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Authoritative Parenting, Parenting Stress, and Self-Care in Pre-Adolescents with Type 1 Diabetes

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Abstract

Parent involvement in type 1 diabetes (T1DM) care leads to improved adherence; however, the manner in which parents approach illness management interactions with children must also be considered. It was hypothesized that greater use of an authoritative parenting style and less parenting stress would be associated with greater behavioral adherence and better metabolic control. Ninety-five primary caregivers of preadolescents (ages 8-11) with T1DM completed questionnaires assessing parenting style, pediatric parenting stress, and child behavioral adherence. Caregivers primarily self-identified as using an authoritative parenting style. Greater authoritative parenting was associated with greater behavioral adherence and less difficulty with pediatric parenting stress; no differences in metabolic control were observed. Greater engagement in authoritative parenting behaviors may contribute to increased age-appropriate child behavioral adherence and less pediatric parenting stress. Interventions highlighting diabetes-specific authoritative parenting techniques may enhance health outcomes and improve overall family functioning.

Keywords

parenting style; preadolescence; type 1 diabetes; adherence

INTRODUCTION

Family-centered care is an integrative model of illness management that recognizes the vital role families play in the management of children's health. The primary tenets of family-centered care emphasize parent and health care provider collaboration to promote developmentally-appropriate child involvement in daily self-care and highlight family strengths and styles of interaction (American Academy of Pediatrics, 2003). For children with chronic illnesses such as type 1 diabetes (T1DM), knowledge of parent-child interactions related to disease management is a key component of family-centered care, as complex daily medical tasks are performed by parents and children and, more importantly,

occur outside of the typical clinic visit (Anderson, Ho, Brackett, Finkelstein, & Laffel, 1997; Solowiejczyk, 2004). Increased parental involvement in diabetes care is consistently associated with improved metabolic control and adherence (Anderson et al., 2002), particularly for children who are not as capable in T1DM self-management (Palmer et al., 2009). However, increased diabetes-related conflict, a potential byproduct of parent involvement, has also been related to poorer metabolic control (Anderson et al., 2002). Thus, in the model of family-centered care, it is insufficient to conclude that greater parent involvement alone is necessary for optimal diabetes control – the manner in which parents approach disease management must also be considered.

Parenting style is a well-researched conceptual categorization of parents' interactions with their children. Using behavioral continuums representing parental responsiveness (warmth, supportiveness) and demandingness (behavioral control), three main styles of parenting behaviors have been identified. Authoritative parenting includes consistent but flexible limits along with high levels of warmth and nurturance. Authoritarian parents exert a high degree of control and value clear, structured environments and obedience to rules; permissive parents are responsive to children's emotional needs but are not particularly structured or demanding (Baumrind, 1971). Greater use of authoritative parenting style has been most consistently related to positive child health outcomes (Darling & Steinberg, 1993), including healthy feeding practices and diet (Hubbs-Tait, Kennedy, Page, Topham, & Harrist, 2008; Kremers, Brug, de Vries, & Engels, 2003) and reduced risk of obesity (Rhee, Lumeng, Appugliese, Kaciroti, & Bradley, 2006; Wake, Nicholson, Hardy, & Smith, 2007), and may play a crucial role in daily T1DM management (Harris, Mertlich, & Rothweiler, 2001). Authoritative mothering and fathering has been positively associated with better glycemic control and self-care behaviors in adolescents (Greene, Mandelco, Roper, Marshall, & Dyches, 2010; Shorer et al., 2011), and parental warmth has been positively associated with behavioral adherence in children ages 4-10 (Davis et al., 2001). The inverse has also been found with more parental restrictiveness predicting poorer metabolic control (Davis et al., 2001). However, not all research has found a significant correlation between parenting style, metabolic control, and adherence (Butler, Skinner, Gelfand, Berg, & Wiebe, 2007; Sherifali, Ciliska, & O'Mara, 2009).

Although greater use of authoritative parenting is associated with improved illness management in some populations, studies to date have failed to incorporate a targeted developmental perspective on preadolescents. Warm, structured parent-child interactions during preadolescence may serve as a protective factor for prevention of the deterioration in metabolic control (Anderson et al., 1997; Helgeson et al., 2010) and increased family conflict (Anderson et al., 2002) often evidenced during adolescence. Identification of efficacious parenting practices for preadolescents with T1DM may set the stage for continued, developmentally-appropriate parental monitoring of care that can be carried on throughout adolescence.

In addition to parenting style, pediatric parenting stress, or reactions to stressors related to parenting a child with a chronic illness, should also be considered simultaneously to provide a more comprehensive overview of parent functioning in family-centered care. Pediatric parenting stress represents interrelationships among child health, parental responsibility and burden, and psychological and behavioral responses to illness (Streisand, Braniecki, Tercyak, & Kazak, 2001). Parents of children with T1DM report increased pediatric parenting stress, and greater difficulty with parenting stress is associated with lower self-efficacy for diabetes-related tasks and worse family functioning (Streisand, Kazak, & Tercyak, 2003; Streisand, Swift, Wickmark, Chen, & Holmes, 2005). Additionally, greater parent responsibility for diabetes care predicts increased pediatric parenting stress (Streisand et al., 2005), suggesting that suboptimal parenting around chronic illness management may

lead to greater parenting stress and potentially ineffective parent involvement in T1DM care. As parenting styles are relatively stable over time (Darling & Steinberg, 1993), parenting stress may be a more immediate factor influencing the parent-child system of daily disease care and should be explored as an independent predictor when evaluating family interactions and health outcomes (Streisand & Tercyak, 2004).

The goal of the current study is to explore parenting style and pediatric parenting stress during preadolescence, a critical developmental stage during which parents and children typically start to negotiate responsibility for sharing diabetes care tasks (Anderson, Auslander, Jung, Miller, & Santiago, 1990). Increased use of authoritative parenting practices was hypothesized to be associated with greater behavioral adherence and improved metabolic control in preadolescents; it was also hypothesized that lower pediatric parenting stress would be related to improved adherence and metabolic control. Additionally, the association between parenting style, which is a stable pattern of interactions, and pediatric parenting stress, a contextual variable representing parent functioning at a specific point in time, was explored. It was hypothesized that increased use of authoritative parenting practices would be related to lower pediatric parenting stress.

METHODS

Participants

Primary caregivers were recruited to participate in a descriptive study of parenting and T1DM from a pediatric endocrinology clinic in a large urban children's hospital in the Mid-Atlantic. This cross-sectional study was approved by the institutional review board. Total time to complete all study measures was estimated at 20-30 minutes, and all participants received a small gift card upon completion of study measures. Inclusion criteria for participation included: 1) identification as primary caregiver of an 8 – 11 year old with T1DM; 2) T1DM illness duration of at least 6 months; 3) no other chronic medical conditions; and 4) sufficient mastery of English to complete study questionnaires. Two hundred and thirty-seven potentially eligible families were contacted by informational letter and 185 were reached by phone (78%). Of the 185 families reached, 158 families (85%) were eligible and expressed interest in participating (8% ineligible; 7% not interested). Written consent and data were obtained for 105 primary caregivers (66%; 97 mothers, 7 fathers, 1 grandmother), with participants completing questionnaires by mail (89%), at clinic (10%), or by phone (1%). For the purposes of this study, primary caregivers are referred to as "parents."

Measures

Parenting Styles and Dimensions Questionnaire (PSDQ; Robinson, Mandleco, Olsen, & Hart, 2001)—The PSDQ is a 32-item, parent-report questionnaire based on Baumrind's conceptualization of Authoritative, Authoritarian, and Permissive parenting styles. Each item is rated along a 5-point Likert-type scale (1 = Never, 5 = Always), with higher scores indicating more frequent use of the described behavior. Internal consistency reliabilities for the 3 scales are good to excellent (Robinson, Mandleco, Olsen, & Hart, 1995). Internal consistency for the current sample is also good: Authoritative $\alpha = .84$; Authoritarian $\alpha = .70$; Permissive $\alpha = .74$.

Pediatric Inventory for Parents (PIP; Streisand et al., 2001)—The PIP is a 42-item, parent-report questionnaire designed to measure the frequency of stressful events (PIP-F) and amount of difficulty experienced by parents in handling these events (PIP-D). Each item is rated on a 5-point Likert scale (1 = Not at all, 5 = Extremely), with higher scores indicating increased frequency and/or difficulty. For the purposes of this study, scores from

the 42 items of the PIP-D were examined. The internal consistency and validity of the PIP have been found to be acceptable when used with parents of children with type 1 diabetes (Streisand et al., 2005). Internal consistency for PIP-D for the current sample was .96.

Self-Care Inventory (SCI; La Greca, 2004)—The SCI is a 14-item questionnaire that asks parents to report how often children have followed their “prescribed regimen” for specific diabetes self-care behaviors over the past one to two weeks. Frequency of child completion of each behavior is rated on a 5 point Likert scale (1 = “never do it,” 5 = “always do this as recommended without fail,”) with higher scores indicating more consistent completion of the behavior. The SCI has been used with parents of pre-adolescents with T1DM and has acceptable reliability and validity (Lewin et al., 2009). Internal consistency for this sample was .79.

General and Medical Information Questionnaire—This 40-item questionnaire developed by the research team was used to obtain demographic and medical information. Information about child illness characteristics, including current insulin regimen and illness duration, was reported and verified through medical record review. Metabolic control was obtained from medical records and is represented by the average of the participant’s three most recent hemoglobin A1c levels (A1c) obtained at least 6 months after diagnosis (as available; Rohlfing et al., 2002).

Statistical Analyses

Descriptive statistics were generated to determine the frequency and range of all study variables. Pearson correlations were conducted to assess the relationships among demographic characteristics of the sample and parenting style, difficulty with pediatric parenting stress, behavioral adherence (as measured by the SCI), and A1c. Given the sample size, ethnicity was transformed to a dichotomous variable representing Caucasian and non-Caucasian and marital status was transformed to a dichotomous variable representing married and other. As recommended by the PSDQ scoring (Robinson et al., 2001), a primary style of parenting was assigned to each parent based on their responses across the three parenting dimensions. Analyses of covariance (ANCOVAs) were conducted to determine the relationships among parenting style and diabetes control (children’s behavioral adherence and metabolic control) and pediatric parenting stress and diabetes control. Finally, an ANCOVA was conducted to evaluate the relationship between parenting style and pediatric parenting stress.

An a priori power analysis indicated that a sample size of $n = 84$ was required for the proposed analyses based on achieving a power of 80%, with a 2-tailed type I error rate of $\alpha = 0.05$, and assuming that measures of the independent variables (parenting style, pediatric parenting stress) and dependent variables (behavioral adherence, A1c) are independent.

RESULTS

Sample Characteristics

Ten participants out of the 105 participants (10%) who completed consent and questionnaires were dropped due to missing data. The ten families that were not included did not significantly differ from the larger sample in terms of key demographic variables (child age, gender, ethnicity, parent marital status, household income, regimen; $ps > .05$), but did have children who were diagnosed with T1DM for significantly less time ($M = 1.84$ yrs) than the final analysis sample ($M = 3.42$ yrs; $t(103) = 1.95$, $p = .05$).

The final sample totaled 95 primary caregivers (93% female; 87 mothers, 7 fathers, 1 grandmother) of preadolescents with type 1 diabetes. Children were between ages 8 – 11 (M age = 9.33 years, $SD = .87$), primarily Caucasian (64%), and diagnosed with type 1 diabetes for an average of 3.42 years ($SD = 2.53$ years). Approximately $\frac{1}{2}$ of children were prescribed a conventional insulin regimen (2 or 3 injections/day) and, on average, participants were in good metabolic control ($MA1c = 7.96\%$; $SD = 1.04$). Complete demographic data is presented in Table 1.

Parenting style

Using the PSDQ, subscale scores on the three parenting dimensions were calculated. Preliminary results indicated that 97% of parents ($n = 92$) endorsed behaviors indicative of a primarily authoritative parenting style. The remaining 3% of parents reported using a predominantly permissive style. Higher use of authoritative parenting practices was correlated with less reported use of authoritarian parenting practices ($r(95) = -.22$; $p < .05$). Given the uniformity of responses, remaining analyses utilized scaled scores on the authoritative subscale. Authoritative scores for the multivariate analyses were dichotomized by dividing the sample by the mean of the sample's distribution to represent low use and high use of authoritative parenting behaviors (Authoritative mean score = 60.39; range = 46 - 75). To keep analyses similar across the two constructs, pediatric parenting stress scores were dichotomized by dividing the sample by the mean of the sample's distribution (PIP-D mean score = 92.55; range = 51 - 173).

Associations with Demographic Characteristics

Authoritative parenting practices were not significantly correlated with any of the demographic variables (child age, gender, ethnicity, parent marital status, household income, regimen). Parents who were not married reported increased difficulty with pediatric parenting stress. Lower household income, non-Caucasian ethnicity, and conventional insulin regimen were associated with decreased child behavioral adherence. Identification as non-Caucasian and lower household income were associated with higher A1c levels. Demographic variables that were significantly correlated with the outcomes of interest were used as covariates in the multivariate analyses conducted. Table 2 presents the correlation results.

Authoritative Parenting, Behavioral Adherence, and Metabolic Control

Analyses of covariance were conducted to determine the relationship among parent-reported authoritative behaviors (low authoritative vs. high authoritative), children's behavioral adherence, and metabolic control. Ethnicity, income, and regimen were used as covariates. Table 3 presents the mean values for the SCI and A1c levels for each group. Parents with greater use of authoritative parenting behaviors reported that their children engaged in more self-care behaviors than parents with less use of authoritative parenting ($F(4, 88) = 7.59$, $p < .01$, $partial \eta^2 = .08$). No differences in A1c were observed ($F(4, 88) = .35$, $p = .55$) between those with greater and lower authoritative parenting behaviors.

Pediatric Parenting Stress, Behavioral Adherence, and Metabolic Control

Analyses of covariance were conducted to determine the relationship among pediatric parenting stress, children's behavioral adherence, and metabolic control. Controlling for ethnicity, income, and regimen, there were no observed differences between low and high levels of difficulty with pediatric parenting stress on the outcomes of child behavioral adherence ($F(4, 88) = .64$, $p = .43$) or A1c ($F(4, 88) = .02$, $p = .88$).

Authoritative Parenting and Pediatric Parenting Stress

An additional ANCOVA was performed to assess the relationship between authoritative parenting and pediatric parenting stress. Controlling for marital status, ANCOVA results demonstrated that parents who reported greater use of authoritative parenting behaviors reported significantly less difficulty with pediatric parenting stress (adj PIP-D $M = 85.20$) than parents with less use of authoritative parenting (adj PIP-D $M = 103.03$; $F(2,92) = 8.65$; $p < .01$; *partial* $\eta^2 = .06$).

DISCUSSION

This study adds to the growing evidence that authoritative parenting practices are positively associated with healthy family functioning and adherence in a population of children with chronic illness and, importantly, extends prior work examining parenting style in younger children and adolescents with T1DM (Butler et al., 2007; Davis et al., 2001; Greene et al., 2010; Shorer et al., 2011) to the less closely examined developmental period of preadolescence. In this sample, greater parent-reported authoritative parenting behavior was associated with increased age-appropriate child behavioral adherence. Pediatric parenting stress was not significantly associated with metabolic control or behavioral adherence; however, greater use of an authoritative parenting style was associated with less difficulty with pediatric parenting stress.

Results support a weak but significant association between authoritative parenting style and increased child behavioral adherence, reinforcing the importance of parental involvement in developmentally-appropriate chronic illness management. This study supports prior research connecting greater parental warmth and authoritative parenting to improved adherence (Davis et al., 2001; Greene et al., 2010). It also adds to the literature by defining the relationship between the stable trait of parenting style and the more immediate experience of pediatric parenting stress. As more difficulties with pediatric parenting stress have been linked with lower self-efficacy in other samples (Streisand et al., 2005), our results demonstrating a small association between greater authoritative parenting and decreased difficulties with stress may provide an important avenue for intervention for parents of children with chronic illness. More information about the mechanism of this relationship is important to include in future studies. For example, greater parental warmth and flexibility may decrease pediatric parenting stress through a reduction in family conflict related to diabetes management.

Although similar results were not observed in this sample of preadolescents, previous research with older children has found a correlation between authoritative parenting and improved metabolic control (Greene et al., 2010). It may be that our sample of preadolescents had less variability in metabolic control, given that the mean A1c was within the recommended range for this age group ($A1c < 8.0\%$; American Diabetes Association, 2010). However, metabolic control was related to demographic characteristics such that parents of non-Caucasian children and lower-income families had children in relatively worse metabolic control. These findings are concordant with several other studies suggesting that Black children are consistently in poorer metabolic control than their White, non-Hispanic, counterparts (Delamater et al., 1999) and that children from lower income families are more likely to be in poorer metabolic control than their higher income peers (Hassan, Loar, Anderson, & Heptulla, 2006).

The present study has several limitations, including a cross-sectional sample of predominantly married, middle-class mothers. Future research should explore parenting style, pediatric parenting stress, and diabetes control in a larger, more diverse sample of families. Additionally, as most of the parents reported using an authoritative parenting style,

behaviors associated with authoritarian and permissive parenting were not explored. However, similar studies support that parents most often self-report using an authoritative parenting style (Greene et al., 2010; Hubbs-Tait et al., 2008). Use of different assessment tools or examining parenting style from the child's perspective may also reveal additional relationships between parenting style and health outcomes, as children may perceive different parenting behaviors than parents (Kremers et al., 2003), and discordant responses between parents and children may be clinically relevant (Butner et al., 2009). Additionally, use of child-report may limit potential social desirability biases in parents reporting on their own parenting style (Sherifali et al., 2009). Incorporation of a dimensional approach that captures continuous representations of behaviors contributing to parenting style, such as structure, control, and acceptance, may also elucidate the most salient behaviors that contribute to decreased pediatric parenting stress and, possibly, improved adherence (Butler et al., 2007). A larger study can also differentiate the specific influences of maternal and paternal parenting style, as research suggests that parenting interactions with mothers and fathers may differentially affect diabetes control and increased paternal involvement may be particularly effective in improving diabetes control (Shorer et al., 2011). As many preadolescents in this sample were in adequate to optimal metabolic control, adherence was likely more optimal as compared to a typical clinic sample, as indicated by significant yet small differences in SCI scores between the two groups. Future research should further explore specific parenting behaviors as a predictor of metabolic control in preadolescents, particularly using a longitudinal design to determine if authoritative parenting in preadolescents buffers the decline in behavioral adherence and A1c frequently seen across adolescence (Helgeson et al., 2010).

This study adds to the growing evidence that authoritative parenting practices promote healthy family functioning in a population of children with chronic illness. Developmentally-appropriate psychoeducation and support are key components of family-centered care (Bruce et al., 2002; Schor, 2003) and providing targeted parenting resources and information to parents of preadolescents may enhance behavioral adherence and decrease pediatric parenting stress. Future studies should explore the best ways to deliver parenting skills and education in a medical setting, as barriers to providing parenting advice in the context of medical care have been noted (Dumont-Mathieu, Bernstein, Dworkin, & Pachter, 2006). Linking parenting advice to anticipatory guidance, such as advice given to parents of preadolescents prior to the deterioration of metabolic control seen during adolescents, may be a helpful way for clinicians to introduce parenting strategies in a clinic setting. Parenting interventions that provide tools for implementation of authoritative parenting techniques in illness management may improve overall family functioning and disease care, and should be incorporated in clinical settings.

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REFERENCES

- American Academy of Pediatrics. Family-centered care and the pediatrician's role. *Pediatrics*. 2003; 112:691–697. [PubMed: 12949306]
- American Diabetes Association. Standards of medical care in diabetes--2010. *Diabetes Care*. 2010; 33(Suppl 1):S11–61. [PubMed: 20042772]
- Anderson BJ, Auslander WF, Jung KC, Miller JP, Santiago JV. Assessing family sharing of diabetes responsibilities. *Journal of Pediatric Psychology*. 1990; 15:477–492. [PubMed: 2258796]
- Anderson BJ, Ho J, Brackett J, Finkelstein D, Laffel L. Parental involvement in diabetes management tasks: Relationships to blood glucose monitoring adherence and metabolic control in young

adolescents with insulin-dependent diabetes mellitus. *Journal of Pediatrics*. 1997; 130:257–265. [PubMed: 9042129]

- Anderson BJ, Vangsness L, Connell A, Butler D, Goebel-Fabbri A, Laffel LM. Family conflict, adherence, and glycaemic control in youth with short duration type 1 diabetes. *Diabetic Medicine*. 2002; 19:635–642. [PubMed: 12147143]
- Baumrind D. Current patterns of parental authority. *Developmental Psychology*. 1971; 4:1–103.
- Bruce B, Letourneau N, Ritchie J, Larocque S, Dennis C, Elliott M. A multisite study of health professionals' perceptions and practices of family-centered care. *Journal of Family Nursing*. 2002; 8:408–429.
- Butler JM, Skinner M, Gelfand D, Berg CA, Wiebe DJ. Maternal parenting style and adjustment in adolescents with type I diabetes. *Journal of Pediatric Psychology*. 2007; 32:1227–1237. [PubMed: 17717004]
- Butner J, Berg C, Osborn P, Butler JM, Godri C, Fortenberry KT, Barach I, Le H, Wiebe DJ. Parent-adolescent discrepancies in adolescents' competence and the balance of adolescent autonomy and adolescent and parent well-being in the context of type 1 diabetes. *Developmental Psychology*. 2009; 45:835–849. [PubMed: 19413435]
- Darling N, Steinberg L. Parenting style as context: an integrative model. *Psychological Bulletin*. 1993; 113:487–496.
- Davis CL, Delamater AM, Shaw KH, La Greca AM, Eidson MS, Perez-Rodriguez JE, Nemery R. Parenting styles, regimen adherence, and glycemic control in 4- to 10-year-old children with diabetes. *Journal of Pediatric Psychology*. 2001; 26:123–129. [PubMed: 11181888]
- Delamater AM, Shaw KH, Applegate EB, Pratt IA, Eidson M, Lancelotta GX, Gonzalez-Mendoza L, Richton S. Risk for metabolic control problems in minority youth with diabetes. *Diabetes Care*. 1999; 22:700–705. [PubMed: 10332669]
- Dumont-Mathieu TM, Bernstein BA, Dworkin PH, Pachter LM. Role of pediatric health care professionals in the provision of parenting advice: A qualitative study with mothers from 4 minority ethnocultural groups. *Pediatrics*. 2006; 118:e839–848. [PubMed: 16950970]
- Greene MS, Mandleco B, Roper SO, Marshall ES, Dyches T. Metabolic control, self-care behaviors, and parenting in adolescents with type 1 diabetes: A correlational study. *The Diabetes Educator*. 2010; 36:326–336. [PubMed: 20200283]
- Harris MA, Mertlich D, Rothweiler J. Parenting children with diabetes. *Diabetes Spectrum*. 2001; 14:182–184.
- Hassan K, Loar R, Anderson BJ, Heptulla RA. The role of socioeconomic status, depression, quality of life, and glycemic control in type 1 diabetes mellitus. *Journal of Pediatrics*. 2006; 149:526–531. [PubMed: 17011326]
- Helgeson VS, Snyder PR, Seltman H, Escobar O, Becker D, Siminerio L. Brief report: Trajectories of glycemic control over early to middle adolescence. *Journal of Pediatric Psychology*. 2010; 35:1161–1167. [PubMed: 20189951]
- Hubbs-Tait L, Kennedy TS, Page MC, Topham GL, Harrist AW. Parental feeding practices predict authoritative, authoritarian, and permissive parenting styles. *Journal of American Dietetic Association*. 2008; 108:1154–1161.
- Kremers SP, Brug J, de Vries H, Engels RC. Parenting style and adolescent fruit consumption. *Appetite*. 2003; 41:43–50. [PubMed: 12880620]
- La Greca, A. *Manual for the Self Care Inventory*. Author; Coral Gables, FL: 2004.
- Lewin AB, LaGreca AM, Geffken GR, Williams LB, Duke DC, Storch EA, Silverstein JH. Validity and reliability of an adolescent and parent rating scale of type 1 diabetes adherence behaviors: the Self-Care Inventory (SCI). *Journal of Pediatric Psychology*. 2009; 34:999–1007. [PubMed: 19423660]
- Palmer DL, Berg CA, Butler J, Fortenberry K, Murray M, Lindsay R, Donaldson D, Swinyard M, Foster C, Wiebe DJ. Mothers', fathers', and children's perceptions of parental diabetes responsibility in adolescence: Examining the roles of age, pubertal status, and efficacy. *Journal of Pediatric Psychology*. 2009; 34:195–204. [PubMed: 18632787]
- Rhee KE, Lumeng JC, Appugliese DP, Kaciroti N, Bradley RH. Parenting styles and overweight status in first grade. *Pediatrics*. 2006; 117:2047–2054. [PubMed: 16740847]

- Robinson C, Mandleco B, Olsen F, Hart C. Authoritative, authoritarian, and permissive parenting practices: development of a new measure. *Psychological Reports*. 1995; 77:819–830.
- Robinson, C.; Mandleco, B.; Olsen, F.; Hart, C. The parenting styles and dimensions questionnaire (PSDQ). In: Perlmutter, BF.; Touliatos, J.; Straus, MA., editors. *Handbook of Family Measures Techniques*. Vol. Vol 3. Sage Publications; Thousand Oaks, CA: 2001. p. 319-321.
- Rohlfing CL, Wiedmeyer HM, Little RR, England JD, Tennill A, Goldstein DE. Defining the relationship between plasma glucose and HbA1c: Analysis of glucose profiles and HbA1c in the Diabetes Control and Complications Trial. *Diabetes Care*. 2002; 25:275–278. [PubMed: 11815495]
- Schor EL. Family pediatrics: Report of the Task Force on the Family. *Pediatrics*. 2003; 111:1541–1571. [PubMed: 12777595]
- Sherifali D, Ciliska D, O'Mara L. Parenting children with diabetes: Exploring parenting styles on children living with type 1 diabetes mellitus. *The Diabetes Educator*. 2009; 35:476–483. [PubMed: 19297656]
- Shorer M, David R, Schoenberg-Taz M, Levavi-Lavi I, Phillip M, Meyerovitch J. Role of parenting style in achieving metabolic control in adolescents with type 1 diabetes. *Diabetes Care*. 2011; 34:1735–1737. [PubMed: 21788643]
- Solowiejczyk J. The family approach to diabetes management: Theory into practice toward the development of a new paradigm. *Diabetes Spectrum*. 2004; 17:31–36.
- Streisand R, Braniecki S, Tercyak KP, Kazak AE. Childhood illness-related parenting stress: The pediatric inventory for parents. *Journal of Pediatric Psychology*. 2001; 26:155–162. [PubMed: 11259517]
- Streisand R, Kazak A, Tercyak KP. Pediatric-specific parenting stress and family functioning in parents of children treated for cancer. *Children's Health Care*. 2003; 32:245–266.
- Streisand R, Swift E, Wickmark T, Chen R, Holmes CS. Pediatric parenting stress among parents of children with type 1 diabetes: The role of self-efficacy, responsibility, and fear. *Journal of Pediatric Psychology*. 2005; 30:513–521. [PubMed: 16055489]
- Streisand, R.; Tercyak, KP. Parenting chronically ill children: the scope and impact of pediatric parenting stress. In: Long, N.; Hoghughi, M., editors. *Sage Handbook of Parenting*. Sage Publications; London: 2004. p. 181-197.
- Wake M, Nicholson JM, Hardy P, Smith K. Preschooler obesity and parenting styles of mothers and fathers: Australian national population study. *Pediatrics*. 2007; 120:e1520–1527. [PubMed: 18055667]

Table 1*Demographic Characteristics of the Sample (n = 95)*

	%	Mean	SD	Range
Child Age (years)		9.33	.87	8.04 – 11.50
Child Gender (% female)	47%			
Child Ethnicity				
% Caucasian	64%			
% African American	21%			
% Latino	5%			
% Other	10%			
Parent Age (years)		40.61	5.93	26.80 – 56.81
Parent Gender (% female)	93%			
Parent Income (% > 50,000)	77%			
Parent Marital Status (% married)	83%			
Child Illness Duration (years)		3.42	2.53	.56 – 9.33
Child Medical Regimen				
% conventional, 2-3 injections/day	52%			
% multiple daily injections (basal/bolus)	30%			
% continuous subcutaneous insulin infusion	18%			
A1c (averaged over 3 clinic visits)		7.96%	1.04	5.50% - 10.47%

Table 2

Bivariate Analyses of Demographic and Medical Variables

	1	2	3	4	5	6	7	8	9	10
1. Authoritative	1	-.24*	.18	-.03	.02	.14	.11	.09	.01	-.01
2. PIP-D		1	-.18	.05	-.15	-.06	.06	-.24*	-.18	.06
3. SCH			1	-.28**	-.09	.16	.24*	.14	.20*	.22*
4. HbA1c				1	.15	-.09	-.44**	-.17	-.21*	.02
5. Child Age					1	.07	-.32**	-.31**	-.21*	.14
6. Parent Gender						1	.04	-.13	-.10	.03
7. Ethnicity							1	.32**	.22*	.18
8. Marital Status								1	.53**	.16
9. Income									1	.35**
10. Regimen										1

* $p < .05$;

** $p < .01$

parent gender 0 = male, 1 = female; ethnicity 0 = non-Caucasian, 1 = Caucasian; marital status 0 = not married, 1 = married; regimen 0 = conventional, 1 = intensive (multiple daily injections, pump)

Table 3

Child Behavioral Adherence and Metabolic Control as a Function of Authoritative Parenting Behavior

	Authoritative Parenting		<i>p value</i>	<i>Partial η^2</i>
	Low (<i>n</i> = 45)	High (<i>n</i> = 50)		
SCI, adjusted mean score (<i>SEM</i>)	39.52 (.72)	42.27 (.68)	<.01**	.08
A1c, adjusted mean score (<i>SEM</i>)	8.02 (.14)	7.90 (.13)	.55	.01

**
p < .01