

Pediatric Parenting Stress Among Parents of Children with Type 1 Diabetes: The Role of Self-Efficacy, Responsibility, and Fear

Randi Streisand,¹ PhD, Erika Swift,² PhD, Tara Wickmark,³ BA, Rusan Chen,³ PhD, and Clarissa S. Holmes,^{2,4} PhD

¹Children's National Medical Center and George Washington University School of Medicine,

²Georgetown University, ³American University, and ⁴Virginia Commonwealth University

Objective Parents of children with type 1 diabetes are crucial to promoting positive disease adaptation and health outcomes among these youngsters, yet this success may come at some consequence to parents' own well-being. Little research has examined the stress faced by parents, or explored the psychological and behavioral correlates of their stress. **Methods** One hundred and thirty-four parents of children with type 1 diabetes completed measures of diabetes self-efficacy, responsibility for diabetes management, fear of hypoglycemia, and a recently developed measure of pediatric parenting stress (the Pediatric Inventory for Parents [PIP]; R. Streisand, S. Braniecki, K. P. Tercyak, & A. E. Kazak, 2001). **Results** Bivariate analyses suggest that pediatric parenting stress is multifaceted; the frequency of parenting stress is negatively related to child age and family socioeconomic status and positively related to single parent status and regimen status (injections vs. insulin pump). Difficulty of parenting stress is negatively related to child age and positively related to regimen status. In multivariate analyses, a significant portion of the variance in stress frequency (32%) and difficulty (19%) are associated with parent psychological and behavioral functioning, including lower self-efficacy, greater responsibility for diabetes management, and greater fear of hypoglycemia. **Conclusions** Each area of parent functioning associated with pediatric parenting stress is amenable to behavioral intervention aimed at stress reduction or control and improvement of parent psychological and child-health outcomes.

Key words diabetes; parent psychological functioning; parent stress.

The majority of behavioral research within childhood diabetes has focused on children's adjustment to, and coping with, the illness (Kovacs, Goldston, Obrosky, & Bonar, 1997), as well as children's adherence and the relationship between adherence and health outcomes (Couper, Taylor, Foterhingham, & Sawyer, 1999; Grey, Boland, Davidson, Li, & Tamborlane, 2000; Johnson, 1995; Weissberg-Benchell et al., 1995). Although it is generally accepted that childhood diabetes affects, and is affected by, the entire family (Jacobson et al., 1994; Wysocki, Greco, & Buckloh, 2003), little research has specifically focused on parents. This is true despite findings

that such parents are clearly affected by their children's illness (Kovacs et al., 1985, 1990). For example, stress related to caring for a child with diabetes (e.g., the concept of "pediatric parenting stress"; Streisand & Tercyak, 2004; Streisand, Braniecki, Tercyak, & Kazak, 2001) affects both parent and child in several important ways, including (a) increased risk for poor mental health outcomes among parents (Kovacs et al., 1985), (b) potential impairment in parents' ability to learn illness-management skills (Gillis, 1993), (c) increased stress experienced by the affected child (Melamed & Ridley-Johnson, 1988), and (d) a negative influence on children's

All correspondence concerning this article should be addressed to Randi Streisand, Department of Psychiatry and Behavioral Sciences, Children's National Medical Center, 111 Michigan Avenue, NW, Washington, Federal District of Columbia, 20010. E-mail: rstreis@cnmc.org.

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diabetes self-management (Auslander, Thompson, Dreitzer, & Santiago, 1997; Hanson et al., 1996). Though this research clearly indicates that parent psychological and behavioral functioning are important, little is known about the specific nature of these parents' pediatric parenting stress.

In the few studies that have attempted to examine pediatric parenting stress in this population, reliable and valid measurement of the construct has been limited by the instruments available. For example, these works have primarily been general in nature and relied on measures of overall parenting stress (Hatton, Canam, Thorne, & Hughes, 1995; Powers et al., 2002), rather than examining parenting stress that is specific to children's illness. This is a limitation because illness-related stressors are not assessed by general measures, and illness-related stressors often constitute a significant portion of the total stress experienced by parents of children with illness (Streisand & Tercyak, 2004). Moreover, research examining nonspecific stress and nonspecific parenting stress in pediatric populations has focused on the relationship between parents' general psychological functioning and child health, as typified by studies assessing parent stress and its impact on child hemoglobin A1C values (a biological measure of blood glucose control) (Guthrie, Sargent, Speelman, & Parks, 1990). Although these efforts are informative, they have not been able to examine the disease-related nature of parent stress or individual parental factors that contribute to and affect the stress they experience related to caring for their child's illness. As there are likely to be several potential contributors to the experience of pediatric parenting stress among parents of children with diabetes, a more specific understanding of the roles of the family and parenting behavior in diabetes management may be necessary (Anderson, Ho, Brackett, Finkelstein, & Laffel, 1997).

One of the most well-conceptualized and applicable frameworks for conducting pediatric behavioral diabetes research is Johnson's biobehavioral model (1995). In that model, a host of biological and behavioral factors are hypothesized to influence challenges and successes with diabetes management. Factors likely to impact upon this outcome in children include disease knowledge, child adjustment, family and peer relationships, and stress. With respect to family relationships, it is a broad factor that needs to be further deconstructed into its component parts to examine, in a more meaningful way, how each part is interrelated. Based upon the literature, these parts appear to include (a) parent stress associated with caring for a child with diabetes, (b) parental

beliefs about their ability to manage their child's illness (i.e., self-efficacy), (c) the level of parental responsibility for, or involvement in, their child's daily illness management, and (d) parental fear about their child experiencing severely low blood glucose levels (hypoglycemia) (Anderson et al., 1997; Boman, Viksten, Kogner, & Samuelsson, 2004; Landolt, Vollrath, Ribi, Gnehm, & Sennhauser, 2003; Marrero, Guare, Vandagriff, & Fineberg, 1997).

In the general parenting literature, parents' self-efficacy has been found to moderate the effects of parenting stress on parents' mental health outcomes (Kwok & Wong, 2000). In other pediatric populations, such as asthma, lower parental self-efficacy has been associated with increased asthma-related morbidity (Grus et al., 2001). Although research on self-efficacy within the diabetes literature has focused more on the child's self-efficacy rather than parents' self-efficacy for managing their child's illness (Evans & Hughes, 1987), findings from the general parenting and other pediatric literature suggest that increased parent self-efficacy may be related to decreased stress (Grus et al., 2001; Kwok & Wong, 2000). Conversely, given the high level of parental responsibility that is required in caring for type 1 diabetes in children, decreased parent self-efficacy for managing their child's illness could be associated with increased stress. Thus, parental efficacy in managing their child's diabetes is likely associated with pediatric parenting stress.

With regard to parental responsibility for the child's illness management, it is important to note that the medical regimen for diabetes is complex, and recent technology designed to intensify medical regimens and to help youngsters attain near-normal metabolic control has increased this level of complexity even further. Parental involvement in diabetes management has consistently been viewed as an important determinant of positive child-health outcomes (Ingersoll, Orr, Herrold, & Golden, 1986; La Greca et al., 1995), yet as children face more intense regimens at younger ages, more parental involvement is required. Despite research indicating positive associations between parental responsibility and children's health outcomes (Anderson et al., 1997; Ingersoll et al., 1986; La Greca et al., 1995), it is possible that parents with increased responsibility in their child's daily illness management will experience increased stress frequency and difficulty.

Finally, parental fear about a child experiencing hypoglycemia may also be associated with pediatric parenting stress. Hypoglycemia is characterized by a severely low blood glucose level, often accompanied by physical and mental symptoms including shaking, dizziness, hunger,

cognitive dysfunction, and agitation. If recurrent and untreated, severe hypoglycemia can result in irreversible brain damage, coma, or even death. Many individuals with diabetes worry about hypoglycemia, as do many parents of affected children (Marrero et al., 1997). In one study examining parental fear of hypoglycemia, parental worry about diabetes was, not surprisingly, positively associated with fear of hypoglycemia (Marrero et al., 1997). Although the relationship between parental stress and fear of hypoglycemia could not be examined in the study by Marrero et al. (1997), it seems likely that parents with increased diabetes worry and fear of hypoglycemia would also experience increased frequency and difficulty of pediatric parenting stress.

This study attempted to address these issues by focusing on pediatric parenting stress among parents of children with type 1 diabetes and attempted to do so by a specific and highly detailed examination of their stress and its correlates (parental self-efficacy for managing the child's diabetes, parental responsibility for diabetes management, and parental fear related to the child's hypoglycemia). It was hypothesized that parents with lower self-efficacy for diabetes management, less responsibility for their child's diabetes management, and greater fear related to hypoglycemia would report more frequent and more difficult pediatric parenting stress.

Method

Participants

The study sample consisted of 134 parents (M age = 42.3 years, SD = 6.3; 86% female; 79% Caucasian) of 134 children ranging in age from 9 to 17 years (M age = 12.9 years, SD = 2.0) with type 1 diabetes who elected to participate in a longitudinal study of the predictors of diabetes self-care behaviors which, in part, investigates Johnson's biobehavioral model (1995). Data collection for the current study lasted approximately 45 min or less. Participants were parents who self-identified as being the primary caregiver with most responsibility for the child's diabetes management. Participants were, on average, of middle-class socioeconomic status (SES), with a Hollingshead score (Hollingshead, 1975) ranging from 11 to 70 (M = 45.5, SD = 11.9; 46% Class III). Eighty-four percent of parents were married or living as married at the time of the study.

The majority of children were being treated by an intensive diabetes therapy regimen: 44% were prescribed three injections daily, and an additional 20% (n = 27) used continuous subcutaneous insulin infusion (insulin pump therapy). Children checked their blood glucose

levels an average of three times daily (range = 0–5) and on average had fair metabolic control (M hemoglobin A1C = 8.5%, SD = 1.6, range 5.8–14). Per study entry criteria, all children had been diagnosed with diabetes for at least 6 months (M = 4.9 years, Mdn = 4.4 years, range = 6 months to 14 years).

Procedure

Participating families were recruited via specialty outpatient clinics from two metropolitan pediatric hospitals; participants enrolled from each of the study sites did not significantly differ from one another on demographic characteristics (i.e., child age and gender, parent age, gender, and race, family SES, and marital status). Study procedures were approved by both hospitals' institutional review boards. A letter initially informed families about the study prior to a follow-up telephone call that identified those interested in participating in the study. An evaluation was scheduled with consenting families, usually on the day of the child's medical appointment. As this was part of an ongoing longitudinal study, approximately 20% of families declined participation, primarily citing time demands or lack of interest. After parental informed consent and child assent were obtained, parents and children completed self-report questionnaires with the assistance of trained research personnel. Families were provided with \$25 to acknowledge their time and participation.

Independent Variables

Demographic Characteristics and Medical History

Parent, child, and family characteristics collected through a questionnaire included the parent's and child's age, gender, race or ethnicity, family SES, and parent marital status. Parents also reported the type of insulin regimen (e.g., number of injections prescribed or insulin pump therapy), as well as frequency of daily blood glucose checks. The child's diagnosis was confirmed via medical record review; the hemoglobin A1C closest to date of study participation (within the previous 6 months) and illness duration were obtained via medical record review.

Diabetes Self-Efficacy

The Self-Efficacy for Diabetes Scale (SED; Grossman, Brinks, & Hauser, 1987) was adapted for use with parents to measure parents' perceived ability to manage their child's diabetes regimen. The original SED, developed for use with adolescents, has demonstrated good internal consistency, Cronbach's coefficient α = .88 (Grey, Davidson, Boland, & Tamborlane, 2001). In the adapted parent version, each of the 19 items inquire

about the parent's beliefs in his or her ability to perform specific behaviors required for the child's diabetes management (e.g., be the one in charge of giving insulin injections to my child) and is rated on a five-point scale ranging from 1 ("very sure I can't") to 5 ("very sure I can"). Higher scores indicate greater parental self-efficacy. Internal consistency was .87 in the present sample.

Responsibility for Diabetes Management

The Diabetes Family Responsibility Questionnaire (DFRQ; Anderson, Auslander, Jung, Miller, & Santiago, 1990) was used to measure the level of responsibility assumed by parents in managing their child's diabetes regimen. The DFRQ consists of 19 items that query the parent about his or her role in specific diabetes management tasks (e.g., remembering day of clinic appointment and noticing the early signs of hypoglycemia). Parents rate their responsibility or involvement on a three-point ordinal scale ranging from 1 (parent takes or initiates responsibility for this almost all of the time) to 3 (child takes or initiates responsibility for this almost all of the time); lower scores reflect more parent responsibility in diabetes management. Concurrent and construct validity have been demonstrated with a validated measure of family environment; internal consistency for the present sample was .82, which is comparable with that reported in the original sample (Anderson et al., 1990).

Fear of Hypoglycemia

The Hypoglycemia Fear Survey (HFS; Cox, Irvine, Gonder-Frederick, Nowacheck, & Butterfield, 1987) was used to measure parental anxiety and concerns about a child with diabetes experiencing symptoms of hypoglycemia. The Worry subscale consists of 13 items and was used in this study to assess parental worry about hypoglycemic symptoms (e.g., "I worry about my child blacking out"). It was rated by parents using a five-point Likert-type scale: 0 (none) to 4 (always). The HFS has been associated with parental worry about diabetes and the frequency of a child's hypoglycemic or hyperglycemic episodes (Marrero et al., 1997). Prior reports on the internal consistency of the HFS were .89 for the Worry subscale (Marrero et al., 1997). The internal consistency in the current study was .90.

Dependent Variable

Pediatric Parenting Stress

The Pediatric Inventory for Parents (PIP; Streisand et al., 2001) was utilized as the primary dependent measure of pediatric parenting stress. This rationally derived measure was designed to assess parental stress related to caring for a child with a chronic illness. The PIP has 42

items that ask parents to describe the frequency and intensity with which they experience stress related to caring for their child's illness across four domains: (a) communication (e.g., with child, partner, or health care team), (b) emotional functioning (e.g., impact of illness on sleeping and mood), (c) child's medical care (e.g., carrying out medical regimen), and (d) role functioning (e.g., impact of illness on parent's ability to work and care for other children). Parents were asked, for example, to indicate on a scale from 1 (never) to 5 (very often) how often an event had occurred in the past 7 days (e.g., "waiting for my child's test results"). Next, parents were asked to indicate how difficult the event was by rating it from 1 (not at all difficult) to 5 (extremely difficult). Based on parental responses, two overall total scores were calculated to reflect the *frequency* of stressful events (PIP-F), and the amount of *difficulty* experienced by parents in handling these events (PIP-D): higher scores indicate greater frequency and difficulty and increased pediatric parenting stress. Only PIP-F and PIP-D total scores were used in this study. PIP total scores have been significantly correlated with a general, non-illness specific measure of parenting stress, the Parenting Stress Index Short-Form (Abidin, 1990), state anxiety as measured by the State-Trait Anxiety Inventory (Spielberger, 1983) (Streisand et al., 2001), and family functioning (Streisand, Kazak, & Tercyak, 2003) within a childhood oncology population. It has also been shown to be predictive of child-health outcome among children with sickle cell disease (Logan, Radcliffe, & Smith-Whitley, 2002). The internal consistencies for the total scores in the current sample were PIP-F = .94 and PIP-D = .95.

Data Analysis Plan

Descriptive statistics were generated to determine the frequency and range of all study variables; less than 1% of the behavioral data were sporadically missing because of nonresponse. In cases where data were missing, mean values were imputed. Pearson product-moment and point-biserial correlations were then used to determine bivariate relationships of parent, child, and family demographics (age, gender, race, SES, and marital status), children's disease characteristics (metabolic control, insulin pump use, and illness duration), and parent psychological and behavioral measures with pediatric parenting stress. Hierarchical regression analyses were then utilized to evaluate study hypotheses and specifically to determine the degree of association of parent self-efficacy (SED), parental involvement in children's diabetes management (DFRQ), and fear of hypoglycemia

(HFS) with pediatric parenting stress (PIP-F and PIP-D). Demographic and illness characteristics significantly associated with PIP-F and PIP-D ($p \leq .05$) were identified as likely covariates and entered into the regression equations prior to the parent psychological and behavioral variables.

Results

Bivariate Analyses

The relationships between each independent variable with the dependent variables are presented in Table I. With respect to demographic and disease characteristics, results suggest that parents of younger children, non-Caucasian parents, those from lower SES families from single parent families, and those with children not on the insulin pump reported more frequent pediatric parenting stress. With regard to the psychological and behavioral variables, parents with lower self-efficacy for the diabetes regimen, greater responsibility for the diabetes regimen, and greater fears of hypoglycemia reported more frequent pediatric parenting stress. Parents of younger children, those using injections versus the pump, and parents with greater responsibility for the diabetes regimen and greater fears of hypoglycemia also reported more difficulty with pediatric parenting stress.

Table I. Bivariate Analysis of Demographic, Disease Characteristic, and Parent Psychological and Behavioral Functioning Variables with Pediatric Parenting Stress

| | <i>M</i> | <i>SD</i> | % | <i>r</i> _{PIP-F} | <i>r</i> _{PIP-D} |
|-----------------------------|----------|-----------|----|---------------------------|---------------------------|
| Child age (years) | 12.98 | 2.03 | | .19* | -.19* |
| Child gender (female) | | | 48 | .00 | -.04 |
| Parent age (years) | 42.27 | 6.29 | | .01 | -.11 |
| Parent gender (female) | | | 86 | -.02 | .13 |
| Parent race (Caucasian) | | | 79 | .26* | .12 |
| Family socioeconomic status | 45.54 | 11.94 | | -.21* | -.13 |
| Marital status (married) | | | 84 | -.18* | -.08 |
| A1C | 8.45 | 1.59 | | .16** | .12 |
| Pump status (on) | | | 20 | -.26* | -.19* |
| Illness duration | 4.90 | 3.20 | | -.05 | -.03 |
| SED | 78.86 | 9.90 | | -.24* | -.12 |
| DFRQ | 31.67 | 4.90 | | -.36* | -.34* |
| HFS | 19.46 | 9.07 | | .48* | .42* |
| PIP-F | 89.32 | 26.04 | | | .78* |
| PIP-D | 78.11 | 26.08 | | | |

For child and parent gender: 1, male; 2, female. For parent race: 1, Caucasian; 2, non-Caucasian. Socioeconomic status is based on Hollingshead (1975). For marital status: single or not married, 0; married or living as married, 1. For pump status: 0, not on pump; 1, on pump. Illness duration measured as time elapsed since diagnosis in years. SED, Self-Efficacy for Diabetes; DFRQ, Diabetes Family Responsibility Questionnaire; HFS, Hypoglycemic Fear Survey; PIP-F, Pediatric Inventory for Parents-Frequency; PIP-D, Pediatric Inventory for Parents-Difficulty.

* $p \leq .05$, ** $p = .05$.

Multivariate Analyses

Separate hierarchical multiple regression models were generated for the frequency and difficulty of pediatric parenting stress. Both models were conducted in steps, controlling for lower-order demographic variables on Step 1, metabolic control and insulin pump use status on Step 2, and higher-order parent psychological and behavioral variables on Step 3. Only independent variables with significant ($p \leq .05$) associations with one or both of the dependent variables of interest were tested. The results are presented in Table II.

For stress frequency, the step controlling for demographic variables was significant, Step 1 adjusted $R^2 = 0.10$, $F(4, 129) = 4.60$, $p = .002$. However, the change in step when metabolic control and insulin pump use variables were added to the model was not, Step 2 adjusted $R^2 = 0.11$, $F(2, 127) = 1.58$, $p = .21$. After controlling for these effects, parent psychological and behavioral functioning remained significantly associated with pediatric parenting stress, with the full adjusted model associated

Table II. Multivariate Models of Pediatric Parenting Stress ($N = 134$)

| Step | Variable entered | β | Partial correlation | ΔR^2 |
|-------------------|----------------------|---------|---------------------|--------------|
| Stress frequency | | | | |
| 1 | Child age | -.18 | -.18 | 0.13* |
| | Parent race | .19 | .19 | |
| | Socioeconomic status | -.09 | -.09 | |
| | Marital status | -.13 | -.13 | |
| 2 | A1C | .06 | .06 | 0.02 |
| | Pump | -.14 | -.14 | |
| 3 | Self-efficacy | -.19 | -.22* | 0.22* |
| | Responsibility | -.26 | -.24* | |
| | Hypoglycemia fear | .37 | -.40* | |
| Stress difficulty | | | | |
| 1 | Child age | -.18 | -.18 | 0.06 |
| | Parent race | .08 | .07 | |
| | Socioeconomic status | -.06 | -.06 | |
| | Marital status | -.06 | .06 | |
| 2 | A1C | .07 | .07 | 0.01 |
| | Pump | -.10 | -.09 | |
| 3 | Self-efficacy | -.10 | -.11 | 0.18* |
| | Responsibility | -.26 | -.23* | |
| | Hypoglycemia fear | .35 | .35* | |

* $p < .05$.

with approximately 32% of stress variance, $F(3, 124) = 14.11$, $p = .001$. All three independent variables were significantly associated with the outcome. Specifically, parents with lower self-efficacy, greater responsibility for the child's diabetes management, and greater fear of hypoglycemia experienced more frequent stress related to parenting their children with diabetes.

For stress difficulty, neither the step controlling for demographic variables, Step 1 adjusted $R^2 = 0.03$, $F(4, 129) = 1.93$, $p = .11$, nor the step controlling for metabolic control and insulin pump use variables, Step 2 adjusted $R^2 = 0.03$, $F(2, 127) = 0.92$, $p = .40$, were significant. After controlling for these effects, parent psychological and behavioral functioning again remained significantly associated with pediatric parenting stress, with the full adjusted model associated with 19% of stress variance, $F(3, 124) = 9.70$, $p = .001$. Responsibility and fear of hypoglycemia were significantly associated with stress difficulty. Specifically, parents with greater responsibility for the child's diabetes management and greater fear of hypoglycemia experienced more stress difficulty related to parenting their children with diabetes.

Discussion

The results of this study suggest that pediatric parenting stress experienced by parents of children with type 1 diabetes is multifaceted, and that it is likely related to different aspects of a child's diabetes regimen.

Specifically, up to nearly one-third of pediatric parenting stress appears to be associated with parents' beliefs about their ability to execute aspects of the diabetes regimen, their amount of responsibility for diabetes management, and their fears related to hypoglycemia. These findings highlight the need to examine both the frequency and difficulty of parent stress as it occurs among those who have children with diabetes. The results also indicate areas that require assessment when working with these families and perhaps point to promising areas of intervention.

Consistent with the concept of pediatric parenting stress (Streisand & Tercyak, 2004; Streisand et al., 2001), this study is among the first to use an illness-related measure to describe the extent to which parents of children with diabetes encounter illness-related stressful events and situations on a frequent basis and the extent to which these disease-specific occurrences can be difficult to handle. Frequency and difficulty of stress was assessed using the PIP—a recently developed measure of pediatric parenting stress (Streisand et al., 2001) that specifically examined stress as a function of

communicating with others about the child's diabetes, performing routine medical care for the diabetes regimen, continuing to function in the role of spouse, parent, and employee, and the impact of the illness on the parent's own emotional well-being.

At the bivariate level, several demographic characteristics, and insulin regimen were significantly related to pediatric parenting stress. Specifically, parents of younger children, of non-Caucasian race, who reported lower SES, and of single parent status experienced more frequent stress. These findings are consistent with prior reports that indicate more general difficulty (i.e., clinic follow-up, metabolic control, and diabetes worry) in parents of younger children (Marrero et al., 1997; Sullivan-Bolyai, Deatrick, Gruppuso, Tamborlane, & Grey, 2002), as well as in children from non-Caucasian families, families with fewer resources, and single-parent families (Auslander, Thompson, Dreitzer, White, & Santiago, 1997; Guttman-Bauman, Flaherty, Strugger, & McEvoy, 1998; Overstreet et al., 1995). Additionally, hemoglobin A1C was only marginally associated with the frequency of pediatric parenting stress, and whether the child was on insulin pump therapy was related to both stress frequency and difficulty. Specifically, parents with children on conventional insulin injection therapy had more frequent parenting stress. Given the lack of a more clearly significant relationship between A1C and parent stress, the results suggest that it is not simply that parents of children in better metabolic control have less parenting stress. Rather, there appears to be aspects of the diabetes regimen itself that affect parenting stress, regardless of the child's metabolic control. Future prospective research should explore the relationship between metabolic control, diabetes therapy regimen, and pediatric parenting stress and its components (i.e., communication, emotional functioning, child's medical care, and role functioning).

After controlling for important and salient demographic and illness related variables, parent psychological variables remained significantly associated with both stress frequency and difficulty in multiple variable models. Specifically, lower self-efficacy, greater responsibility for diabetes management, and greater fear of hypoglycemia were associated with more frequent and difficult pediatric parenting stress. These results are consistent with other findings indicating that there are numerous factors to consider in assessing stress among parents of children with diabetes (Kwok & Wong, 2000). This study is unique in that it specifically examined parent stress related to the child's illness and identified three parent psychological and behavioral

functioning variables that appear to be particularly relevant when assessing stress among these parents.

Although all of the study's findings were generally in the expected direction, the finding that greater parental responsibility for diabetes management was positively related to stress—both frequency and difficulty—is somewhat disconcerting because parents are routinely asked or required to remain highly involved in their child's diabetes management. This remains true even as children mature because consistent parental involvement in diabetes management often results in better metabolic control over time (Anderson et al., 1997; Anderson, Brackett, Ho, & Laffel, 1999). Thus, there is little or no natural break in this requirement of parents in managing their children's illness, which could maintain increased stress levels over time and illness duration. It is possible that some parents who are stressed become more involved in the child's diabetes management as an attempt to manage their own emotions about diabetes (i.e., problem-focused coping), whereas others may feel overwhelmed as a result of how much they do to manage their child's diabetes on a daily basis. Of course, these possibilities would be best explored in a longitudinal fashion by examining the nature and direction of the relationship between parental management of their child's diabetes and pediatric parenting stress and how this relationship might change over time.

The findings of lower self-efficacy and greater fear of hypoglycemia being positively associated with parenting stress are less surprising. Children are dependent on their parents for help with managing diabetes, and it is undoubtedly stressful if parents do not feel adequately prepared to handle all aspects of diabetes management. Future studies will allow further examination of which aspects of diabetes management are most challenging for parents and may help guide the development of interventions to increase parental self-efficacy. Similarly, parental fear of children's hypoglycemia likely impacts diabetes management, and future research should include examination of the relationships among parent and child fear of hypoglycemia and actual diabetes regimen, or self-care, behavior.

Despite the noted findings, no conclusions about causality can be drawn given the cross-sectional nature of this work. Specifically, whether pediatric parenting stress is a cause or consequence of parent psychological and behavioral functioning in other areas. Additionally, questionnaires were administered to parents of a relatively wide age range of children, and it is likely that stressors experienced by parents of younger children differed from those experienced by parents of older children, such

as those who had reached adolescence. Furthermore, the study relied upon self-report, and data were not validated by other methods. This is particularly salient for pediatric parenting stress, as other forms of validity (e.g., convergent validity) have not been reported. Further, this study did not use PIP domain scores and rather relied on total scale scores. Given the design of the study, some observed relationships may also have been influenced by shared method variance. Finally, the majority of our sample was comprised of mothers, and it is likely that fathers also experience considerable pediatric parenting stress, although that stress may differ in quality and quantity. Further study of the antecedents, correlates, and consequences of pediatric parenting stress should be examined, along with parent coping style.

In conclusion, though stress in parents of children with diabetes has been studied previously, this study is the first to specifically measure stress as it relates to aspects of their child's illness. Results suggest the importance of considering demographic and child disease characteristics in assessing parental stress. Furthermore, findings indicate that difficulties in parents' level of confidence in their ability to manage their child's diabetes, sharing much of the responsibility for their child's diabetes management, and high worry and concern about their child experiencing a severe low blood glucose level likely go hand in hand with increased frequency and difficulty of pediatric parenting stress. Each of these areas of psychological and behavioral functioning is amenable to assessment via both clinical interview and self-report measures such as the ones used here, and all are potential areas of intervention. For example, although parents may be informed of the need for them to remain involved in the child's diabetes management, this may prove to be highly taxing if accompanied by low self-confidence in their abilities, great concern about their child experiencing hypoglycemia, or increased stress. In this case, parents may benefit from additional diabetes education and counseling, stress management training, and problem-solving training to bolster their self-confidence and to better prepare them to manage hypoglycemic episodes. Doing so could help to alleviate pediatric parenting stress and improve parent mental health and, ultimately, child-health outcomes.

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