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Responsive parenting is associated with improved type 1 diabetes-related quality of life

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Abstract

Background—Improved quality of life is an important treatment goal for children and adolescents with type 1 diabetes. While previous research supports a relationship between family environment and quality of life, little research has addressed the relationship of parenting style constructs to quality of life in children with chronic disease. The present investigation assesses the relationship of parent responsiveness and demandingness with diabetes-related quality of life among children and adolescents with type 1 diabetes.

Methods—Baseline and 12-month follow-up self-report assessments were collected on a sample of 81 children with type 1 diabetes participating in an efficacy trial of a behavioral intervention to enhance adherence. The sample had a mean age of 13.3 years ($SD = 1.7$) and duration of diabetes of 7.7 years ($SD = 3.7$). Multiple regression analyses were conducted to determine the relationship of parent responsiveness and demandingness to diabetes-related quality of life at each time point.

Results—After adjusting for demographic and diabetes characteristics, as well as diabetes-specific parent-child behaviors, parent responsiveness was significantly associated with baseline diabetes-related quality of life ($B=.23$; $p=.04$). This relationship was sustained at 12-month follow-up ($B=.22$; $p=.04$) after adjusting for baseline quality of life and treatment group assignment, suggesting that parent responsiveness is associated with improved quality of life.

Conclusions—Findings indicate the importance of a supportive and emotionally warm parenting style in promoting improved quality of life for children with type 1 diabetes. Appropriate parenting skills should be an element of diabetes family management health care.

Keywords

parenting style; quality of life; type 1 diabetes; responsiveness

Introduction

Approximately 2 per 1000 children under age 20 years in the United States suffer from type 1 diabetes, making it the second most common chronic disease in children (LaPorte, Matsushima, & Chang, 1995). The child depends on lifetime insulin administration to avoid the severe acute and long term health consequences of high blood glucose levels (American Diabetes Association [ADA], 2005; Diabetes Control and Complications Trial Research Group [DCCT], 1994). The management of type 1 diabetes is complex and intensive, representing a substantial challenge for the family and for the health system (Sullivan-Bolyai, Knafl, Deatrick, & Grey, 2003). Self-management activities include multiple daily insulin injections or use of an insulin pump, blood glucose monitoring several times daily, regulation of dietary intake, regular physical activity, and problem solving to correct unwanted blood glucose fluctuations (ADA, 2005; Laffel, Pasquarello, & Lawlor, 2006).

Given the nature of the diabetes management regimen, it is not surprising that children and adolescents with type 1 diabetes demonstrate poorer quality of life than that of healthy children (Spezia, 2003). Quality of life is a construct that includes emotional, physical, and social well-being (Rubin & Peyrot, 1999) and represents an important outcome in the management of chronic disease such as type 1 diabetes (Sawyer et al., 2005; Cameron, 2003). Diabetes-related quality of life has been associated with adherence (Wiebe et al., 2005) and metabolic control (Guttmann-Bauman, Flaherty, Strugger, & McEvoy, 1998; Hoey et al., 2001) although it is unclear as to whether optimal glycemic control is the cause or the effect of improved quality of life (Anderson, Miller, Auslander, & Santiago, 1981).

Previous cross-section research has shown an association between several aspects of family functioning and diabetes-related quality of life. Higher levels of family adaptability and cohesion were associated with diabetes-specific quality of life (Grey, Boland, Yu, Sullivan-Bolyai, & Tamborlane, 1998), while paternal involvement (Wysocki & Gavin, 2006) and family conflict (Laffel et al., 2003) were associated with general quality of life. In addition, higher warm and caring family behaviors were related to diabetes management (Whittemore, Urban, Tamborlane, & Grey, 2003). Thus, the influence that parents exert in achieving optimal quality of life is supported by previous research (Carroll & Marrero, 2006; Gillibrand & Stevenson, 2006).

Seminal research conducted by Baumrind (1991) conceptualized parenting style as several specific behaviors intended to influence, teach, and control a child's behavior (Kerr, Stattin, Biesecker & Ferrer-Wreder, 2003). Authoritative parenting style was categorized as a function of two dimensions: demandingness and responsiveness (Maccoby & Martin, 1983). Parental demandingness refers to parental behaviors that are oriented to set clear and reasonable boundaries with the purpose of actively monitoring a child's activity and maintaining structure and regimen in the child's life. Parental responsiveness is characterized by parental warmth and support, being affectionate and accepting, providing comfort, being involved in the child's academic and social development, and recognizing the child's achievement (Darling & Steinberg, 1993).

Authoritative parenting style, defined as high demandingness and responsiveness, contributes to children's well-being and quality of life across diverse communities of children and a wide spectrum of topics, including overweight (Rhee, Lumeng, Applugliese, Kaciroti, & Bradley, 2006); internalizing and externalizing behaviors (Aunola & Nurmi, 2005); dietary behavior (Kremers, Brug, de Vries, & Engels, 2006); school performance (Dornbusch, Ritter, Leiderman, Roberts, Fraleigh, 1987; Lamborn, Mounts, Steinberg, Dornbusch, 1991); school adjustment (Simons-Morton & Crump, 2003); cancer (Deatrick, 2006); substance use (Cohen & Rice, 1997); violence (Miller, Dilorio, Dudley, 2001); and sexual risk-taking (Huebner & Howell, 2003). Given that children with type 1 diabetes depend on their parents for the management of the condition, Davis, Delamater, Shaw and collaborators (2001) have argued that parenting style "may be a more specific predictor of diabetes outcome" than family cohesion and conflict.

This study investigates the relationship of parent responsiveness and demandingness to type 1 diabetes-related quality of life. Because these general parenting constructs may be associated with diabetes-specific family variables known to be associated with diabetes-related outcomes, we assess and control for relationships with diabetes-related conflict and parent responsibility-sharing in the analyses. We hypothesize that children and adolescents with type 1 diabetes who perceived their parents as being more responsive and demanding will report higher levels of diabetes-related quality of life.

Method

Study design, participants and procedures

The data for this study were collected as part of an efficacy study testing the feasibility and outcomes of a diabetes personal trainer intervention for the promotion of diabetes self-management skills among adolescents diagnosed with type 1 diabetes; outcomes of this study are presented elsewhere (Nansel, Iannotti, Simons-Morton, et al., 2007). In that analysis, no intervention effect was observed for the quality of life worry and satisfaction subscales; a marginal association was observed for quality of life impact subscale. For the present study, data from baseline assessment and 12-month follow-up were utilized.

Subjects were recruited from two pediatric endocrinology clinics in Baltimore, Maryland. Inclusion criteria included a diagnosis of type 1 diabetes for a minimum of one year, age 11 to 16 years, English-speaking/writing, and no comorbid psychiatric diagnosis or other chronic illness requiring daily medical management. Potential participants were identified by the pediatric endocrinologist or diabetes educator and recruited during routine clinic visits. Informed written consent was obtained from caregivers and assent from children. All assessments were conducted as in-person interviews by trained interviewers not affiliated with the clinic either in the participant's home or at another convenient location selected by the family. The study protocol was approved by the National Institute of Child Health and Human Development Institutional Review Board (IRB), and the Western IRB (for the participating clinical sites).

Measures

Quality of life—Diabetes-related quality of life was measured at baseline and 12-month follow-up using the Diabetes Quality of Life scale (DQOL) (Ingersoll & Marrero, 1991). This child self-report measure assesses three dimensions of quality of life – impact (23 items), worry (11 items), and satisfaction (17 items). Response options are provided on a 5-point Likert scale, and items were scored such that a higher score indicates greater quality of life. A mean score was first calculated for each subscale, and then the total quality of life score was calculated as the mean of the three subscales. Cronbach's α coefficient for the total scale was .75 at baseline and .81 at 12-month follow-up.

Parenting style—Parenting style was assessed at baseline and at 12-month with the Authoritative Parenting Index (Jackson, Henriksen, & Foshee, 1998). This child-report measure consists of two subscales representing dimensions of parenting style: demandingness (7 items) with Cronbach's α coefficient of 0.67 for baseline and .66 for 12 months; and, responsiveness (9 items) with a 4-point Likert scale indicating degree of agreement or disagreement. Cronbach's α coefficient in this study was 0.88, baseline and 12-month follow-up.

Diabetes-related parent-child conflict—At baseline, children completed the conflict subscale of the Diabetes Responsibility and Conflict Scale (Rubin, Young-Hyman, & Peyrot, 1989), a self-report measure of diabetes-related conflict with items querying the frequency of conflict related to various diabetes-related management activities. The conflict scale consists of 13 items (Cronbach's α = 0.92) with a 5-point Likert scale indicating frequency of conflict.

Parent sharing of responsibility for diabetes management—This measure assesses parent and child responsibility for 29 diabetes management activities, and was adapted using key diabetes management tasks from the Diabetes Independence Survey (Wysocki et al., 1996) with response options from the Diabetes Family Responsibility Scale (DFRS)

(Anderson, Auslander, Jung, Miller, & Santiago, 1990). At baseline, children were asked who takes responsibility for each diabetes care activity: 1 = child, 2 = both child and parent, and 3 = parent. A higher score thus indicates greater level of parental responsibility for diabetes management. Cronbach's alpha was .83 (26 items).

Statistical analyses

Means, frequencies and percentages were used to describe the sample characteristics. Bivariate relations among variables were assessed using Pearson correlations. The relationship of the parenting style constructs responsiveness and demandingness to diabetes quality of life at baseline and at 12 months was analyzed using multivariate linear regression analyses (SPSS, Inc; Chicago, 2000). All analyses controlled for age, gender, and duration of diabetes. In addition, diabetes-related parent-child conflict and parent responsibility-sharing were included in the model to determine the effect of parenting style constructs on quality of life beyond that explained by the possible association of parenting style with conflict and responsibility-sharing. To determine the effect of parenting style constructs at baseline on the change in quality of life over a 12-month period, a model was fit for quality of life at each assessment time period –baseline and 12-month follow-up. To control for possible intervention effects, which are not the focus of this study, the 12-month model included treatment group assignment as a covariate. In addition, to determine whether the parenting style constructs were associated with 12-month quality of life beyond their association with baseline quality of life, baseline quality of life was also included as a covariate in the 12-month model.

Results

Descriptive and bivariate analysis

Table 1 shows baseline subjects' demographics information and diabetes-related characteristics of the sample. A total of 81 children were enrolled in the study; 69 were retained through the 12-month follow-up. No differences in demographic or diabetes-related characteristics were observed between those who were and were not retained through 12-month follow-up. Table 2 presents the correlation matrix of 12-month DQOL with all the independent variables of the study. Diabetes-related quality of life was significantly associated with parent responsiveness, as well as child age and parent-child conflict.

Hierarchical multiple regression analyses

Table 3 shows the final hierarchical multiple regression models at baseline and 12-month follow-up indicating the relative association of parent responsiveness and demandingness with diabetes quality of life after controlling for the potential confounders of gender, duration of illness, parent-child conflict, and parent responsibility-sharing.

At baseline, after controlling for age, gender, duration of type 1 diabetes, parent-child conflict and parent responsibility-sharing, parent responsiveness was significantly associated with diabetes quality of life. The final model explained 15% of the variance in diabetes quality of life impact, $F = 2.96$, $P = 0.01$. Similarly, in the 12-month follow-up model after controlling for the same potential confounders as well as treatment group assignment and baseline quality of life, parent demandingness remained a predictor of diabetes quality of life. The 12-month follow-up model explained 39% of the variance in diabetes quality of life, $F = 5.76$, $P = .00$.

Discussion

Parenting responsiveness is a relevant family characteristic associated with diabetes-related quality of life, even after controlling for demographic characteristics and important parent-child diabetes-specific behaviors (Davis et al., 2001). This association was consistent across

baseline and 12-month follow-up, even after controlling for baseline quality of life, suggesting that parent responsiveness contributes to improved diabetes-related quality of life. Theoretical perspectives on parenting indicate that parents function as agents of socialization, influencing their children's behavior by creating an emotional climate characterized by parental warmth and support and clear establishment of boundaries (Darling & Steinberg, 1993). This socialization would be expected to extend to the management of a chronic illness such as diabetes, in which disease management impacts most or all dimensions of the child's life (Laffel et al., 2006).

Findings from this study are consistent with previous cross-sectional research indicating that warm and caring family behaviors are associated with better quality of life (Faulkner & Chang, 2007; Whittemore et al., 2003). A more responsive climate from parents may help adolescents to cope with the stressors related to managing their disease, thus feeling more optimistic and confident (Davidson, Penney, Muller, & Grey, 2004). Parental demandingness was not associated with diabetes related quality of life, however. Thus, while demandingness is a highly relevant construct for decreasing risk of adolescent problem behavior (Aunola & Nurmi, 2005), it does not appear to impact diabetes-related quality of life.

Several study limitations are worth noting. First, parenting style was assessed by child report only, as measuring parenting style via parent report is subject to issues of social desirability bias. As such, findings may be influenced by observer bias or shared method variance. However, by controlling for baseline quality of life, the potential for bias is minimized. In addition, the parenting style constructs were assessed as the two dimensions of responsiveness and demandingness, rather than as a four-fold typology. Because creating such a typology from the two continuous measures typically eliminates approximately half of the subjects (Jackson et al., 1998), our sample size was insufficient for such an approach. Nevertheless, this study provides new findings addressing constructs previously neglected in the literature, and adds to our knowledge regarding the role of parenting style in children with type 1 diabetes. The sample included children from two clinical practices serving urban, suburban, and rural patients, and the resulting sample was similar to the ethnic distribution reported in previous type 1 diabetes studies (Laffel et al., 2003; Davis et al., 2001). The prospective study design provides stronger support for the role of parenting style in promoting diabetes quality of life than would be provided by cross-sectional associations.

Findings from this study have implications for the delivery of health care services and the development of interventions for children with type 1 diabetes and their families. A relationship-focused intervention approach has demonstrated efficacy in children with other pediatric illnesses (Skinner, John, & Hampson, 2000) and is indicated within the context of family management of type 1 diabetes. While the provision of health care is necessarily focused on medical care and outcomes, optimal chronic illness care for children must also equip parents with the knowledge and skills to promote their child's emotional welfare. Such efforts may need to be tailored to individual parenting skills and behaviors, as parents will hold differing assumptions regarding their role and the parent-child relationship. Cultivation of responsiveness in the parent-child relationship along with appropriate levels of autonomy-granting will facilitate a nurturing environment for parent-child communication and teamwork in disease management, promoting optimal psychosocial adaptation to the demands of a chronic illness.

Authoritative parenting style has demonstrated utility in understanding child and adolescent development across a range of health outcomes. This study contributes to the understanding of the role of parent responsiveness in promoting diabetes quality of life among children with type 1 diabetes. It is notable that the relationships observed in this study were independent of diabetes-specific parent-child constructs commonly studied in relationship to diabetes

outcomes, indicating that parent responsiveness influences child quality of life via mechanisms not fully addressed by previous research addressing diabetes outcomes among children. Additional research is needed to clarify further the role of parenting style has on diabetes-related quality of life. Findings have relevance for future research and clinical care with children with type 1 diabetes and other chronic illnesses.

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Table 1
Sample Demographic and Diabetes-Related Characteristics ($N=81$)

	N	%
Gender		
Male	36	44
Female	45	56
Race/ethnicity		
White	69	85
Black	9	11
Other	3	4
Insulin regimen		
Insulin pump	51	63
Multiple daily injections	30	37
Mother's education level		
High school or less	15	19
Some college or tech degree	23	29
College degree or higher	41	52
Father's education level		
High school or less	11	16
Some college or tech degree	21	30
College degree or higher	38	54
Family income		
Under \$40,000	15	18
\$40,000-\$69,999	17	21
\$70,000-\$99,999	17	21
\$100,000-over	32	40
	Mean ± S.D	Minimum-Maximum
Age (years)	13.3 ± 1.7	11-16
Duration of diabetes (years)	7.7 ± 3.7	5.2-14.9
Diabetes quality of life		
Baseline	4.2 ± .5	2.5-4.9
12-month	4.1 ± .5	2.7-4.9
Parenting style		
Demandingness	3.2 ± .4	2.3-4.0
Responsiveness	3.2 ± .5	1.3-4.0
Diabetes related parent-child conflict	1.8 ± .8	1.0-4.0
Parent responsibility-sharing	39.4 ± 7.0	27.0-62.0

Note: For diabetes quality of life, parenting style, conflict, and parent responsibility-sharing, higher scores indicate higher levels of that particular dimension; for example, greater quality of life, greater conflict, greater parent responsibility.

Table 2
 Correlation of demographic and disease characteristics, diabetes-specific parent-child behaviors, and diabetes quality of life

Variable	1	2	3	4	5	6	7	8
1. Age								
2. Duration of Diabetes	.36***							
3. Diabetes Quality of Life: Baseline	-.38***	-.06						
4. Diabetes Quality of Life: 12-month	-.28*	-.17	-.61***					
5. Parent Demandingness	-.24*	-.22†	.26***	.21***				
6. Parent Responsiveness	-.26*	-.21	.39***	.42***	.22†			
7. Parent-Child Conflict	.05	-.04	-.18	-.24*	-.05	-.02		
8. Parent Responsibility-Sharing	.34***	.10	-.09	-.19	-.13	.02	-.03	

* $P \leq .05$;

** $P < .01$;

† $P < .10$

Table 3
Multiple regression of diabetes quality of life at baseline and 12-month follow-up on baseline parenting style

Variable	β^{\ddagger}	t	P
Quality of Life: Baseline ($R^2 = .22$, Adjusted $R^2 = .15$, $F = 2.96$, $P = .01$)			
Age	-.28	-2.44	.02
Gender	-.16	-1.57	.12
Duration of Diabetes	.11	.99	.32
Parent-Child Conflict	-.14	-1.13	.17
Parent Responsibility-Sharing	-.07	-.67	.50
Parent Responsiveness	.23	2.14	.04
Parent Demandingness	.06	.51	.60
Quality of Life: 12-month ($R^2 = .47$, Adjusted $R^2 = .39$, $F = 5.76$, $P = .00$)			
Age	.07	.62	.53
Gender	.05	.52	.60
Quality of Life: Baseline	.51	4.36	<.001
Duration of Diabetes	-.12	-1.11	.26
Treatment Group Assignment	-.05	-.53	.59
Parent-Child Conflict	-.16	-1.61	.11
Parent Responsibility-Sharing	-.15	-1.47	.14
Parent Responsiveness	.22	2.10	.04
Parent Demandingness	-.00	-.05	.96

\ddagger Standardized beta coefficients.