Do the Parent–Child Relationship and Parenting Behaviors Differ Between Families With a Child With and Without Chronic Illness? A Meta-Analysis

Martin Pinquart, PhD
Department of Psychology, Philipps University

All correspondence concerning this article should be addressed to Martin Pinquart, PhD, Department of Psychology, Philipps University, D-35032 Marburg, Gutenbergstrasse 18, Germany.
E-mail: pinquart@staff.uni-marburg.de

Received August 3, 2012; revisions received March 11, 2013; accepted March 15, 2013

Objective The present meta-analysis compared the quality of the parent–child relationship as well as parenting behaviors and styles of families with a child with chronic physical illness with families of healthy children or test norms. **Methods** Empirical studies were identified with the help of electronic databases and cross-referencing. Based on 325 included studies, random-effects meta-analysis was performed. **Results** Although most effect sizes were small or very small, the parent–child relationship tended to be less positive if a child had a chronic physical illness ($g = -.16$ standard deviation units). In addition, lower levels of parental responsiveness (emotional warmth; $g = -.22$) as well as higher levels of demandingness (control, monitoring; $g = .18$) and overprotection ($g = .39$) were observed in these families. However, effect sizes were heterogeneous and only significant for a limited number of diseases. There was also some evidence for higher levels of authoritarian ($g = .24$) and neglectful parenting ($g = .51$) as well as lower levels of authoritative parenting compared with families with healthy children ($g = -.13$). Effect sizes varied, in part, by length of illness, child age, rater, assessment method, and target of comparison. **Conclusions** We conclude that most families with a child with chronic physical illness adapt well with regard to the parent–child relationship and parenting behaviors/styles. Nonetheless, some families of children with specific diseases—such as epilepsy, hearing impairment, and asthma—may have difficulties finding appropriate levels of protective behaviors, control, and parental warmth and building positive mutual relationships between parents and children.

Key words chronic illness; meta-analysis; parent–child relationship; parenting.

Chronic illness can be defined as a condition that lasts for a considerable period of time or has a sequela that persists for a substantial period or necessitates a period of continuous hospitalizations for more than a month (Thompson & Gustafson, 1996). In the present study, we ask whether parenting behaviors and the quality of the parent–child relationship differ between families with a child with chronic physical illness and families with healthy children or test norms. Answering this question provides information regarding whether similar or different interventions should be offered for families with and without a child with chronic illness.

Of the different relationships of children, the relationship with their parents is usually the most important. Across theories of *parent–child relationship*s, the emotional bond formed between the parent and child (connectedness, closeness, mutuality of expression of positive emotions, or attachment security) is considered as the most important dimension (Clark & Ladd, 2000; Lamb & Lewis, 2011). Secure attachment indicates that the infant

Journal of Pediatric Psychology 38(7) pp. 708–721, 2013
doi:10.1093/jpepsy/jst020
Advance Access publication May 9, 2013

uses the caregiver as a secure base for exploration and seeks proximity when being distressed, such as in strange situations. Indicators of secure attachment of older children and adolescents are feeling accepted, feeling close, and trusting their parents (Lamb & Lewis, 2011).

Positive parent–child relations can be promoted by positive *parenting*. Research on parenting has identified three core dimensions, namely (a) the degree of parental responsiveness (e.g., warmth and support), (b) the degree of demandingness of the parent (supervision, rules/structure, and disciplinary efforts) (Baumrind, 1967; Maccoby & Martin, 1983), and (c) the promotion of autonomy (vs. overprotection) of older children and adolescents (e.g., Steinberg, 2010). The combination of responsiveness and demandingness led to the most often used typology of *parenting styles* (Maccoby & Martin, 1983): An authoritative parent balances high levels of demandingness with high levels of responsiveness. An authoritarian parent expresses high levels of demandingness and low levels of responsiveness. A permissive parent exhibits low levels of demandingness and high levels of responsiveness. Finally, a neglectful parent exhibits low levels of both demandingness and responsiveness.

Parenting dimensions and styles and the quality of the parent–child relationship play crucial roles in psychological development in general (e.g., Herman, Dornbusch, Herron, & Herting, 1997; Lamb & Lewis, 2011; Steinberg, 2010) and in the adaptation of children with chronic illness in particular, such as adherence to the medical regimen (e.g., Davis et al., 2001; Ellis et al., 2007). Many studies found that the combination of high demandingness and responsiveness (authoritative parenting) contributes to children's positive health behaviors (Tinsley, Markey, Ericksen, Kwasman, & Ortiz, 2002). These positive effects are probably based on the promotion of a warm parent–child relationship, which leaves children more open for parental influences, and the promotion of self-reliance due to an appropriate balance of restrictiveness and autonomy support (Steinberg, 2010). In contrast, low levels of autonomy support (parental overprotection) relate to poor child adjustment and health outcomes (e.g., Mullins et al., 2004).

Professionals have suggested that raising a child with chronic illness may alter the ability to parent effectively and the quality of the parent–child relationship. We will start with factors that are relevant for families with a child with a chronic illness in general, followed by more specific factors. First, parents of children with a chronic illness face more child-rearing responsibilities than parents of healthy children (e.g., meeting the child's needs for physical treatment; e.g., Drotar, 1992): Distributing parental energy across a greater number of responsibilities may leave less time or energy for individual parenting tasks (the competing-demands hypothesis; Drotar, 1992). Some parents of a child with a chronic medical condition may feel overwhelmed and incompetent in dealing with the demands of the child's illness, and withdraw from their child (Power & Franck, 2008). Second, other sources of elevated parental stress refer to financial restrictions when having to pay for medical procedures (Teubert & Pinquart, 2013), and elevated levels of behavior problems associated with many chronic illnesses (Pinquart & Shen, 2011). Some parents also feel disappointment and anger with the child for not fulfilling the parents' expectations (Rosenberg, Kapp-Simon, Starr, Cradock, & Speltz, 2011). Higher distress could impair parental ability to provide good care to their child. Third, as a response to stressors, parents of children with a chronic physical illness have been found to show elevated levels of depressive symptoms (Teubert & Pinquart, 2013). Parental depression has been linked to decreased warmth and nurturance and a lower quality of the parent–child relationship (e.g., Lim, Wood, & Miller, 2008). Fourth, illness-specific factors may also play a role. For example, long hospitalization of the child may impair the development of the mother–child relationship owing to spending less time together (e.g., in the case of long-term cancer treatment). In addition, some kinds of chronic illness impair language skills (e.g., hearing impairment, unrepaired cleft lip and palate), which may have a negative effect on the quality of parent–child communication (e.g., Meadow-Orlans, Spencer, & Koester, 2004).

Empirical results are contradictory as to whether families with and without children with a chronic physical illness differ with regard to parenting and quality of the parent–child relationship. For example, some narrative reviews of the literature reported that mothers of children with disabilities provided fewer positive responses and more negative responses, and showed lower levels of positive affect and sensitivity to infant cues as well as higher levels of control (Coffey, 2006; Rogers, 1988). However, other authors have suggested that parents of a child with chronic illness may be *more* caring and providing and may demonstrate greater acceptance than parents of healthy children to compensate the child for his or her suffering (e.g., Tartakovsky & Hamama, 2011). These parents may even show supportive and protective behavior, which is excessive in light of the child's developmental stage (overprotection; Thomasgard, Metz, Edelbrock, & Shonkoff, 1995). Nonetheless, results are inconsistent as to whether parents of children with a chronic illness do (e.g., Devine, Holbein, Psihogios, Amaro, & Holmbeck, 2012) or do not (e.g., Luyckx, Goossens, Missotten, &

Moons, 2011) show higher levels of overprotection than other parents.

Given the heterogeneity of results of individual studies, meta-analysis is an adequate tool for integrating the available findings. The present study is the first meta-analysis that compares parenting dimensions/styles and the quality of the parent–child relationship in families with and without a child with chronic physical illness.

Research Questions

The first aim of the meta-analysis was to analyze whether families with a child with chronic physical illness differ from other families with regard to levels of parental responsiveness, demandingness, and overprotection (vs. autonomy support) as well as positivity of the parent–child relationship. In addition, we asked whether the two groups of parents differ with regard to the prevalence of authoritative, authoritarian, permissive, and neglectful parenting. For the second study aim, we analyzed whether the size of differences varies by illness characteristics, sociodemographic variables, and study characteristics.

Illness Characteristics

Kind of Illness

We expected to find the strongest between-group differences in studies on epilepsy and hearing impairment. Epilepsy is associated with high levels of behavior problems of the child (Pinquart & Shen, 2011) as well as high levels of parenting stress that may negatively affect parenting behaviors and the quality of the parent–child relationship (Teubert & Pinquart, 2013). Hearing impairment leads to impaired communication between children and hearing parents (Meadow-Orlans et al., 2004) and elevated levels of behavior problems (Pinquart & Shen, 2011).

Illness Duration

Effect sizes were expected to decline with longer duration of the illness because a longer duration gives more time to adapt parental behavior toward the child's illness. In fact, Carpentier, Mullins, Wolfe-Christensen, and Chaney (2008) observed that a longer duration of the illness was associated with lower parental overprotection.

Sociodemographic Variables

Child Age

We expected that effect sizes would be smaller in older samples. Older children and adolescents tend to take more responsibility for the management of their disease, thus reducing the need for parental control and protection. In fact, Carpentier et al. (2008) showed lower levels of parental (over)protection in families with older children.

Child Gender

We also tested whether effect sizes would vary by child gender. Cappelli, McGrath, MacDonald, Katsanis, and Lascelles (1989) observed elevated levels of overprotection in mothers of girls with cystic fibrosis, whereas no such difference was found for mothers of boys. We were interested whether this result could be generalized to parents of children with other chronic illnesses, other dimensions of parenting, and the parent–child relationship in general.

Parental Gender

We also wanted to test whether effect sizes would be stronger with regard to maternal than paternal parenting and regarding the mother–child relationship as compared with the father–child relationship. Mothers may be more strongly affected by the child's illness because they often quit their job to care full time for their chronically ill child while fathers continue to work outside of the home (Sloper, 2000).

Ethnicity

The present study tested whether effect sizes would be lower in studies with a higher percentage of members from ethnic minorities. Collectivistic values are widespread in ethnic minorities of Western countries, and these values may help the family to cope with a chronic illness (e.g., Koinis-Mitchell et al., 2012).

Country

We were interested in whether smaller effect sizes would be found in families from developing and threshold countries because collectivistic values are more prevalent in developing and threshold countries than in developed Western countries (Triandis, 2001).

Study Characteristics

Rater

Based on work by Noll, McKellop, Vannatta, and Kalinyak (1997), the present study tested whether larger effect sizes would be found in observational studies than in studies using parental self-reports. Parents of a child with chronic illness may not want to be different from other parents, and avoid answers that may show such differences.

Target of Comparison

We analyzed whether effect sizes would be smaller in studies that compared with general test norms rather than a healthy control group because the norm population probably includes some children with chronic illnesses.

Publication Status

As nonsignificant results may be less likely to be published (Lipsey & Wilson, 2001), we tested whether the effect sizes would be smaller in unpublished than in published studies.

Year of Publication

We tested whether between-group differences would be smaller in more recent studies. Progress has been made in the treatment of some chronic diseases and the development of services for young people with chronic illness (e.g., Bleyer, 2002). This may reduce the effects of a chronic illness on parenting behaviors and on the parent–child relationship.

Study Quality

The meta-analyses explored whether the size of between-group differences varies by two characteristics of study quality, namely, whether community-based probability samples or clinical convenience samples were used and whether the patient groups and control group were matched according to sociodemographic variables. No directed hypothesis was stated for these moderator variables.

Methods

Sample

Published and unpublished studies were identified from the literature through electronic databases (Adolesc, PSYCINFO, MEDLINE, Google Scholar, PSYNDEX [an electronic database of psychological literature from German-speaking countries]—search terms: [chronic illness OR chronic disease OR disability OR AIDS OR allergy OR asthma OR arthritis OR cancer OR cerebral palsy OR cleft OR cystic fibrosis OR deaf OR diabetes OR epilepsy OR fatigue syndrome OR headache OR hearing impairment OR heart OR HIV OR inflammatory bowel OR kidney OR liver OR migraine OR rheumatism OR renal OR scoliosis OR sickle cell OR spina bifida OR visual impairment] AND [parenting OR child rearing OR demandingness OR responsiveness OR overprotection OR attachment OR parent-child relation OR mother-child relation OR father-child relation]) and cross-referencing.[1] Criteria for inclusion of studies in the present meta-analysis were as follows:

(a) The studies had been published or presented before February, 2013.
(b) They compared the parenting dimensions or styles or the quality of the parent–child relationship between children and adolescents with chronic physical illness and their healthy peers or test norms, or they provided sufficient information for a comparison with established normative data.
(c) Mean age of participants was $\leq$18 years.
(d) Standardized between-group differences in the outcome variables were reported or could be computed.

Documentation of physician diagnosis within each study was not a requirement because of the need to include broad-based survey studies for which medical documentation might not be available. To include studies from different regions around the world, we also did not limit the included studies to those written in English.

We identified 1,679 entries. After checking the abstracts, 1,201 papers were excluded because they did not provide quantitative empirical data and/or did not focus on children and adolescents with a chronic physical illness. Eight of these papers also had to be excluded because they were unavailable via interlibrary loan. After checking the full text of the remaining 478 papers, 153 papers had to be excluded because they did not allow for a comparison with healthy children (e.g., owing to the use of illness-specific measures or the modification of generic measures), did not fulfill the other inclusion criteria (e.g., only assessment of parenting dimensions that were not a focus of the present meta-analysis, such as consistency; mix of children with chronic physical illness and developmental disabilities; mean age $\geq$19 years), or duplicated results of included studies. Thus, 325 papers were included in the final meta-analysis. A list of the included studies is provided in the Appendix (see supplementary material online).

We entered the number of patients and control group members, mean age, percentage of girls and of members of ethnic minorities, percentage of mothers, the country of data collection, year of publication, type of illness, duration of illness, the sampling procedure (1 = probability samples, 0 = convenience samples), the use of a control group (0 = yes, 1 = comparison with test norms), equivalence of patients and control group (1 = yes, 2 = not tested, 3 = no), the rater of outcome variables (1 = child,

[1]In the first electronic search, we combined (chronic illness OR chronic disease OR disability) AND (parenting OR child rearing OR demandingness OR responsiveness OR overprotection OR attachment OR parent-child relation OR mother-child relation* OR father-child relation*). Because cross-referencing identified additional relevant studies that did not include these terms, we extended the search terms by including the names of the diseases in the final search. Based on reviewers' recommendations, our meta-analysis does not include obesity, as this condition can be cured and most available studies did not provide information whether obesity persisted over the time necessary for defining an illness as chronic (Thompson and Gustafson, 1996).

2 = parent, 3 = observer/clinician), the measurement of the variables, and the standardized size of between-group differences in the assessed outcome variables. If between-group differences were provided for several subgroups within the same publication (e.g., for different illnesses), we entered them separately in our analysis instead of entering the global association. If data from more than one rater were collected, we entered the effect sizes separately because we were interested in whether the effect size would vary by the source of information. However, to avoid a disproportional weighting of these studies, we adjusted the weights of the individual effect sizes so that the sum of the weights of the effect sizes was equal to the weight of the study if only one effect size had been reported (Lipsey & Wilson, 2001). The author and a graduate student with experience in child psychology and research methods coded one third of the studies separately. A mean inter-rater reliability of 92% (range: 88–100%) was established. Discrepancies were resolved by consensus.

Measures

The quality of the parent–child relationship was assessed with a subscale of the Kidscreen-52 (Ravens-Sieberer, 2006; 23 studies), a subscale of the Offer Self-Image Questionnaire (Offer, Ostrov, Howard, & Dolan, 1992; 20 studies), the Strange Situation (Ainsworth, Blehar, Waters, & Wall, 1978; 16 studies), a subscale of the Pictorial Scale of Perceived Competence and Social Acceptance for Young Children (Harter & Pike, 1984; 12 studies), a subscale of the ''I think I am'' (Ouvinen-Birgerstam, 1985; 9 studies), the Behavioral Assessment System for Children (Reynolds & Kemphaus, 1992; 6 studies), and related instruments (44 studies).[2]

Dimensions or styles of parenting were often assessed with behavioral observations (44 studies), the Parent Protection Scale (Thomasgard et al., 1995; 14 studies), the Parental Bonding Instrument (Parker, 1990; 13 studies), the Child Report of Parent Behavior Inventory and its modifications (Schaefer, 1965; 6 studies), the Child Rearing Practices Report (Block, 1981; 6 studies), the Parenting Scale (Arnold, O'Leary, Wolff, & Acker, 1993; 5 studies), and related instruments (90 studies).

[2]Not all studies provided results for all assessed variables. Whereas some studies assessed only the quality of the parent–child relationship, others measured only selected aspects of parenting. The reported numbers of studies using a particular measure are lower than the total number of effect sizes per measure (Table II) because some studies provided more than one effect size per measure (e.g., when including data from different diseases).

Statistical Integration of the Findings

Calculations for the meta-analysis were performed in six steps, using random-effects models and the method of moments (for computations, see Lipsey & Wilson, 2001).

1. We computed effect sizes *d* for each study as the difference in parenting or parent–child relationship between the sample with chronic illness and the control sample, divided by the pooled standard deviation (*SD*). In ~32% of the included studies, the authors provided only test scores for children with chronic illness. Here we used the norms from the test manual for comparison, if available. In ~5% of the cases, we had to search for a study with a sample that was similar to the patient sample with regard to age and gender distribution but focused on families with healthy children. Outliers that were more than 2 *SD* from the mean of the effect sizes were recoded to the value at 2 *SD* (Lipsey & Wilson, 2001).
2. Effect size estimates were adjusted for bias due to overestimation of the population effect size in small samples (using Hedges' *g*).
3. Weighted mean effect sizes and 95% confidence intervals (CIs) were computed. The significance of the mean was tested by dividing the weighted mean effect size by the standard error of the mean. To interpret the practical significance of the results, we used the Binomial Effect Size Display (BESD; Rosenthal & Rubin, 1982) and Cohen's criteria (Cohen, 1992). According to Cohen, differences of $d \geq 0.8$ are interpreted as large, of $d = .50–.79$ as medium, and of $d = .20–.49$ as small.
4. Homogeneity of effect sizes was computed by use of the *Q*-statistic.
5. The fail-safe *N* was computed to estimate the numbers of additional studies with null results needed to reduce significant effect sizes to a nonsignificant level (Rosenberg, 2005).
6. To test the influence of moderator variables, we used an analog of analysis of variance and weighted ordinary least-squares regression analyses.

Results

Data from 31,288 children with a chronic illness were included (*N*s varied between 4 and 1,528 per study). The children had a mean age of 10.38 years (*SD* = 4.37); 46.8%

Table I. *Differences Between Quality of the Parent–Child Relationship and Parenting in Families With and Without a Child With Physical Chronic Illness*

Variables	*k*	*g*	95% CI		*Z*	Fail-safe *N*	*Q*
			Lower limits	Upper limits			
Parent–child relationship	220	−.16	−.22	−.10	−5.54***	3,686	1,163.57***
Parental responsiveness	153	−.22	−.28	−.15	−6.55***	2,478	849.63***
Parental demandingness	143	.18	.09	.26	4.21***	978	1,215.99***
Parental overprotection	81	.39	.29	.50	7.24***	1,341	517.22***
Authoritative parenting	5	−.13	−.22	−.04	−2.88**	6	4.08
Authoritarian parenting	8	.24	.03	.45	2.24*	14	71.06***
Permissive parenting	5	.02	−.07	.12	0.20		7.36
Neglectful parenting	6	.51	.03	.99	2.07*	3	33.65***

Note. *k* = number of studies; *g* = effect size (scores > 0 indicate higher levels of the variable in families with a child with chronic illness); 95% CI = lower and upper limits of 95% confidence interval; *Z* = test for significance of *g*; fail-safe *N* = number of additional null results needed for making significant results nonsignificant; *Q* = test for homogeneity of effect sizes.

*$p < .05$, **$p < .01$, ***$p < .001$.

were girls, and 29.5% were members of ethnic minorities. The children most often had cerebral palsy/spina bifida ($N = 4{,}068$), asthma ($N = 3{,}038$), diabetes ($N = 1{,}984$), and heart diseases ($N = 1{,}489$). The mean duration of the illness was 5.2 years ($SD = 3.8$). The parents had a mean age of 36.7 years ($SD = 4.9$), and 74% of the data referred to mothers.

In the first analyses, we tested whether children with a chronic illness differed, on average, from their healthy peers with regard to the quality of the parent–child relationship, parental responsiveness, demandingness, overprotection (lack of autonomy support), and parenting styles. The analyses indicate that six out of eight effect sizes were heterogeneous (Table I). Heterogeneity of effect sizes is commonly observed when integrating the results from a large number of studies, and random-effects meta-analysis takes this heterogeneity into account when testing for statistical significance of mean effect sizes (Lipsey & Wilson, 2001). Nonetheless, heterogeneity indicates that the average effect sizes do not adequately capture the findings of some subgroups of studies, such as individual diseases, age groups, or measures used.

Studies on the quality of the parent–child relationship assessed connectedness of the parent–child dyad, such as closeness, secure attachment, positive communication, joint positive activities, and lack of conflict (Clark & Ladd, 2000). As shown in Table I, the quality of the parent–child relationship was, on average, less positive if the child has a chronic physical illness ($g = -.16$). As the effect size does not reach Cohen's threshold of small effects (Cohen, 1992), it could be interpreted as very small. In addition, parents of children with a chronic illness showed, on average, less warmth toward their children than parents of healthy children ($g = -.22$)—a small difference. Furthermore, parents of children with a chronic illness were, on average, more controlling, but the difference was very small ($g = .18$). Moreover, these parents showed, on average, higher levels of overprotection ($g = .39$)—a small difference. According to the BESD, 59.6% of the parents of a child with chronic illness could be expected to show overprotection above the median of the total sample, as compared with 40.4% of parents of healthy children. With regard to quality of the parent–child relationship (where the smallest between-group difference was found), 54% of parents of children with a chronic illness and 46% of other parents could be expected to score above the median level. The fail-safe *N* indicates that 978 (demandingness) to 3,686 studies (parent–child relation) with null results would be needed for reducing the significant effect sizes to a nonsignificant level. As indicated by the nonoverlap of the 95% CIs, group differences were larger with regard to parental overprotection than with regard to responsiveness, demandingness, and quality of the parent–child relationship.

Few studies identified parenting styles based on the combination of demandingness and responsiveness or by the use of sum scales of parenting styles. Three significant between-group differences emerged: Parents of a child with a chronic illness were, on average, more likely to show neglectful (low responsiveness and demandingness; $g = .51$) and authoritarian parenting (low responsiveness and high demandingness; $g = .24$), and less likely to show authoritative parenting (high responsiveness and demandingness) than other parents ($g = -.12$).

Moderating Effects of Illness Characteristics

Six out of eight effect sizes were found to be heterogeneous, indicating the need to search for moderating

variables. Moderator analyses were restricted to the three outcomes for which the largest numbers of effect sizes were available—quality of the parent–child relationship, responsiveness, and demandingness. Moderator analyses were computed on subgroups in which there were at least three studies (Riley, Higgins, & Deeks, 2011). With one exception, significant effect sizes for individual diseases were only found if nine or more studies were combined. Thus, some other effect sizes might not have reached statistical significance owing to lower numbers of available studies and reduced test power.

As indicated by a significant *Q*-test, the quality of the parent–child relationship varied by kind of illness (Table II). The largest reduction in relationship quality was observed in children with epilepsy—a large effect size ($g = -.87$). According to the BESD, 70% of families with a child with epilepsy are expected to be in the group with below-median levels of positive parent–child relationship as compared with 30% of families with healthy children. In addition, a moderate effect size was found for children with hearing impairment ($g = -.56$). Furthermore, significant small reductions of the quality of the parent–child relationship were observed in children with asthma ($g = -.32$) and diabetes ($g = -.23$). According to fail-safe *N*, 13–65 additional studies with null results would be needed to eliminate the observed significances. As indicated by nonoverlapping 95% CIs, effect sizes were larger for epilepsy and hearing impairment than for cancer, cleft lip/palate, cerebral palsy/spina bifida, and visual impairment. Effect sizes were also larger for epilepsy than for arthritis and cystic fibrosis.

As indicated by the *Q*-statistics, levels of parental responsiveness did not vary significantly between the compared diseases. Compared with families with healthy children, parental responsiveness was significantly lower toward children with epilepsy ($g = -.54$), hearing impairment ($g = -.38$), asthma ($g = -.31$), cleft lip ($g = -.25$), and the sum category of other/mixed diseases ($g = -16$).

The level of parental demandingness did not vary significantly between diseases. Parents of children with epilepsy ($g = .40$), asthma ($g = .24$), hearing impairment ($g = .23$), and the sum category of other/mixed diseases ($g = .31$) showed higher levels of demandingness than parents of children without chronic illness.

The quality of the parent–child relationship varied by duration of illness, and significant reductions of relationship quality were only observed if the illness lasted <3 years ($g = -.25$). No such moderating effect was found for parental responsiveness and demandingness.

Moderating Effects of Sociodemographic Variables and Study Characteristics

Moderating effects of child age were observed for parental responsiveness and demandingness. Reductions of responsiveness were larger in parents of children (<10 years of age; $g = -.33$) than in parents of adolescents ($g = -.09$). Similarly, elevated levels of demandingness were observed in parents of ill children ($g = .27$) rather than ill adolescents ($g = .05$). However, child age did not moderate the effect sizes with regard to parent–child relationship. Similarly, no significant moderating effects of child and parental gender, ethnicity, and country were found.

Moderator analysis showed that the levels of the three outcome variables varied by source of information. Stronger between-group differences were found when observer ratings were used ($g = -.44$ to $.34$) than when parent or child ratings were used ($g = -.10$ to $.16$).

With regard to the quality of the parent–child relationship, we found a moderating effect of target of comparison. Larger effect sizes were found if children with a chronic physical illness were compared with healthy peers ($g = -.26$) rather than with test norms ($g = -.06$). However, the effect sizes did not vary between published and unpublished studies or by year of publication. There were also no moderating effects of publication status, year of publication/presentation, sociodemographic equivalence of the patient group and control group, and representativeness of the sample.

A significant moderating effect of method of assessment was found for the quality of parent–child relationship ($Q = 18.16$, $p < .05$), parental responsiveness ($Q = 27.58$, $p < .001$), and demandingness ($Q = 6.09$, $p < .05$). The quality of the relationship of children with a chronic illness was more negative when behavior observations were used ($g = -42$, 95% CI = −.69 to −.14) than when the Pictorial Scale of Perceived Competence and Social Acceptance for Young Children (Harter & Pike, 1984; $g = .12$, 95% CI = −.12 to .36) was used.

Parental responsiveness was lower toward children with chronic illness if observational measures were used ($g = -.40$, 95% CI = −.52 to −.28) than if questionnaires were used ($g = -.11$, 95% CI = −.18 to −.04). The same difference was found for parental demandingness ($g = .36$, 95% CI = .18 to .53 vs. $g = .10$, 95% CI = .02 to .19).

Results of Regression Analyses

In the final step of analysis, we tested whether the significant univariate moderator variables remained significant in multivariate analysis. Dummy variables were built for rater (observer rating = 1, child/parent ratings = 0) and type of

Table II. *Test for Moderating Effects*

	Parent–child relationship							Parental responsiveness							Parental demandingness						
			CI							CI							CI				
Moderator variables	*k*	*g*	Lower limits	Upper limits	*Z*	*fsN*	*Q*	*k*	*g*	Lower limits	Upper limits	*Z*	*fsN*	*Q*	*k*	*g*	Lower limits	Upper limits	*Z*	*fsN*	*Q*
Illness characteristics																					
Kind of illness							33.94**							14.58							10.14
Asthma	15	−.32	−.53	−.11	−2.95**	53	13.68	18	−.31	−.50	−.11	−3.09**	58	15.81	19	.24	.02	.46	2.18*	29	13.29
Arthritis	5	.01	−.36	.37	.03		.67								7	−.09	−.28	.46	.49		4.39
Cancer	23	−.06	−.24	.12	−.69		19.77	5	−.07	−.41	.27	−.39		5.57	6	.01	−.38	.40	.09		3.44
Cleft lip	11	−.00	−.25	.25	−.01		10.25	16	−.25	−.46	−.04	−2.35*	21	12.92	7	.06	−.32	.44	.32		1.15
Cerebral palsy/spina bifida	24	−.12	−.28	.05	−1.39		14.80	14	−.17	−.38	.04	−1.58		6.61	13	.18	−.09	.45	1.29		21.29*
Cystic fibrosis	16	−.10	−.33	.12	−.92		14.09	5	−.15	−.55	.24	−.75		1.47	4	−.20	−.70	.31	−.77		2.17
Diabetes	16	−.23	−.43	−.04	−2.39*	40	12.56	9	−.19	−.45	.06	−1.50		1.85	18	.05	−.17	.27	.44		25.74
Epilepsy	3	−.87	−1.35	−.39	−3.55***	13	2.86	9	−.54	−.80	−.28	−4.02[s]	33	7.42	9	.40	.08	.72	2.47*	10	6.97
Growth hormone deficits	13	−.15	−.40	.10	−1.19		25.68**	–							–						
Heart disease	3	−.28	−.81	.25	−1.05		1.16	7	.15	−.14	.45	1.01		5.41	6	−.05	−.44	.33	−.27		6.64
Hearing impairment	11	−.56	−.82	−.29	−4.15***	65	9.98	20	−.38	−.58	−.17	−3.63***	80	23.13	18	.23	.01	.45	2.03*	3	24.22
HIV-infection	9	−.31	−.58	−.04	−2.22*	19	14.38	–							–						
IBD	3	−.43	−.99	.14	−1.46		.98	–							–						
Kidney/liver disease	5	.36	−.07	.79	1.64		1.33	–							–						
Sickle cell disease	8	−.25	−.54	.04	−1.66		3.54	–							5	.18	−.26	.62	.81		2.58
Visual impairment	13	−.03	−.25	.19	−.27		24.03*	6	−.18	−.53	.17	−1.00		12.31*	4	.24	−.33	.80	.82		4.83
Others	42	−.11	−.24	.02	−1.76		36.11	44	−.16	−.28	−.05	−2.73**	110	60.59*	27	.31	.12	.50	3.26**	39	22.61
Duration of illness							4.05*							1.28							.23
<Median (3 years)	42	−.25	−.38	−.12	−3.87***	201	44.05	36	−.33	−.48	−.18	−4.28***	246	29.33	25	.18	−.05	.41	1.57		24.47
≥Median	50	−.07	−.19	.04	−1.23		51.11	32	−.20	−.36	−.05	−2.59*	30	35.45	37	.11	−.07	.29	1.22		35.03
Sociodemographic characteristics																					
Mean age							.00							12.77**							6.68**
<Median (10 years)	83	−.16	−.26	−.06	−3.09**	418	97.69	82	−.33	−.42	−.24	−7.19***	1,663	80.14	76	.27	.16	.39	4.59***	746	85.44
≥Median	131	−.16	−.24	−.09	−4.17***	1,147	109.70	66	−.09	−.19	.01	−1.83		61.36	67	.05	−.07	.16	.85		52.53
Percentage of female children							2.59							3.13							.08
<Median (47%)	84	−.21	−.31	−.11	−4.09***	780	70.22	66	−.16	−.26	−.06	−3.04**	223	72.50	58	.11	−.02	.24	1.73		59.06
≥Median	102	−.10	−.19	−.01	−2.13*	368	109.70	52	−.30	−.41	−.18	−5.00***	605	45.07	54	.09	−.05	.22	1.29		51.36
Distribution of fathers and mothers							2.62							3.14							.47
Fathers	10	−.18	−.45	.08	−1.36		4.98	16	−.19	−.41	−.02	−1.78		14.09	11	.09	−.22	.40	.56		6.15
Mixed samples	163	−.13	−.20	−.06	−3.66***	1,393	178.40	69	−.15	−.25	−.05	−2.93**	274	66.03	76	.19	.08	.30	3.25***	390	80.14
Mothers	47	−.25	−.38	−.12	−3.84***	329	28.17	51	−.25	−.36	−.14	−4.61***	733	67.57	56	.15	.00	.29	2.00*	57	51.25
Percentage of ethnic minority							.15							1.36							.43
<Median (22%)	28	−.11	−.31	.08	−1.15		28.14	21	−.35	−.50	−.19	−4.45***	122	10.23	21	.16	−.06	.38	1.41		23.01

(continued)

Table II. *Continued*

Moderator variables	Parent–child relationship							Parental responsiveness							Parental demandingness						
			CI							CI							CI				
	k	*g*	Lower limits	Upper limits	*Z*	*fsN*	*Q*	*k*	*g*	Lower limits	Upper limits	*Z*	*fsN*	*Q*	*k*	*g*	Lower limits	Upper limits	*Z*	*fsN*	*Q*
≥Median	24	−.17	−.39	.05	−1.53		22.54	29	−.23	−.35	−.11	−3.76***	213	30.24	23	.06	−.15	.27	.53		19.05
Country							1.70							.35							.04
Developing countries	20	−.28	−.46	−.09	−2.92**	105	17.82	26	−.16	−.34	.02	−1.74		46.05**	20	.14	−.10	.39	1.15		21.81
Developed countries	200	−.15	−.21	−.08	−4.56***	2,363	195.86	127	−.22	−.29	−.14	−5.66***	1,929	103.12	123	.17	.08	.26	3.62***	786	115.62
Study characteristics																					
Rater							9.65**							15.85***							6.73*
Child	162	−.11	−.17	−.04	−3.09***	933	173.48	40	−.14	−.27	−02	−2.35*	90	45.85	44	.07	−.07	.21	.95		35.60
Parent	16	−.10	−.30	.10	−.96		6.06	69	−.12	−.22	−.02	−2.39*	111	74.74	69	.16	−.03	.28	.50*		80.49
Observer	37	−.35	−.50	−.21	−4.85***	352	25.05	44	−.44	−.58	−.31	−6.50***	659	26.70	30	.36	.18	.56	3.68***	136	21.53
Target of comparison							10.95**							.41							.33
Control group	110	−.26	−.34	−.18	−6.10***	2,306	110.37	110	−.20	−.28	−.11	−4.65***	980	108.92	98	.15	.05	.25	2.82**	278	61.59
Norms	110	−.06	−.14	.02	−1.40		98.75	43	−.25	−.38	−.12	−3.70***	293	41.37	45	.20	.05	.35	2.61**	154	66.15*
Publication status							1.15							.23							.04
Unpublished	26	−.25	−.43	−.07	−2.79**	96	25.99	17	−.15	−.39	.08	−1.27		11.57	17	.14	−.13	.41	.99		15.03
Published/in press	194	−.15	−.21	−.08	−4.56***	2,456	187.16	136	−.22	−.29	−.14	−5.77***	2,600	137.93	126	.17	.08	.26	3.66***	802	122.35
Year of publication/ presentation							3.22							3.29							.38
<1990	41	−.25	−.40	−.11	−3.37***	187	31.17	54	−.20	−.32	−.08	−3.30***	212	41.36	50	.19	.04	.33	2.43*	72	37.55
1990–1999	50	−.07	−.20	.06	−1.11		63.08*	31	−.34	−.49	−.18	−4.18***	234	19.88	28	.11	−.08	.31	1.13		25.01
≥2000	129	−.16	−.24	−.09	−4.28***	1,668	119.10	68	−.16	−.26	−.06	−3.19**	283	87.66	65	.17	.05	.30	2.76**	248	74.76
Equivalence of patients and control group							.12							.46							5.85
No	13	−.12	−.37	.13	−.96		7.04	17	−.17	−.37	.03	−1.66		14.26	13	−.04	−.31	.23	.27		4.44
Yes	67	−.17	−.28	−.06	−2.99**	212	55.88	68	−.19	−.30	−.09	−3.58***	289	58.74	62	.10	−.03	.23	1.47		38.39
Not tested	140	−.16	−.24	−.09	−4.25***	1,754	149.71	68	−.24	−.34	−.13	−4.45***	656	67.08	68	.27	.14	.39	4.31**	632	94.67**
Representativeness of the sample							.16							2.26							1.20
Convenience sample	209	−.16	−.23	−.10	−5.15***	3,151	205.83	145	−.22	−.30	−.15	−6.12***	2,424	148.25	134	.18	.09	.27	3.96***	976	135.53
Random community sample	11	−.11	−.35	.12	−.95		7.66	8	−.02	−.28	.24	−.14		1.85	9	.00	−.30	.31	.02		1.96

Note. *k* = number of studies; *g* = effect size; 95 % CI = lower and upper limits of 95% confidence interval; *Z* = test for significance of *g*; *fsN* = fail-safe *N*; *Q* = test for homogeneity of effect sizes. Significant score indicate heterogeneity. IBD = inflammatory bowel disease.

*$p < .05$, **$p < .01$, ***$p < .001$.

illness. In the regression analysis of predictors of relationship quality, we compared the illnesses with moderate to large effect sizes (epilepsy, hearing impairment = 1) against other illnesses (=0). Illness duration could not be included as a predictor variable owing to very large numbers of missing values.

In the regression analysis on relationship quality, we found that kind of illness ($B = -.41$, $\beta = -.23$, $t = -3.51$, $p < .001$) and target of comparison (healthy peers vs. test norm; $B = -.10$, $\beta = -.12$, $t = -2.06$, $p < .05$) remained significant moderator variables. However, the moderating effect of rater was no longer significant. In the regression analysis on parental responsiveness, we found that the effect of rater ($B = -.18$, $\beta = -.20$, $t = -2.49$, $p < .05$) and child age ($B = .17$, $\beta = .21$, $t = 2.60$, $p < .05$) remained significant. The regression analysis of predictors of parental demandingness showed that the effect of rater remained significant ($B = .17$, $\beta = .20$, $t = 2.06$, $p < .05$), whereas the effect of child age was lost in multivariate analysis.

Discussion

The present meta-analysis is the first to compare the quality of the parent–child relationship as well as parenting dimensions and styles in families with and without a child with a chronic physical illness. Differences between the quality of the parent–child relationship and parenting between families with and without chronic illness were found for some diseases but not for others. Most effect sizes were small or very small. The size of between-group differences also varied, in part, by rater, target of comparison, child age, and duration of illness.

Given the fact that most between-group differences were small or even very small in a statistical sense (Cohen, 1992), one could ask whether the size of these average differences was of practical importance. However, even in the case of very small between-group difference, the binomial effect size display indicated that there was an 8% difference when comparing families with above-average quality of parent–child relationship caring for a child with versus without chronic illness.

The observed average differences were strongest with regard to parental overprotection and neglectful parenting. Overprotective parents are vigilant, have difficulty with separation, exercise a high level of control, and discourage independent behavior (Thomasgard et al., 1995). Elevated levels of (over)protection in parents of children with chronic physical illness may result from child vulnerability (Mullins et al., 2004) and reduced competence of the child (Holmbeck et al., 2002). Overprotection in a narrow sense is found if children would, in principle, be able to behave independently. Anderson and Coyne (1993) proposed the concept of miscarried helping: Parental helping and protection may initially serve a practical function but could spill over to areas where no help or protection is actually needed or could be maintained despite increasing competence of the child. Thus, it would have to be assessed for each child individually whether the level of parental protection was adequate or excessive. Available comparative quantitative studies probably mix cases of adequately high protection (due to increased child vulnerability or reduced competence) and overprotection, thus leading to higher effect sizes than in analyses of parental demandingness and responsiveness. Although some studies have found negative effects of parental (over)protection on young people with chronic illness (e.g., Mullins et al., 2004), elevated levels of parental protection and control could be helpful in the case of a strict treatment regimen as long as the child is not yet able to perform adequate self-care.

Data on neglectful parenting were available for only six samples. More research would be needed before final conclusions about the prevalence of this parenting style in families with a chronically ill child can be drawn.

The Role of Illness Characteristics

Significant between-group differences in all three main outcome variables were found with regard to asthma, epilepsy, and hearing impairment, while families with a child with cleft lip, diabetes, and HIV infection differed with regard to one variable. Given the rather low numbers of available studies for many illnesses (e.g., inflammatory bowel disease, sickle cell disease) and the fact that kind of illness did not moderate between-group differences in parental responsiveness and demandingness, additional between-group differences are likely to become statistically significant if more studies become available and test power increases.

The results on hearing impairment and epilepsy support the suggestion that changes in parenting and parent–child relations are more likely to be observed if the illness is associated with more stressors (such as behavior problems of the child and communication problems or need for supervision of medication, respectively). Illness-specific stressors and demands are also relevant for other diseases, such as the need for supervision of medication (asthma, diabetes), environmental risk factors (asthma), or nutrition and physical activity (diabetes).

We found empirical support for the suggestion that longer illness duration gives more time for adaptation to

the illness with regard to one out of three outcomes. Because illness duration was rarely reported in studies on parenting, we probably had not enough test power for identifying additional moderating effects of this variable.

The Role of Sociodemographic Characteristics

In families facing chronic illness, parents were relatively less responsive and more controlling when caring for a child than when caring for an adolescent. This may be related to higher demands of parents caring for children with chronic illness than for such adolescents (Teubert & Pinquart, 2013).

However, child and parental gender as well as ethnicity did not moderate the size of between-group differences. This indicates that our results were robust with regard to most sociodemographic characteristics of the samples.

Effects of Study Characteristics

The present meta-analysis supports the suggestion by Noll et al. (1997) that larger differences between parenting in families with and without chronic illness would be found in observational studies than in studies using parental self-reports. As the same was true when comparing observations and child reports, both parents and the child with chronic illness may wish to provide a positive picture of their family when asked to describe the parent–child relationship and parental behaviors.

There was some evidence for the suggestion that comparisons of families with a child with chronic illness against general test norms underestimate the size of between-group differences because norm populations include some families with ill children, whereas healthy control groups do not. However, we neither found empirical evidence for the suggested lower effect sizes of unpublished studies as compared with published studies nor for lower effect sizes of more recent studies. Two factors may explain the lack of moderating effect of publication status: First, as unpublished studies are difficult to detect, we might also have missed some of those with larger effect sizes. Second, a nonsignificant result might often remain unpublished only if the paper is mainly focused on that result (Lipsey & Wilson, 2001). Many included papers dealt with other main research questions, such as associations of parenting with child outcomes. Thus, many results have been published even if not being statistically significant. The lack of moderating effect of year of publication indicates that the observed differences between families with and without chronic illness persisted over the past decades. Because the observed between-group differences did not vary by sociodemographic equivalence of patient and control group and by representativeness of the sample, we conclude that the effects are robust with regard to these criteria of quality of the study.

Limitations and Conclusions

Some limitations of the present meta-analysis have to be mentioned. First, although demandingness, responsiveness, and autonomy support (vs. overprotection) are probably the most often assessed dimensions of parenting (e.g., Maccoby & Martin, 1983; Steinberg, 2010), there are other dimensions that were not included in the present meta-analysis owing to the small number of available studies (e.g., consistency, coparenting). We also did not meta-analyze between-group differences in parenting stress, which are the topic of another paper (Teubert & Pinquart, 2013). Second, we did not analyze illness-specific parental behaviors that could not be meaningfully compared with behaviors of parents with healthy children (e.g., control over medication). Third, numbers of studies were low for parenting styles. Finally, the meta-analysis focused on concurrent associations of chronic illness with parent–child relationship and parenting. Thus, we could not test whether parenting characteristics are consequences or precursors of the chronic illness. Although there are many theoretical reasons for suggesting effects of child illness on the family system, the reverse may be found in some cases. Similarly, there are common risk factors for chronic illness as well as poor parent–child relationship and parenting, such as low socioeconomic status (Margolis et al., 1992; Steinberg, 2010).

Despite these limitations, some conclusions can be drawn from the present meta-analysis. First, with regard to future research needs, more prospective studies are recommended that relate the onset of a child illness with change in parenting and quality of the parent–child relationship. Second, more studies comparing parenting styles in families with and without children with chronic illness are recommended. Third, further research is needed with regard to types of chronic illness that have rarely been addressed in research on parenting and the parent–child relationship (see Table II). Fourth, given the fact that most effect sizes were small to very small and no significant differences emerged for many chronic diseases, the present study indicates that most families adapt well to the chronic illness of a child and establish a parent–child relationship and parenting behaviors that are in most cases as positive as in families with healthy children. Fifth, as consistent between-group differences across the assessed outcome variables appeared in families of children with epilepsy, hearing impairment, and asthma, we conclude that these

families would be most likely to benefit from intervention aimed at improving the parent–child relationship and parenting behaviors. However, the sizes of the effects indicate that only some of these families would need these interventions, as even in the case of the largest effect size (parent–child relation of children with epilepsy), only 70% of the families were expected to show below-median levels of relationship quality. Screenings are recommended for identifying families in need for these interventions. Johnson, Kent, and Leather (2005) reviewed interventions aimed at strengthening the parent–child relationship, such as parent training. Although these interventions have seldom been applied to pediatric settings, they could, in principle, be used in families with a child with chronic physical illness (Johnson et al., 2005). Our results indicate that in these interventions, there may be a greater need to address overprotection than responsiveness or demandingness. Interventions may help with finding a good balance between autonomy needs of the child and the needs for an effective illness management.

Supplementary Data

Supplementary data can be found at: http://www.jpepsy.oxfordjournals.org/

Conflicts of interest: None declared.

References

Ainsworth, M. D., Blehar, M. C., Waters, E., & Wall, S. (1978). *Patterns of attachment*. Hillsdale, NJ: Erlbaum.

Anderson, B. J., & Coyne, J. C. (1993). Family context and compliance behavior in chronically ill children. In N. A. Krasnegor, L. Epstein, S. B. Johnson, & S. J. Yaffe (Eds.), *Developmental aspects of health compliance behavior* (pp. 77–89). Hillsdale, NJ: Erlbaum.

Arnold, D. S., O'Leary, S. G., Wolff, L. S., & Acker, M. M. (1993). The Parenting Scale: A measure of dysfunctional parenting in discipline situations. *Psychological Assessment, 5*, 137–144.

Baumrind, D. (1967). Child care practices anteceding three patterns of preschool behavior. *Genetic Psychology Monographs, 75*, 43–88.

Bleyer, W. A. (2002). Cancer in older adolescents and young adults. *Medical and Pediatric Oncology, 38*, 1–10.

Block, J.H. (1981). *The child rearing practices report (CRPR):* A set of Q items for the description of parental socialization attitudes and values. *Unpublished manuscript, Department of Psychology, University of California, Berkeley, CA.*

Cappelli, M., McGrath, P. J., MacDonald, N. E., Katsanis, J., & Lascelles, M. (1989). Parental care and overprotection of children with cystic fibrosis. *British Journal of Medical Psychology, 62*, 281–289.

Carpentier, M. Y., Mullins, L. L., Wolfe-Christensen, C., & Chaney, J. M. (2008). The relationship of parent self-focused negative attributions to ratings of parental overprotection, perceived child vulnerability, and parenting stress. *Families, Systems, and Health, 26*, 147–163.

Clark, K. E., & Ladd, G. W. (2000). Connectedness and autonomy support in parent–child relationships: Links to children's socioemotional orientation and peer relationships. *Developmental Psychology, 36*, 485–498.

Coffey, J. S. (2006). Parenting a child with chronic illness: A metasynthesis. *Pediatric Nursing, 32*, 51–59.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*, 155–159.

Davis, C. L., Delamater, A. M., Shaw, K. H., La Greca, A. M., Eidson, M. S., Perez-Rodriguez, J. E., & Nemery, R. (2001). Parenting styles, regimen adherence, and glycemic control in 4- to 10-year old children with diabetes. *Journal of Pediatric Psychology, 26*, 123–129.

Devine, K. A., Holbein, C. E., Psihogios, A. M., Amaro, C. M., & Holmbeck, G. N. (2012). Individual adjustment, parental functioning, and perceived social support in Hispanic and non-Hispanic white mothers and fathers of children with spina bifida. *Journal of Pediatric Psychology, 37*, 769–778.

Drotar, D. (1992). Integrating theory and practice in psychological intervention with families of children with chronic illness. In T. J. Akamatsu, M. A. P. Stephens, S. E. Hobfoll, & J. H. Crowther (Eds.), *Family health psychology* (pp. 175–192). Washington, DC: Hemisphere.

Ellis, D. A., Podolski, C. L., Frey, M., Naar-King, S., Wang, B., & Moltz, K. (2007). The role of parental monitoring in adolescent health outcomes: Impact on regimen adherence in youth with type 1 diabetes. *Journal of Pediatric Psychology, 32*, 907–917.

Harter, S., & Pike, R. (1984). The pictorial scale of perceived competence and social acceptance for young children. *Child Development, 55*, 1969–1982.

Herman, M. R., Dornbusch, S. M., Herron, M. C., & Herting, J. R. (1997). The influence of family regulation, connection, and psychological autonomy on six

measures of adolescent functioning. *Journal of Adolescent Research, 12*, 34–67.

Holmbeck, G. N., Johnson, S. Z., Wills, K. E., McKernon, W., Rose, B., Erklin, S., & Kemper, T. (2002). Observed and perceived parental overprotection in relation to psychosocial adjustment in preadolescents with a physical disability: The mediational role of behavioral autonomy. *Journal of Consulting and Clinical Psychology, 70*, 96–110.

Johnson, G., Kent, G., & Leather, J. (2005). Strengthening the parent–child relationship: A review of family interventions and their use in medical settings. *Child: Care, Health and Development, 31*, 25–32.

Koinis-Mitchell, D., McQuaid, E. L., Jandasek, B., Kopel, S. J., Seifer, R., Klein, R. B., … Fritz, G. K. (2012). Identifying individual, cultural and asthma-related risk and protective factors associated with resilient asthma outcomes in urban children and families. *Journal of Pediatric Psychology, 37*, 424–427.

Lamb, M. E., & Lewis, C. (2011). The role of parent-child relationships in child development. In M. E. Lamb, & M. H. Bornstein (Eds.), *Social and personality development: An advanced textbook* (pp. 259–307). New York, NY: Psychology Press.

Lim, J. H., Wood, B. L., & Miller, B. D. (2008). Maternal depression and parenting in relation to child internalizing symptoms and asthma disease activity. *Journal of Family Psychology, 22*, 264–273.

Lipsey, M. W., & Wilson, D. B. (2001). *Practical meta-analysis*. Thousand Oaks, CA: Sage.

Luyckx, K., Goossens, E., Missotten, L., & Moons, P. (2011). Adolescents with congenital heart disease: The importance of perceived parenting for psychosocial and health outcomes. *Journal of Developmental and Behavioral Pediatrics, 32*, 651–659.

Maccoby, E. E., & Martin, J. A. (1983). Socialization in the context of the family: Parent-child interaction. In P. H. Mussen (Ed.), *Handbook of child psychology* (Vol. Vol. 4, pp. 1 (pp. 1–101). New York, NY: Wiley.

Margolis, P. A., Greenberg, R. A., Keyes, L. L., LaVange, L. M., Chapman, R. S., Denny, F. W., … Boat, B. W. (1992). Lower respiratory illness in infants and low socioeconomic status. *American Journal of Public Health, 82*, 1119–1126.

Meadow-Orlans, K. P., Spencer, P. E., & Koester, L. S. (2004). *The world of deaf infants: A longitudinal study*. New York, NY: Oxford University Press.

Mullins, L. L., Fuemmeler, B. F., Hoff, A., Chaney, J. M., Van Pelt, J., & Ewing, C. A. (2004). The relationship of parental overprotection and perceived child vulnerability to depressive symptomatology in children with type 1 diabetes mellitus: The moderating influence of parenting stress. *Children's Health Care, 33*, 21–34.

Noll, R. B., McKellop, J. M., Vannatta, K., & Kalinyak, K. (1997). Child rearing practices of primary caregivers of children with sickle cell disease: The perspective of professionals and parents. *Journal of Pediatric Psychology, 23*, 131–140.

Offer, D., Ostrov, E., Howard, K. I., & Dolan, S. (1992). *Offer Self-Image Questionnaire, Revised*. Los Angeles, CA: Western Psychological Services.

Ouvinen-Birgerstam, P. (1985). *Jag tycker jag är, manual* [I think I am manual], Stockholm, Psykologiförlaget.

Parker, G. (1990). The Parental Bonding Instrument: A decade of research. *Social Psychiatry and Psychiatric Epidemiology, 25*, 281–282.

Pinquart, M., & Shen, Y. (2011). Behavior problems in children and adolescents with a chronic physical illness: A meta-analysis. *Journal of Pediatric Psychology, 36*, 1003–1016.

Power, N., & Franck, L. (2008). Parent participation in the care of hospitalized children: A systematic review. *Journal of Advanced Nursing, 62*, 622–641.

Ravens-Sieberer, U. (2006). *The KIDSCREEN Questionnaires - Quality of life questionnaires for children and adolescents – Handbook*. Lengerich, Germany: Papst.

Reynolds, C. R., & Kemphaus, R. W. (1992). *Behavior Assessment System for Children (BASC)*. Minneapolis, MN: AGS Inc.

Riley, R. D., Higgins, J. P., & Deeks, J. J. (2011). Interpretation of random effects meta-analyses. *BMJ, 342*, d549.

Rogers, S. J. (1988). Characteristics of social interactions between mothers and their disabled infants: A review. *Child Care, Health and Development, 14*, 301–317.

Rosenberg, J. M., Kapp-Simon, K., Starr, J., Cradock, M. M., & Speltz, M. L. (2011). Mothers' and fathers' reports of stress in families of infants with and without single-suture craniosynostosis. *Cleft Palate Cranofacial Journal, 48*, 509–518.

Rosenberg, M. (2005). The file-drawer problem revisited: A general weighted method for calculating fail-safe numbers in meta-analysis. *Evolution, 59*, 464–468.

Rosenthal, R., & Rubin, D. B. (1982). A simple general purpose display of magnitude of experimental effect. *Journal of Educational Psychology, 74*, 166–169.

Schaefer, E. S. (1965). Children's reports of parental behavior: An inventory. *Child Development, 36*, 413–424.

Sloper, P. (2000). Predictors of distress in parents of children with cancer: A prospective study. *Journal of Pediatric Psychology, 25*, 79–91.

Steinberg, L. (2010). *Adolescence* (9th ed.). New York, NY: McGraw-Hill.

Tartakovsky, E., & Hamama, L. (2011). Mothers' acceptance-rejection of their children infected with HIV: The role of the mothers' social axioms, psychological distress, and relationships with the partner. *Journal of Pediatric Psychology, 36*, 1030–1042.

Teubert, D., & Pinquart, M. (2013). Belastungen der Eltern chronisch körperlich kranker Kinder [Stress in parents of children with a chronic illness]. In M. Pinquart (Hrsg.) (Ed.), *Wenn Kinder und Jugendliche körperlich chronisch krank sind: Psychische und soziale Entwicklung, Prävention, Intervention* (pp. 83–99). Berlin, Germany: Springer.

Thomasgard, M., Metz, W. P., Edelbrock, C., & Shonkoff, J. P. (1995). Parent-child relationship disorders. Part I. Parental overprotection and the development of the Parent Protection Scale. *Journal of Developmental and Behavioral Pediatrics, 16*, 244–250.

Thompson, R. J., & Gustafson, K. E. (1996). *Adaptation to chronic childhood illness*. Washington, DC: American Psychological Association.

Tinsley, B. J., Markey, C. N., Ericksen, A. J., Kwasman, A., & Ortiz, R. V. (2002). Health promotion for parents. In M. H. Bornstein (Ed.), *Handbook of parenting* (pp. 311–328). Hillsdale, NJ: Lawrence Erlbaum.

Triandis, H. C. (2001). Individualism-collectivism and personality. *Journal of Personality, 69*, 907–924.