% of cases usually of either an emotional disorder or a conduct disorder (Kasius, Ferdinand, van den Berg & Verhulst, 1997). On the CBCL, higher scores indicate greater symptomatology.

Children's Depression Inventory (CDI). The CDI is a 27-item self-rated symptom oriented scale, suitable for school age children and adolescents (Kovacs, 1992). The instrument quantifies a range of depressive symptoms including disturbed mood, hedonic capacity, vegetative functions, self-evaluation and interpersonal behaviours. Several items concern the consequences of depression in the contexts that are specifically relevant to children. Each CDI item consists of three choices, keyed 0, 1, 2, with higher scores indicating greater symptomatology. The child uses the options to rate the degree to which each statement describes him or her for the past two weeks. The CDI has internal consistency and test-retest reliabilities above .8 (Smucker, Craighead, Craighead & Green, 1986). The total depression score on the CDI has been shown to discriminate between youngsters with major depressive disorders and non-affective psychiatric controls and cases falling above a cut-off score of 63 on the scale typically qualify for a DSM diagnosis of major depression (Kovacs, 1992).


**Siblings' psychological characteristics**

**Culture Free Self-Esteem Inventory (CFSEI).** Form A of this instrument is a 30 item self-report inventory, with two response categories per item. The instrument yields a total score and scores on five subscales which assess general, social, academic and parental self-esteem and social desirability or response set. In the present study, only the total self-esteem score, for which there is reasonable reliability and validity data (Battle, 1992), was included in the statistical analyses. Higher scores indicated greater self-esteem.

**Nowicki-Strickland Locus of Control Scale.** This widely used and well validated scale was constructed as a children's version of Rotter's (1966) adult locus of control scale. The short form, used in the present study comprised 23 items describing reinforcement situations across interpersonal and motivational areas such as, affiliation, achievement and dependency (Nowicki-Strickland's, 1973). There were two response categories for each item. The higher scores were associated with an external orientation.

**Parental characteristics**

**General Health Questionnaire (GHQ-28).** For both mothers and fathers, psychological adjustment was evaluated using the 28 item version of the GHQ which yields an overall score and subscale scores for somatic symptoms, anxiety, social dysfunction and depression (Goldberg & Williams, 1988). For each item, four-point response formats were used and the 0,0,1,1 scoring method was employed to obtain total and subscale scores. Cases receiving scores of 5 or more following psychiatric interview typically receive a psychiatric diagnosis (Goldberg & Williams, 1988).
Culture Free Self-Esteem Inventory (CFSEI). For mothers and fathers self-esteem was assessed using the 15 item general self-esteem (SE) subscale from the AD form of the Battle Culture Free Self-esteem Inventory (Battle, 1992). True/False response formats were used for all items and raw scores were converted to T-scores using the adult norms in Battle's 1992 manual. Higher scores indicate greater self-esteem.

Brief Locus of Control Scale (BLCS). Parents' locus of control was evaluated with Lumpkin's (1985) Brief Locus of Control scale which contains six items from Rotter's original (1966) instrument. Three items relate to internal control, and three to external control. Five-point Likert response formats were used for each item. A higher score on the scale indicates a more internal locus of control. Lumpkin (1985) has shown that the scale has construct validity.

Parental perceptions of the family and social network

McMaster Family Assessment Device (FAD). Mothers' and fathers' perception of family functioning was evaluated using this 60 item inventory (Kabacoff, Miller, Bishop, Epstein & Keitner, 1990). It yields scores on the following seven subscales: problem-solving, communication, roles, affective responsiveness, affective involvement, behaviour control and general functioning. A four point Likert response format is used for responding to each item with responses ranging from strongly agree to strongly disagree. Subscale scores are based on subscale item totals divided by the number of items to which responses were given with higher scores indicating greater pathology. The FAD has been shown to discriminate between clinical and non-clinical families and clinically a cut-off score of 2 on the general functioning scale may be used to identify families with significant adjustment difficulties.

Kansas Marital Satisfaction Scale (KMS). This three item scale was used to
assess parents' perceptions of the quality of their marital relationship. The items assess satisfaction with the spouse, marriage and relationship and the scale as a whole, despite its brevity has been shown to correlate highly with other more extensive measures of marital satisfaction (Schumm, Paff-Bergen, Hatch et al, 1986).

**Multidimensional Scale of Perceived Social Support (MSPSS).** Perceived social support available to parents was evaluated with this 12 item inventory which assesses perceived social support from family, friends and significant others (Dahlem, Zimet & Walker, 1991). Responses to each item are given on seven point Likert scales and the instrument is scored so that higher scores indicate greater support.

**Procedure**

Participants were contacted by telephone or letter if no telephone contact number was available and an appointment was made for one of us (BC) to visit the family and collect data in a single session. In some instances participants were sent questionnaires by mail to complete prior to the researcher's visit and the data collection session was used to check for completeness and accuracy and to clarify ambiguous items. In other instances all data were collected in a structured interview format. In each family, each child over the age of 4 completed the CDI, Form A of the CFSEI, and the Nowicki-Strickland Locus of Control Scale. In each family one parent (usually the mother) completed the CBCL and a demographic questionnaire. Mothers and fathers each completed the GHQ-2; the general scale of the AD form of the CFSEI; the Brief Locus of Control Scale; the FAD; the KMS; and the MSPSS.
RESULTS

In presenting the results, descriptive statistics on the status of siblings and parents on psychological and psychosocial variables will first be presented. The results of two distinct but complementary sets of analyses will then be given which throw light on the correlates of adjustment of siblings to sudden infant death. The first set of results are from t-tests conducted to identify significant differences between siblings who scored above and below the clinical cut-off of the total problem scale of the CBCL on personal, parental and family characteristics. The second set of results are from a series of stepwise multiple regression analyses in which personal, parental and family characteristics which predict sibling adjustment following sudden infant death were identified.

Siblings' adjustment and characteristics

In Table 7.2, descriptive statistics for variables which are indices of siblings' psychological adjustment are presented along with those for variables which reflect broader psychological characteristics, specifically self-esteem and locus of control. Mean scores for the group of 119 siblings on the CBCL internalizing, externalizing and total problem behaviour scales; the CDI depression scale; and the CFSEI self-esteem scale were within the normal range. Normative data for the locus of control scale were unavailable.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>% in clinical range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indices of adjustment</td>
<td>CBCL total behaviour problems</td>
<td>52.6</td>
<td>11.9</td>
<td>18%</td>
</tr>
<tr>
<td></td>
<td>CBCL internalizing behaviour problems</td>
<td>54.3</td>
<td>11.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CBCL externalizing behaviour problems</td>
<td>50.8</td>
<td>10.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CDI depression</td>
<td>46.3</td>
<td>9.9</td>
<td>9%</td>
</tr>
</tbody>
</table>
On the total behaviour problem scale of the CBCL 18% of cases obtained scores which fell above the cut-off T-score of 63. This cut-off score of 63 falls at the 91st percentile, so in the general population, it would be expected that only 9% of cases would fall above this cut-off score. Thus, compared with children from the general population, twice as many of the SIDS-siblings in this study had significant behavioural problems.

On the CDI depression scale, 9% of cases fell above the cut-off T-score of 63. This cut-off score of 63 fell at the 91st percentile, so in the general population, it would be expected that exactly 9% of cases would fall above this cut-off score. Thus, there was no difference in depression levels, as assessed by the CDI, between children from the general population and the SIDS-siblings in this study.

**Parental characteristics and perception of the family and social network**

In Table 7.3, characteristics of 70 mothers and 53 fathers and their perceptions of family and social network characteristics are presented. Mean scores for mothers and fathers on the GHQ-28 and the CFSEI general self-esteem scale were within the normal range. Normative data for the locus of control scale were unavailable. For both self-esteem and locus of control, fathers obtained significantly higher scores than mothers. 21% of fathers' and 30% of mothers'

<table>
<thead>
<tr>
<th>Domain</th>
<th>Variable</th>
<th>Mothers (n=70)</th>
<th>Fathers (N=53)</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychological characteristics</td>
<td>GHQ</td>
<td>M 3.7</td>
<td>2.4</td>
<td>1.57</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>4.3</td>
<td>3.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Self-esteem</td>
<td>M 43.8</td>
<td>47.4</td>
<td>2.78**</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>8.7</td>
<td>6.9</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** CBCL=Child Behaviour Checklist. CDI=Childhood depression inventory. N=119. Clinical-cut-off t-score of 63 which falls at the 91st percentile was used to determine % in clinical range.
scores on the GHQ-28 fell above the cut-off score of 5. These rates did not differ significantly (Chi Square = 16.5, df=1, N=123), nor were they higher than those found in community studies (Cox, Blaxter, Buckle et al, 1987). On the general functioning scale of the FAD, mean scores for mothers and fathers were below 2 and therefore within the normal range. Mothers and fathers differed in their perception of the adequacy of family communication with fathers seeing it as more problematic compared with mothers.

Normative data for the KMS index of marital satisfaction and the MSPSS index of social support were unavailable, so conclusions about the status of the group studied with respect to the general population were not drawn. When mothers and fathers were compared on these variable, it was found that fathers reported greater marital satisfaction in comparison with mothers.

Table 7.4. Differences between clinical and non-clinical cases on personal, parental and family characteristics.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Variable</th>
<th>Clinical Group</th>
<th>Non-clinical Group</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal characteristics</td>
<td>Self-esteem</td>
<td>M 46.7</td>
<td>56.4</td>
<td>3.8 ***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD 12.5</td>
<td>9.3</td>
<td></td>
</tr>
</tbody>
</table>
Clinical vs non-clinical cases

It was noted above that fifteen SIDS-siblings (18% of the group of 119) obtained CBCL total problem scale T-scores above the clinical cut-off point of 63. To identify differences between these clinical cases and the remaining siblings who participated in the study the means of the two groups, for all variables, were compared using t-tests. Significant results from these analyses are presented in Table 7.4, where it may be seen that clinical cases had lower self-esteem and a more external locus of control. Their fathers and mothers also had lower self-esteem. Their mothers reported significantly worse psychological adjustment and the mean GHQ-28 score for the mothers of the clinical group (mean=7.1) was above the GHQ-28 clinical cut-off of 5. Compared with the non-clinical group, both mothers and fathers in the clinical group perceived family roles to be problematic. In addition mothers in this group perceived greater problems with family problem-solving, general family functioning, and marital satisfaction.

Predictors of sibling adjustment
To identify the most parsimonious set of variables predictive of sibling adjustment following sudden infant death, variables reflecting personal, parental and family characteristics were entered as potential predictors into a series of four stepwise multiple regression analyses. One such analysis was conducted for each of the following dependent variables: the CBCL internalizing scale; the CBCL externalizing scale; the CBCL total problem behaviour scale; and the CDI depression scale. In each of these analyses the following 14 independent or predictor variables were included: siblings' self-esteem, siblings' locus of control, mothers' GHQ, mothers' self-esteem, mothers' locus of control, mothers' FAD total score, mothers' marital satisfaction, mothers' perceived social support, fathers' GHQ, fathers' self-esteem, fathers' locus of control, fathers' FAD total score, fathers' marital satisfaction, and fathers' perceived social support.

Prior to conducting these regression analyses, all dependent and independent variables were examined through SPSS frequencies programme for accuracy of data entry, missing values and fit between their distribution and the assumptions of regression analysis. Missing data were accounted for in the regression analyses by inserting the group means for the missing values. This was accomplished through the mean substitution option in the SPSSX Programme. This procedure was chosen as it was a less conservative method than adding an overall mean and not as liberal as using prior knowledge (Tabachnick & Fidell, 1989). To reduce skewness in the distribution and improve normality and homoscedasticity of the residuals logarithmic transformations were used on a number of the dependent and independent variables. In these analyses there was a ratio of 8.5 cases for every independent variable, a ratio close to that of 1:10 recommended for multivariate analyses (Hair, Anderson, Tatham & Black, 1992).

Table 7.5. Predictors of siblings' adjustment following SIDS: Results of stepwise multiple regression analyses.
From Table 7.5 it may be seen that 3 of the 14 independent variables were identified as significant predictors of sibling adjustment in the multiple regression analyses. These were: siblings' self-esteem; siblings' locus of control; and mothers' GHQ. The following conclusions may be drawn from the results set out in Table 7.5, about the amount of variance accounted for by predictor variables in each of the four analyses. 27% of the variance in CBCL total problem behaviour scores was accounted for by three predictor variables: siblings' self-esteem (13%), mothers' GHQ (12%) and siblings' locus of control (2%). 20% of the variance in CBCL internalizing behaviour problem scores was accounted for by two predictor variables: siblings' self-esteem (10%) and mothers' GHQ (10%). 22% of the variance in CBCL internalizing behaviour problem scores was accounted for by three predictor variables: siblings' self esteem (11%), mothers' GHQ (10%) and siblings' locus of control (2%). 49% of the variance in CDI depression scores was accounted for by siblings' self-esteem scores. No other significant predictor variables were identified in this analysis.

The importance of the predictor variables identified in these four analyses may be assessed by noting the number of analyses in which they were
identified as significant predictors and the amount of variance they accounted for in these analyses. The siblings' self-esteem score was entered as the first predictor variable in all four analyses and accounted for between 10-13% of the variance for the three CBCL scales and 49% of the variance for the CDI depression scale. This is clearly the most important predictor of sibling adjustment. Mothers' GHQ score was entered as the second predictor variable in the three regression analyses involving CBCL scales. Across the three analyses the mothers' score on the GHQ accounted for 9-12% of the variance. This is the second most important predictor of sibling adjustment. Locus of control was entered as the third predictor variable in the regression analyses in which the CBCL total problem scale and CBCL internalizing behaviour problem scale were the dependent variables. In each of these analyses siblings' locus of control accounted for only 2% of the variance. Thus, siblings locus of control was the third most important predictor of sibling adjustment.

**DISCUSSION**

Before discussing the substantive findings of this study, some comments on the methodological limitations which constrain the generalizability of its findings are in order. This was a study of a non-representative self-selected group of siblings and parents from families in which SIDS had occurred. Cases from higher socio-economic groups were over-represented. Thus, results from this study may not validly be generalized to siblings in families from lower socio-economic groups. Participants in this study were 11 year old boys or girls from intact families whose siblings had died a sudden death about 7 years before the study. Mothers who participated were in their late 30s and fathers were in the early 50s, with a third of families being rurally based and the rest living in urban settings. The results from the study cannot validly be generalized beyond that sector of the
population of families in which SIDS has occurred which shares this demographic profile. With these caveats in mind, the substantive findings will be considered.

The specific aim of this study was to pinpoint those psychological characteristics of siblings and parents and those psychosocial characteristics of families and their wider social networks which contribute significantly to the adjustment of siblings to SIDS. Twice as many of the SIDS-siblings in this study (18%), compared with the Child Behaviour Checklist standardization sample, had significant behavioural problems. In terms of personal characteristics, these poorly adjusted SIDS-siblings had lower self-esteem and a more external locus of control compared with the rest of the group. In terms of parental characteristics, their fathers and mothers also had lower self-esteem and their mother's had poorer psychological adjustment. In terms of family functioning, fathers and mothers of poorly adjusted SIDS-siblings perceived marked problems in family organization. Both mothers and fathers in the clinical group perceived family roles to be problematic. There was a lack of clarity about roles and a lack of clear boundaries between roles. In addition mothers of poorly adjusted SIDS-siblings perceived greater problems with general family functioning and more specifically with family problem-solving routines and marital satisfaction.

Of all of these personal, parental and family factors three were of particular significance for sibling adjustment: siblings' self-esteem, maternal mental health, and siblings' locus of control. Thus, the more SIDS-siblings evaluated themselves positively; the more they believed that they had control over important sources of reinforcement; and the better their mothers' mental health, the more likely they were to be well adjusted. That is, the more likely they were to have lower levels of behaviour problems and depression.

These results suggest a number of hypotheses which explain why some siblings adjust to SIDS while others do not. The first is that siblings who adjust to SIDS may reside in families where their mothers work through their grief sufficiently to avoid mental health problems which could otherwise compromise
their capacity to offer a good-enough parenting environment for siblings to develop positive self-esteem and an internal locus of control. The second hypothesis suggested by the results of this study is that this positive outcome is less likely to happen in families where both parents have low self-esteem, where there is a lack of clarity about roles, and in which wives or mothers experience low marital satisfaction and a lack of effectiveness in family problem-solving routines. A longitudinal study would be necessary to test the validity of these hypotheses, since there are a number of alternative explanations. For example, parental self-esteem and family role clarity may not be predisposing factors as suggested, but rather be a consequence of sibling's adjustment difficulties and maternal mental health problems.

The results of the present study are consistent with those of the five published studies on siblings' adjustment to sudden infant death insofar as they show that behavioural difficulties are over-represented in SIDS-siblings (Cornwell, Nurcombe & Stevens, 1977; Defrain & Ernst, 1978; Hutton & Bradley, 1994; Mandell, McClain & Reece, 1988; Powell, 1991). This sub-group clearly require health service input to help them deal with the psychological sequelae of SIDS. Given the factors associated with poor adjustment in SIDS-siblings, probably a family therapy based service would be most appropriate.

However, it is important to highlight that the vast majority of children (82%) did not display clinically significant levels of behavioural problems on the CBCL and 92% did not show clinically significant levels of depressive symptomatology on the CDI.

With respect to the parents who participated in this study, 79% of fathers and 70% of mothers reported no clinically significant mental health difficulties on the GHQ-28. These results are comparable to the finding in a major UK community survey of over 6000 people in which 68% of respondents fell below the clinical cut-off score and in the healthy range on the GHQ-30 (Cox et al, 1987). While Cox et al's (1987) study employed the GHQ-30 rather than the GHQ-28, both instruments have been shown to yield similar results when used
for screening, therefore it is valid to compare these results with those of the present study. Our findings suggest that 7 years after the loss of a child, most parents find some way to cope with the loss sufficiently to avoid clinically significant mental health problems. This demonstrates the remarkable resilience of families in dealing with SIDS.

The relative psychological health of the majority of siblings and parents in families where SIDS has occurred suggest that services for most families with SIDS, with similar profiles to those who participated in this study, should be made available in the immediate aftermath of the bereavement and that in the longer term far less intensive service provision will be required.

**SUMMARY**

Participants in this study were 119 siblings of children who had died from sudden infant death and their parents. This non-representative self-selected group, were profiled as 11 year old boys or girls from middle or upper-middle class intact families whose siblings had died a sudden death about 7 years before the study. Mothers who participated were in their late 30s and fathers were in the early 50s, with a third of families being rural based and the rest living in urban settings. 18% obtained T-scores above the cut-off of 63 on the total problem scale or the Child Behaviour Checklist. These clinical cases had lower self-esteem and a more external locus of control compared with the rest of the group. Their fathers and mothers also had lower self-esteem and their mothers were more poorly psychologically adjusted. Compared with the non-clinical group, both mothers and fathers in the clinical group perceived marked problems in family functioning. From a wide range of measures of personal, parental and family characteristics, siblings' self-esteem, maternal mental health and siblings' locus of control were identified in a series of stepwise multiple regression analyses as the most significant predictors of siblings' adjustment.
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