Psychological Adaptation and Social Support of Parents of Pediatric Cancer Patients: A Prospective Longitudinal Study

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Objective: To investigate levels of support and the concurrent and prospective effects of support on the psychological functioning of parents of children with cancer in a prospective longitudinal study.

Methods: Parents’ (n = 128) self-perceived level of psychological distress, quantity of support, and dissatisfaction with support were assessed, at diagnosis, at 6, and at 12 months.

Results: Parents received most support at diagnosis. Self-perceived quantity decreased with time, but parents indicated they remained equally satisfied. Support significantly predicted concurrent and prospective distress of fathers, but not of mothers. Dissatisfaction with support and negative interactions were consistent risk factors for fathers. Mothers who adjusted well psychologically received more support and were less dissatisfied than mothers who remained clinically distressed. Nevertheless, no persisting effect of support was found.

Conclusions: Findings illustrate that social support varies with the stress situation and with gender. Identification of vulnerable parents at diagnosis on the basis of their perception of received quantity of and dissatisfaction with support seems difficult. Intervention efforts aimed at mobilization of needed support may be efficacious.

Key words: childhood cancer; parental adaptation; social support.
Social support has received much attention because of its beneficial effects on psychological well-being (Thoits, 1995). Evidence of both direct and buffer effects has been obtained (Sarason, Sarason, & Pierce, 1990). The few studies performed in the field of pediatric oncology support the stress-moderating role of social support on parental stress. Studies have shown that parents who adjust well to their child’s cancer received better family or overall support (Kupst & Schulman, 1988; Magni, Sylvester, Tamijioo, Zanesco, & Carli, 1988). Parents, especially fathers, of childhood cancer survivors who were experiencing low levels of support were more depressed and anxious than parents of healthy children (Speechley & Noh, 1992). Higher levels of perceived support were reportedly related to lower levels of psychological distress for parents of children in treatment (Morrow, Carpenter, & Hoagland, 1984) and to fewer posttraumatic stress disorders (PTSD) for parents of childhood cancer survivors (Speechley & Noh, 1992; Kazak et al., 1997). In contrast, one study reported no relationship between PTSD in mothers of childhood cancer survivors and perceived family and extra-familial support (Pelcovitz et al., 1996).

These studies have provided valuable information about the relationship between parental stress and social support. However, most have a cross-sectional design. Therefore, comparisons over time cannot be made, nor does such a design allow for the examination of prospective and causal effects of support on psychological well-being. Also, they lack comparability in terms of time since diagnosis. The support received at the time of the acute crisis of the diagnosis may differ from that later during treatment when parents have to cope with the chronic strains resulting from that treatment. The need for support is higher when people experience more stress (Wortman, 1984). Furthermore, most studies focus on one dimension of support. The conceptual definition of social support is not unidimensional, but distinct concepts can be distinguished (Van Sonderen, 1991). Different dimensions of support should be considered separately as each dimension may vary in its effectiveness (Van Sonderen, 1993) or relate to psychological health to a different extent (Cohen & Wills, 1985). Last, most studies focus on the beneficial effects of social support. However, childhood cancer, because of its threatening nature, may elicit negative reactions or even withdrawal from the network (Chesler & Barbarin, 1984). A study performed among cancer patients has shown that negative interactions played a greater role in predicting adjustment than positive interactions (Manne, Taylor, Dougherty, & Kemney, 1997).

A further point of interest is that women reportedly have larger and closer networks than men, and women are more able to mobilize support. Furthermore, the health benefits of support may differ between men and women (Antonucci, 1994; Shumaker & Hill, 1991).

The first purpose of this study was to examine the temporal need for social support of parents. Social support was defined in terms of frequency of supportive and negative interactions from the social network (which is a structural concept of support) and amount of dissatisfaction with support (which concerns perceived adequacy of support) (Van Sonderen, 1991). We expect that parents’ need for support or the willingness of the social network to provide support will be highest when parents confront the acute crisis of the cancer diagnosis and their distress is high (Wortman, 1984). Later in time, when the stressor is more chronic as a result of the multiple demands of cancer treatment and when levels of psychologically distress have declined, parents will receive less support. So, the frequency of interactions will decrease during the year. Although parents will receive less support with time, there will be no change over time in dissatisfaction with support. Second, in line with the results reported by Van Sonderen (1993), we predict that mothers will indicate they receive more supportive interactions than fathers. Fathers and mothers will report similar amounts of negative interactions and dissatisfaction with support. In the absence of prior research, we formulated the next two hypotheses as follows. Third, support will predict concurrent and prospective psychological functioning, and change in support will accompany change in distress. We made no specific prediction as to the influence of the direction of change, again because no prior research is known. Individual effects are expected of the different support dimensions. Dissatisfaction with support and negative interactions will predict more psychological distress (Manne et al., 1997; Morrow et al., 1984), whereas supportive interactions will predict less distress (Speechley & Noh, 1992). Fourth, the persistence of distress may depend on the status of the support at diagnosis.
Method

Participants

Parents of all children with newly diagnosed cancer in the Division of Pediatric Oncology, University Hospital Groningen, the Netherlands, during a period of 27 consecutive months were eligible. Parents whose children were diagnosed as terminally ill and those who spoke insufficient Dutch were not included. Of the 192 parents of 98 children, approached at diagnosis (Time 1, or T1), 164 parents (85%) agreed to participate. Six months later (Time 2, or T2), 10 parents were not contacted because their child had died. Of the 154 parents approached at T2, 15 refused. At twelve months (Time 3, or T3), a further 9 parents were not contacted because of the death of their child, and a further 2 parents refused. In total, 36 parents did not complete the study. The participants were 62 fathers and 66 mothers (M age = 35.9, SD = 5.5, range: 21–53 years). Educational level ranged from 1 (elementary school) to 7 (university degree), (M = 3.4, SD = 1.5). All parents were married/cohabiting, with the exception of one widow. The children were 41 boys and 25 girls (M age = 6.5, SD = 4.7, range: 0–16 years). The medical diagnoses included leukemias (n = 28), brain tumors (8), malignant lymphomas (12), Wilm's tumor (6), soft tissue (5) and bone sarcomas (1), neuroblastoma (2), germ cell tumors (2), and hepatoblastoma (2). Children were placed in one of three estimated chance for survival groups, based on type and stage of their malignancy at diagnosis by their pediatrician (Pizzo & Poplack, 1993), namely 1: initial prognosis of ≥75% (n = 26), 2: prognosis of 25%–75% (n = 34), 3: prognosis of ≤25% (n = 6). Children were placed in one of three response to treatment groups at T2 or T3 by their pediatrician, namely 1: children in remission, suffering no to minor complications, having a survival chance of >25% (T2: n = 36; T3: n = 50), 2: children in remission, who suffered a number of complications and had a survival chance at diagnosis <25% (T2: n = 17; T3: n = 12), and 3: children not in remission, who had relapsed or who had been frequently hospitalized because of serious complications (T2: n = 13; T3: n = 4).

There were no significant demographic differences between the parents who completed the study and those who did not. However, fewer of the parents of children with a survival chance of ≤25% completed the study (χ²[4] = 16.80, p < .001), mainly because the children did not survive the year.

Procedure

The pediatric oncologist introduced the study within 3 days after diagnosis. Parents were then asked to participate by the researcher. Written informed consent was obtained. Participants completed questionnaires within 14 days after diagnosis (T1), and 6 (T2) and 12 months (T3) later. Parents were instructed to complete the questionnaires independently from one another and not to consult others. Time 1 assessment took place at the hospital, because the children were hospitalized at that time. Time 2 and Time 3 questionnaires were sent to and completed at the homes, as children were then being treated in the outpatient clinic. Prepaid return envelopes were provided.

Measures

The 12-item version of the Goldberg General Health Questionnaire (GHQ; Goldberg & Williams, 1988), a self-report measure for the detection of nonpsychotic psychiatric disorders, was used in this study as an overall index of psychological distress. Parents who indicated that their symptoms were as usual or had decreased received a score of 0, whereas those who reported that their symptoms had increased somewhat or greatly received a score of 1 (range was therefore 0–12). In addition, the GHQ can be used as a case-finding instrument. A conservative cut-off score of 3 was chosen (Goldberg & Williams, 1988) to include parents with a clinically elevated level of psychological distress. The validity of the 12-item version is well documented, and internal reliability is highly satisfactory and comparable to those of longer versions (Goldberg & Williams, 1988; Koo ter & Ormel, 1991). Cronbach’s alpha in this study for the GHQ ranged from .86 to .91 for the three measurement times.

We used the Social Support List Interactions (SSL-I) and Discrepancies (SSL-D) to measure social support. This self-report questionnaire has been designed and validated in the Netherlands. Widely known instruments such as the Norbeck Social Support Questionnaire (NSSQ; Norbeck, Lindsey, & Carrier ieri, 1981), the Inventory of Socially Supportive Behaviors (ISSB; Barrera, Sandler, & Ramsey, 1981), and the Social Support Questionnaire (SSQ; Sarason,
Levine, Basham, & Sarason, 1983) were used for the development of the SSL. Psychometric research has shown that the SSL has good construct validity and high reliability (Van Sonderen, 1993). The first 34 items measure the amount of supportive interactions the respondent indicates he receives from members of the entire social network (SSL-I) and the respondents’ dissatisfaction with that support (SSL-D). Subjects are first (SSL-I) instructed to respond to questions starting with: “Does someone ever” (examples: give you a cuddle; cheer you up; compliment you; offer help in critical situations, such as illness; call you out of the blue for a chat; give you information about your behavior). Items are scored on a 4-point scale: very seldom/never, once in a while, regularly, and very often. Higher scores indicate more support. The SSL-D uses the same 34 items as the SSL-I, with instructions changed to this: Please indicate the extent to which the behavior/reaction of the people you associate with differs from what you would wish. Items can be scored in the following way: (1) just right, this is as I would like to have it; (2) I do not really miss it, but it would be pleasant if it happened somewhat more often; (3) I really miss it, I would like it to happen more often. Higher scores denote more dissatisfaction.

In addition, the SSL-I includes seven items that assess the frequency of negative interactions. The higher the score, the more negative interactions the respondent indicates he or she receives (examples: Does someone ever: treat you unfairly, reproach you for things, make unreasonable demands).

Cronbach’s alphas for internal reliability in this study were high, namely .92, .92, and .94 for the SSL-I; .94, .95, and .95 for the SSL-D; and .78, .77, and .84 for the negative interactions subscale of the SSL-I for T1, T2, and T3, respectively.

**Results**

**Preliminary Analyses**

The mean scores on the GHQ, SSL-I, and SSL-D of the parents who completed the trial were not significantly different (unpaired t tests) from those of the parents who dropped out, at diagnosis.

Correlational analyses (tested at a $p < .01$ level, to control for Type I error) showed no significant associations between the study variables (parental psychological distress, supportive interactions, negative support, and dissatisfaction with support) and the demographic variables (age of parent and child, gender of child, parental educational level) for fathers or mothers. There were also no significant relationships with the illness variables: estimated chance for survival and response to treatment. We therefore decided not to control for these variables in the analyses.

Repeated measure analysis of variance (ANOVA) showed that levels of reported psychological distress were highest at diagnosis and decreased significantly with time for both fathers, $F(1, 78) = 23.17, p < .001$, and mothers, $F(1, 93) = 28.13, p < .001$ (Table I).

**Hypothesis 1: Most Support Received at Diagnosis, Decline of Support Over the Year, No Change in Dissatisfaction With Support**

Analyses were conducted separately for fathers and mothers. Repeated measure analysis of variance (MANOVA) was used to examine whether parents changed over time in quantity of support or in dissatisfaction with support. Both fathers, $F(1, 93) = 16.31, p < .001$, and mothers, $F(1, 99) = 23.03, p < .001$, indicated they received significantly less supportive interactions with time (Table I). Inspection of the mean scores at the measurement times showed that the amount of received support diminished mainly during the first 6 months following the diagnosis. No time effects were found for dissatisfaction with support (fathers: $F[6, 69] = 0.05$, ns; mothers: $F[6, 85] = 0.56$, ns). So parents, as a group, remained equally satisfied with the support they received, although the amount of support decreased over the year (hypothesis 1 accepted). Mothers received significantly less negative interactions over the year, $F(1, 90) = 6.26, p < .01$, but fathers did not, $F(1, 96) = 0.71$, ns. The mean values of negative interactions were notably low.

**Hypothesis 2: Comparison Fathers With Mothers, Mothers Will Receive More Support Than Fathers, No Differences in Dissatisfaction With Support and in Amount of Negative Support**

Paired (because of the dependency between couples) $t$ tests were used to investigate differences between fathers and mothers. Contrary to our expectation, we found that mothers indicated they received significantly more support than fathers only...
at 6 months after diagnosis (t = 2.31, p < .03), instead of at all times. Although equal amounts were predicted, mothers reported less negative support than fathers at 6 (t = 2.12, p < .05) and 12 months (t = 2.16, p < .05) after diagnosis. Last, fathers and mothers were equally dissatisfied with support at all measurement times, a finding in support of hypothesis 2 (Table I).

**Hypothesis 3: Predictive Effects of Support on Psychological Distress**

Multiple regression analyses were conducted to investigate the predictive effects of the support variables on psychological functioning, concurrently (within time) and prospectively (Time 2 or Time 3 distress and Time 1 support, controlled for Time 1 distress). By statistically controlling for levels of the dependent variable at Time 1, we can make inferences about the direction of the causal influence (Cohen & Brook, 1987). Regression analyses were also computed to examine how well change over time in the support variables predicted change in psychological distress. In these analyses the effect of distress at diagnosis on subsequent psychological distress was partialled by entering initial distress in the first step. To control for earlier levels of support, the support variables at Time 1 were entered in the second step, and in the third step the support variables at Time 2 or Time 3 were entered. This way short-term effects on parental distress can be identified (Cohen & Brook, 1987). The prospective regression analyses and those for change over time were performed hierarchically to investigate the increment in variance accounted for by the support variables.

**Concurrent Analyses (Table II).** Multiple regression analyses showed that fathers’ ($R^2 = .12, ns$) nor mothers’ ($R^2 = .01, ns$) psychological distress at diagnosis was significantly predicted by the three support variables together. Only supportive interactions had a direct positive effect on fathers’ distress at that time. Mother’s psychological distress at T2 ($R^2 = .10, ns$) and T3 ($R^2 = .11, ns$) was also not significantly predicted by the support variables together. Unique positive effects were found for supportive interactions at T2 and for dissatisfaction with support at T3. The support variables together significantly predicted fathers’ distress at T2 ($R^2 = .19, p < .01$) and T3 ($R^2 = .35, p < .001$). Dissatisfaction with support had a significant main positive effect on the fathers’ distress both at T2 and T3.

**Prospective Analyses.** The support variables as measured at diagnosis were entered in the second step after controlling for distress at T1, which was entered in the first step (Table III). The support variables accounted for a significant increment in the explained variance of fathers’ future distress at T2, $F_{change} = 3.08, p < .05$, and at T3, $F_{change} = 5.06, p < .01$. Dissatisfaction with support and negative interactions as reported by the fathers at diagnosis had significant individual positive effects. The analyses for the mothers showed that these early variables together did not account for a significant increment in the explained variance of her future distress either at T2, $F_{change} = 0.12, ns$, or at T3, $F_{change} = 1.92,
None of the early support variables had an individual effect on mothers’ distress at T2. Supportive interactions (negatively) and dissatisfaction with support (positively) had a unique effect on mothers’ level of distress at T3.

**Analyses of Change.** For these analyses T2 or T3 support variables were entered in the third step (Table III). Changes in the support variables occurring during the first 6 months after diagnosis did not account for a significant portion of the variance in either fathers’, $F_{\text{change}} = 2.07, \text{ns}$, or mothers’, $F_{\text{change}} = 2.19, \text{ns}$, distress at T2. Increased experience of negative support individually predicted higher levels of psychological stress in the fathers at that

**Table II.** Multiple Regression Analyses of Psychological Distress and Support Variables, Concurrently

<table>
<thead>
<tr>
<th>Predictors</th>
<th>T1 Predictors</th>
<th>T2 Predictors</th>
<th>T3 Predictors</th>
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<tbody>
<tr>
<td></td>
<td>$\beta$</td>
<td>$R^2$</td>
<td>$F$</td>
</tr>
<tr>
<td>Fathers ($n = 62$)*</td>
<td>.12</td>
<td>2.58</td>
<td>.19</td>
</tr>
<tr>
<td>Interactions</td>
<td>.28*</td>
<td>.16</td>
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<tr>
<td>Dissatis.</td>
<td>.19</td>
<td>.19</td>
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<tr>
<td>Neg. support</td>
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<td>.01</td>
<td>0.19</td>
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<tr>
<td>Mothers ($n = 66$)**</td>
<td>.01</td>
<td>.29*</td>
<td>.10</td>
</tr>
<tr>
<td>Interactions</td>
<td>.06</td>
<td>.25</td>
<td></td>
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<tr>
<td>Dissatis.</td>
<td>.05</td>
<td>.31*</td>
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<tr>
<td>Neg. support</td>
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<td>.02</td>
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</tbody>
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* $T1 p = \text{ns}; T2 p < .01; T3 p < .001$.
** $T1 p = \text{ns}; T2 p = \text{ns}; T3 p = \text{ns}$.
*** $p < .05$.
** $p < .01$.
**** $p < .001$.

**Table III.** Hierarchical Multiple Regression Analyses of Psychological Distress and Support Variables, Prospectively and Change Over Time

<table>
<thead>
<tr>
<th>Predictors</th>
<th>T2 Predictors</th>
<th>T3 Predictors</th>
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<td></td>
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<td>.13</td>
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<tr>
<td>T1 distress</td>
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<td>.12</td>
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<tr>
<td>T1 interactions</td>
<td>-.11</td>
<td></td>
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<tr>
<td>T1 dissatisfaction</td>
<td>.31**</td>
<td></td>
</tr>
<tr>
<td>T1 neg. support</td>
<td>.29*</td>
<td></td>
</tr>
<tr>
<td>Step 2: prospective analysis</td>
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<td></td>
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<td>T2 or T3 interactions</td>
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<td>.08</td>
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<tr>
<td>T2 or T3 dissatis.</td>
<td>.13</td>
<td></td>
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<tr>
<td>T2 or T3 neg. support</td>
<td>.30*</td>
<td></td>
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<td>Mothers</td>
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<tr>
<td>Step 1: to control for</td>
<td>.33</td>
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<tr>
<td>T1 distress</td>
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<tr>
<td>T1 interactions</td>
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<tr>
<td>T1 dissatisfaction</td>
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<tr>
<td>T1 neg. support</td>
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<td>Step 3: analysis of change</td>
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<td>T2 or T3 dissatis.</td>
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<td>T2 or T3 neg. support</td>
<td>.22</td>
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<td>ns</td>
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*p < .05.
**p < .01.
****p < .001.
time. Changes in the support variables together during the 12 months following diagnosis accounted for a significant increment in the explained variance of fathers’ T3 distress, $F_{\text{change}} = 5.37, p < .01$, but not in that of the mothers, $F_{\text{change}} = 1.07, \text{ns}$. Increased dissatisfaction with support and more experienced negative support each significantly accompanied higher levels of distress in the fathers. None of the changes in the support variables significantly and individually accompanied changes in mothers’ levels of distress.

This result suggests that change in dissatisfaction with support or in negative interactions caused change in distress. However, change in distress may have caused change in support. We therefore examined the effect of distress at diagnosis on these two support variables on T2 and T3 for the fathers, partialling the T1 support variable. The analyses showed that there was no effect of Time 1 distress on the support variables at T2 or T3, when fathers’ earlier support levels were controlled. This means that dissatisfaction with support and negative support predicted fathers’ psychological distress and not vice versa.

**Hypothesis 4: Persistence of Distress**

To examine whether the persistence of distress was conditional on the support variables at diagnosis, we included the multiplicative distress $\times$ support interaction term into the regression analysis while controlling for the main effects of initial distress and initial support variable. Three separate multiple regression analyses were conducted, entering the two-way interaction term of initial distress $\times$ initial 1: supportive interactions, 2: dissatisfaction with support, or 3: negative interactions. T2 or T3 psychological distress was the dependent variable. The interaction variables did not contribute significantly. So, the persistence of distress was not conditional on the initial level of one of the support variables.

The absence of a significant effect of the support variables together on mothers’ distress is striking. This finding motivated us to conduct the following analyses.

**Individual Differences in the Need for Support**

Former analyses have shown that parents as a group received less support with time but remained equally dissatisfied. However, the need for support may vary for individual parents. Although little support may satisfy the need of some parents, others may be dissatisfied even though they receive more support. To gain more insight into the extent to which amount of support was perceived as satisfactory, we divided the parents into three groups based on their psychological functioning during the study period. This allowed us to examine if the need for support was better fulfilled for one of these parent groups. The first group consisted of parents who remained clinically distressed as measured with the GHQ at all measurements, the continuing cases (fathers $n = 22$, mothers $n = 25$). The second group included parents with a clinically elevated level at diagnosis but who were doing well at 12 months, the remission cases (fathers $n = 28$, mothers $n = 31$). The third group included parents who scored below GHQ case-level at all measurements, the continuing noncases (fathers $n = 7$, mothers $n = 8$).

Repeated measures analyses of variance (MANOVAs) were computed with time as within-subjects factor and the above described variable to test for between-subjects effects with supportive interactions and dissatisfaction with support as dependent variables. Figures 1 and 2 show the results. The x-axis represents the amount of support received, with higher scores indicating that more supportive interactions were reported. The y-axis represents dissatisfaction with support. The higher the score, the more dissatisfied parents were with the amount of support they received.

Repeated measures analysis of supportive interactions for fathers revealed a significant time effect, $F = 8.35, p < .001$, but no significant group or interaction effect. This means that all fathers received less support with time. No significant time effect, a significant group effect, $F = 6.23, p = .004$, and no significant interaction effect were found for dissatisfaction with support. Consequent one-way ANOVA (Scheffé test) indicated a significant group effect at T1, $F(2) = 3.53, p = .04$, at T2, $F(2) = 4.13, p = .02$, and at T3, $F(2) = 6.08, p = .004$. However, none of the groups could be identified as significantly different from the others. These results indicate that the more fathers were dissatisfied with the support they received, irrespective of how much they received, the more psychological distress they reported.

The analyses for the mothers showed a significant time effect, $F = 20.87, p < .001$, for supportive interactions but not for dissatisfaction with support, $F = 0.36, \text{ns}$. There was a significant group ef-
fect for both supportive interactions, $F = 4.51$, $p = .015$, and for dissatisfaction with support, $F = 4.75$, $p = .012$. One-way ANOVA (Scheffé test) indicated a significant group effect for supportive interactions at T1, $F(2) = 4.53$, $p = .01$, and at T3, $F(2) = 4.54$, $p = .01$, but not at T2. Remission case mothers received more support at T1 and T3 than the other two groups of mothers. There was also a significant group effect for dissatisfaction with support at T1, $F(2) = 3.62$, $p = .03$, and at T3, $F(2) = 4.91$, $p = .01$, but not at T2. The continuing-case mothers were most dissatisfied with support. No significant interaction effects were found. These results indicate that mothers who were clinically distressed at diagnosis but who adjusted well with time, received more support and were less dissatisfied than mothers who continued to be clinically distressed.

**Discussion**

Consistent with earlier studies, our results showed that parents reported high levels of psychological distress at the time of diagnosis, followed by a decline over time (Dahlquist et al., 1996). However, parental levels of distress were still higher at one year than those of a normative group (Hoekstra-Weebers, Jaspers, Kamps, & Klip, 1998).

This study examined the support of parents of newly diagnosed pediatric cancer patients over a time-period of 1 year. Support has been addressed in three different ways: (1) frequency of supportive interactions, (2) frequency of negative interactions, and (3) dissatisfaction with support. The results revealed that parents indicated they received the most support around the time of the acute crisis at diagnosis. Parents’ efforts to mobilize the support they needed or the willingness of the social network to provide support was highest at that time. This support may be considered crisis support. Parents indicated they received less support at later points during the year when they were coping with the more chronic stress during treatment. This decline was most prominent after the first 6 months. Although the self-perceived quantity of support decreased, levels of dissatisfaction with support remained unchanged, which confirmed our hypothesis. These findings show that there is variation in support mobilization or provision, depending on the stress situation. This is consistent with earlier research, which has reported that an acute stressor may result in support mobilization in the short run and that a chronic stressor may erode received support over time (Thoits, 1995).

Our results partially supported the expected gender differences and similarities. In accordance with Van Sonderen (1993), we found that fathers and mothers were equally dissatisfied with the support they received. Mothers only indicated they received more support at 6 months than fathers, but not at diagnosis and at 12 months, which was in contrast to earlier studies (Antonucci, 1994). An explanation may be that in the case of childhood cancer, much of the support (for instance taking care of siblings, doing household chores, emotional support) is offered to or mobilized by couples leading
to more gender similarity in quantity of support than was expected.

Parents reported few negative interactions. Whereas mothers reported they had less of these interactions with time (as predicted), fathers did not. This decline resulted in an unexpected gender difference; fathers reported they had more negative interactions than mothers. Negative interactions also significantly predicted fathers' level of psychological distress, in contrast to that of the mothers. An explanation for the more prominent role of negative support for fathers may be that more fathers encountered difficulties in their work than mothers. Most of the fathers were employed, whereas this was not the case for the mothers (88% of the fathers held a full-time job and 1% of the mothers, a further 6% of the fathers and 32% of the mothers were employed part-time). Both parents frequently stayed in the hospital during initial treatment, and both often accompanied their child to the outpatient clinic later. Fathers were, therefore, regularly absent from work, which may have led to irritation and criticism. It may also be that absence from work in this specific situation is more expected and accepted from mothers than from fathers.

In accordance with our third hypothesis, we found that the social support variables together accounted for significant proportions in the prediction of a father's psychological distress, concurrently, prospectively and when considering change. However, this was not found for the mothers. Social support, as measured in this study, seems to play a greater role in the psychological functioning and adjustment of fathers than of mothers. Others have also observed gender differences in the connection between mental health and social support (Shumaker & Hill, 1991). Differences in causal effects of support on mental health have also been reported (Johnson, 1991). These authors suggest a difference in measurement instruments or different mechanisms that link social relations to health for men and women as explanation for these results. For example, a combined impact of different dimensions of support was greater for women that for men (Antonacci & Akiyama, 1987). This was also found in our study, as we will explain. However, other factors may also be more relevant in predicting mothers' psychological functioning. Variables that could be of importance are personality, family functioning, parent-child interaction, parenting competence, and partner functioning, (Hoekstra-Weebers et al., 1998; Kazak et al., 1998; Wallander & Varni, 1998).

In agreement with our hypothesis, we found that dissatisfaction with support (both parents) and negative interactions (fathers) were associated with higher levels of psychological distress. In contrast to our hypothesis, we found positive relationships between supportive interactions and concurrent distress for fathers at diagnosis and for mothers at 6 months. An explanation may be that these parents received more help than they wanted, leading to irritation and more distress. Many parents complained about phones continuously ringing and people coming to visit unannounced at all times, leaving little time for family privacy. A second explanation may well be that more distressed parents receive more support because they arouse more sympathy.

The relationship between supportive interactions and dissatisfaction with support, on one hand, and psychological functioning, on the other, appears to be more complex for mothers than for fathers. Mothers were more at risk for psychological distress when they received less support and were more dissatisfied at diagnosis. Their need for support appears to be less well fulfilled than that of mothers who adjusted well psychologically over the year. Fathers were more at risk when they were dissatisfied with support, irrespective of the self-perceived quantity of support. This result is in contrast to a cross-sectional study of parents of children who were out of treatment, that reported on parents, and especially fathers, with low levels of support who were at risk for psychological distress (Speechley & Noh, 1992). Our study shows that, for fathers, not so much the quantity of support but the dissatisfaction with that support appeared relevant both for direct and for future psychological functioning, a finding consistent with Morrow et al. (1984). Men are reported to benefit more from support from the closest person, their spouse, than women (Stansfeld, Führer, & Shipley, 1998). It may well be that the greater involvement of the mothers in the daily care for the ill child limits their ability to provide this support. This issue may be of interest for future studies.

We did not find evidence for the assumption that the persistence of distress was conditional on one of the social support variables as reported by the parents at diagnosis. This suggests that a strategy of identifying vulnerable parents on the basis of a high or low score on social support measures as used in this study does not seem efficient.

This study has some limitations. First, because
all measures were self-report, there could be a degree of shared method variance. Parents may be biased as to the quantity of and dissatisfaction with their support, depending on their psychological status. However, the prospective design of the study allowed for an investigation of causal direction. The results show that support predicted distress and not vice versa. Second, childhood cancer is a rare disease (Miller, Young, & Novakovic, 1995), resulting in small study samples. Even so, the number of parents who participated in this study is large when compared to the other longitudinal study known (Kupst et al., 1988). Furthermore, fathers were retained in the study, and the investigation of their functioning has been neglected (Dolgin & Phipps, 1996). This has allowed us to analyze the relationship between the support and distress of fathers as a separate entity, as suggested by others (Speechley & Noh, 1992). Several interesting gender differences have emerged from the analyses. Third, only parents whose children were surviving were asked to participate in follow-up. The results are therefore restricted to parents of surviving children. Fourth, social support is a complex phenomenon. We have chosen in this study to address the global quantity of support (both positive and negative) and the dissatisfaction with support, but we have not distinguished different types of support. It has been suggested that there is variation in the effectiveness of different types of support, depending on the situation or the situation-specific needs (Helgeson, 1993). For example, instrumental support would be more effective for recently diagnosed cancer patients, whereas emotional support would be more appropriate later in time (Dunkel-Schetter, 1984). Future studies might address this point.

In summary, this study shows variation in support demands/provision, depending on the specific stress situation. The effects of support on psychological functioning also vary with parental gender. Our results support the social causation model. Social support is considered a modifiable risk or protective factor (Wallander & Varni, 1998). These results may help professionals design intervention programs for parents, keeping in mind the differential effect of various aspects of social support on the psychological functioning and adaptation of fathers and mothers of chronically ill children.

Acknowledgments

This study has been funded by the Dutch Cancer Society and by the Pediatric Oncology Foundation Groningen.

Received September 14, 1999; revisions received January 18, 2000, and July 6, 2000; accepted December 8, 2000

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