Generic and Diabetes-specific Parent–Child Behaviors and Quality of Life Among Youth with Type 1 Diabetes

Jill Weissberg-Benchell,[1] PhD, Tonja Nansel,[2] PhD, Grayson Holmbeck,[3] PhD, Rusan Chen,[4] PhD, Barbara Anderson,[5] PhD, Tim Wysocki,[6] PhD, Lori Laffel,[7] MD, and For the Steering Committee of the Family Management of Diabetes Study

[1]Children's Memorial Hospital, [2]National Institute of Child Health and Development, [3]Loyola University, [4]Georgetown University, [5]Texas Children's Hospital, [6]Nemours Children's Clinic, and [7]Joslin Diabetes Center

Objective To evaluate associations among parent–child behaviors and generic and diabetes-specific health-related quality of life (HRQOL) in a multi-site sample of youth with type 1 diabetes. **Method** One hundred and twenty-one youth and their primary caregivers completed measures of parent–child behaviors, child HRQOL, and participated in an observed family interaction task. **Results** Diabetes-specific parent–child variables were associated significantly with both generic and diabetes-specific HRQOL above and beyond the contributions of demographic and generic parent-child variables, accounting for between 13% and 31% of the variance in HRQOL. Diabetes-specific family conflict and negative diabetes-specific family communication were associated with lower HRQOL. Collaborative parent involvement in diabetes care was associated with higher levels of HRQOL. **Conclusions** Interventions that target diabetes-specific family interactions will be beneficial to the quality of life of children with type 1 diabetes.

Key words: family conflict; family interactions; parent–child behavior; quality of life; type 1 diabetes.

Researchers have begun to recognize the important role of quality of life in evaluating the effectiveness of medical and psychosocial interventions (Sawyer et al., 2006; Seid, Varni, Segall, & Kurtin, 2004; Varni, Limbers, & Burwinkle, 2007). Health-related quality of life (HRQOL) has been defined as an individual's subjective experience of illness and the impact that illness and its treatment has on the individual's functioning across a variety of domains (Cella, 1996; Seid, Varni, Rode, & Katz, 1999; Spieth & Harris, 1996; Varni, Seid, & Kurtin, 2001). The key domains of HRQOL include physical, psychological, and social functioning (Cella, 1996, Varni et al., 2001) as well as the impact of illness on the ability to engage in activities of daily living (Cella, 1996; Spieth & Harris, 1996).

HRQOL has been assessed using both generic and illness-specific measures. Generic measures allow for the assessment of common dimensions among both healthy and chronically ill children, and allow for comparisons across populations (Drotar, 1997; Palermo et al., in press; Patrick & Dego, 1989; Quittner, Davis, & Modi, 2003; Schmidt, Peterson, & Bullinger, 2003). However, generic measures may be insensitive to a number of important disease-specific issues (Cella, 1996; Quittner et al., 2000). Disease-specific measures assess these illness-specific outcomes and allow for the assessment of clinically relevant issues within a particular illness group (Holmbeck et al., 2003). Varni and colleagues (2001) propose a modular approach that includes both generic and illness-specific measures.

Pediatric measures of HRQOL must address developmental issues inherent in this population. Parent-report measures have been used to avoid problems inherent in obtaining pediatric patient self-report, but the accuracy of only using parent-proxy measures has been questioned (Achenbach, McConaughy, & Howell, 1987; Guyatt, Juniper, Griffith, Feeny, & Ferrie,1997; Varni et al., 1999). Since the validity, reliability, and meaningfulness of children's responses to HRQOL measures may fluctuate over time (Varni et al., 2001), assessment of

All correspondence concerning this article should be addressed to Dr. Jill Weissberg-Benchell, Children's Memorial Hospital, Department of Child and Adolescent Psychiatry, 2300 Children's Plaza, Box 10, Chicago, Illinois 60614, USA. E-mail: jwbenchell@childrensmemorial.org

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HRQOL in a pediatric population should optimally include both child and parent perspectives.

Interest in assessing HRQOL among youths with type 1 diabetes (T1DM) has increased recently, with most studies assessing the relationship between metabolic control and HRQOL (Hesketh, Wake, & Cameron, 2004; Graue, Wentzel-Larsen, Hanestad, Batsvik, & Sovik, 2005; Whittemore, Urban, Tamborlane, & Grey, 2003) or assessing the impact of insulin pump therapy on HRQOL (Barnard, Lloyd & Skinner, 2007; Cogen, Henderson, Hansen & Streisand, 2007; Juliusson, Graue, Wentzel-Larsen, & Sovik, 2006; Opipari-Arrigan et al., 2007). Only one study used both generic and diabetes-specific measures of HRQOL (Valenzuela et al., 2006). This study assessed both child and parent perspectives regarding the impact of pump therapy on HRQOL.

Despite the vital role parents play in a child's psychosocial adjustment and diabetes management (Anderson, et al., 2002; Helgeson, Snyder, Escobar, Siminerio, & Becker, 2007; Silverstein et al., 2005; Wiebe et al., 2005; Wysocki et al., 1996), relatively few studies have evaluated the relationship between parent–child behaviors and HRQOL. For the purpose of the present article, parent–child behaviors relevant to a child's adaptation and psychosocial functioning that are not directly related to diabetes issues are referred to as generic parent–child behaviors. These behaviors may include family cohesion, adaptability, warmth, conflict, problem-solving, and communication (Drotar, 1997; Holmbeck, Greenley, Coakley, Greco, & Hagstrom, 2006). Parent–child behaviors directly related to diabetes-specific care are referred to as diabetes-specific parent–child behaviors and may include diabetes-specific family conflict, adherence, sharing of diabetes responsibility, and collaborative involvement in diabetes care (Cameron et al., 2008). With respect to generic parent–child behaviors, HRQOL has been associated with family adaptability (Grey, Boland, Yu, Sullivan-Bolyai, & Tamborlane, 1998) and with less parent control and overprotection (Graue et al., 2005). With respect to diabetes-specific parent–child behaviors, HRQOL has been associated with warm and caring diabetes-related behaviors (Faulkner & Chang, 2007; Whittemore et al., 2003) and lower diabetes-specific conflict (de Wit, Pouer, Gemke, Dalemarre-vandewaal, & Snoek, 2007; Hood, Butler, Anderson, & Laffel, 2007; Laffel, Connell, et al., 2003). Findings from studies investigating parents' involvement in their child's diabetes management have been inconsistent, however, with some studies finding no association with HRQOL (Laffel, Vangness, et al., 2003; Murphy, Wadham, Rayman, & Skinner, 2007) and others finding improved HRQOL with parental involvement and support (Graue et al., 2005).

The purpose of the present study was to evaluate associations between parent–child behaviors and the child's quality of life in families of children with T1DM, grounded in the risk and resistance model (Wallander, Varni, Babani, Banis & Wilcox, 1989; Wallander & Varni, 1998) which provides a theoretically driven, developmentally oriented model that facilitates the evaluation of multi-method, multi-informant, and multi-dimensional data (Holmbeck et al., 2003). Specifically, we explored whether parent–child behaviors (both generic and diabetes-specific) were related to a child's quality of life (both generic and diabetes-specific) as reported by both child and parent. Generic aspects of parent–child behaviors were assessed with measures of parenting style and parental authority. Past research suggests that warm and caring parenting styles (resistance factors) are associated with greater adherence (Davis et al., 2001) and self-efficacy (Butler, Skinner, Gelfand, Berg & Wiebe, 2007), whereas psychologically controlling parenting styles (risk factors) are related to depressed mood and worse metabolic control (Butler et al., 2007; Davis et al., 2001). The association between parenting style and HRQOL, to our knowledge, has not been evaluated. Diabetes-specific aspects of parent–child behaviors were assessed with measures of diabetes-specific conflict, sharing of diabetes management responsibilities, quality of parent involvement in diabetes care, and an assessment of positive and negative communications based on data from a videotaped parent–child discussion of diabetes-specific difficulties. HRQOL was assessed with child-report and parent-proxy reports of the child's generic and diabetes-specific HRQOL. The analyses also included age and gender as covariates, as both demographic variables have been associated with HRQOL in previous studies (Naughton et al., 2008).

The hypotheses of this study, grounded in the theoretical framework of the risk and resistance model, are framed from the perspective of promoting resistance factors. With respect to generic parent–child behaviors, we hypothesized that parents who were more responsive and less demanding (as measured by the authoritative parenting index), who exerted less psychological control (as measured by the psychological control scale) and who were perceived to have legitimate parental authority (as measured by the parental authority scale) would have children who reported higher levels of HRQOL. With respect to diabetes-specific parent–child behaviors, we hypothesized that families with lower levels of diabetes-specific conflict (as measured by the diabetes conflict

scale) and/or negative interactions around diabetes-specific discussions (as measured by observed family interactions) would report higher levels of HRQOL. We also hypothesized that families who shared in the responsibility for diabetes tasks (as measured by the diabetes family responsibility scale), and parents who remained involved in their child's diabetes care (as measured by the collaborative parent involvement scale) would report higher levels of HRQOL. Finally, we hypothesized that diabetes-specific parent–child behaviors would account for unique variance in HRQOL, above and beyond those accounted for by demographic and generic parent–child behavior variables.

Methods

Participants

Children with T1DM and their primary caregiver were recruited from four large pediatric tertiary care diabetes centers in Boston, MA, Chicago, IL, Houston, TX, and Jacksonville, FL, to participate in a multi-site pilot and feasibility intervention study. This study reports on data obtained from the baseline assessment, prior to assignment of families to treatment groups. Eligible patients and their caregivers were identified and recruited to participate by trained research staff at each site. Eligibility criteria for youth included: 9–14.5 years of age; duration of T1DM for at least 1 year; established diabetes care at the enrolling center; mean HbA_1c over the last 8 months <13.0%; no other major chronic disease or cognitive disability as documented in the medical chart; and no documented history of psychiatric hospitalization within the prior 6 months. Enrollment criteria for parents/caregivers included: at least a 5th grade reading fluency in English; no parent-reported history of a significant psychiatric history that would impact their ability to participate in the study; and a working telephone service. Enrollment criteria were assessed first via chart review and then via direct interview with child and parent/guardians. All parents or other legal caregivers signed institutionally approved informed consent forms and all youths assented to participation using each center's approved procedures.

One hundred and sixty-seven families were invited to participate in the study. Thirty-six declined the invitation and an additional 10 declined when contacted to schedule the initial assessment. These 46 families were not significantly different from those who agreed to participate on hemoglobin A1c (HbA1c), age, gender, ethnicity, diabetes regimen, or duration of diabetes. At each site, 30–32 families participated, resulting in a final sample of 121 youth and their caregivers (73% participation rate). The mean age of the youth was 12.1, $SD = 1.6$ years; the duration of their diabetes was 64.85, $SD = 37.76$ months; the mean HbA1c was 8.10, $SD = 1.14$; 49.59% were female; 71.7% were Caucasian, 11.7% were African American, 9.2% were Hispanic, the remaining were of other ethnicities or included those who chose not to report their ethnic group. Thirty-two percent used a insulin pump, 35% used a basal-bolus injection regimen and 33% used at conventional injection regimen. Ninety-one percent of youth lived in families with two or more adults in the home. Ninety-two percent of parent participants were mothers, 6% were fathers, and 2% were other relatives. Parent education levels were 2.5% with less than a high school diploma, 17.0% with a high school diploma, 22.0% with some college education, 32.3% with a college degree, and 13.6% with a graduate degree. The remaining chose not to report their education level. Seventy-seven percent of parents reported an annual income of $50,000 or more.

Procedure

Baseline assessments were conducted in the families' homes by two-person interviewing teams not affiliated with the clinics. Parents and youths completed assessment instruments simultaneously, but with different interviewers and in different areas of the home to allow for privacy of responses. Observational data of diabetes-specific family interactions were collected during videotaped interactions in their home.

Measures

Means, standard deviations, and ranges for all measures used in this study are presented in the Supplementary Material online.

Quality of Life Variables

Pediatric Quality of Life Generic Core (PedsQL). The 23-item measure of HRQOL assesses four generic domains: Physical functioning, Emotional functioning, Social functioning, and School functioning. The total score across all domains was used for the present study (Seid, Varni, Cummings, & Schonlau, 2006; Varni, Seid, Knight, Uzark, & Szer, 2002). Internal consistency as measured by Cronbach's α for the total score was .88 for both the parent-proxy and the child reports. Items were scored on a five-point response scale, ranging from 0 = never a problem to 4 = almost always a problem (Varni, Seid, & Rode, 1999; Varni, et al., 2001). Reliability and validity for this measure are supported in the literature (Varni et al., 1999, 2001).

Pediatric Quality of Life Diabetes Module (PedsQL, DM). The 28-item measure of HRQOL assesses five diabetes-specific

domains: Diabetes Symptoms, Treatment Barriers, Treatment Adherence, Worry, and Communication. The total score across all domains was used for the present study based on factor analytic research supporting the use of a total diabetes quality of life score (Nansel, Weissberg-Benchell, Wysocki, Laffel, & Anderson, 2008). Internal consistency for the total score was .87 for both the parent-proxy and the child reports. Items were scored on the same response scale as the Generic Core (Varni et al., 2003).

Generic Parent–Child Behaviors

Parenting Style. Two dimensions of parenting style, parental responsiveness and parental demandingness were assessed using the 16-item youth self-report Authoritative Parenting Index developed by Jackson and colleagues (Jackson, Henriksen, & Foshee, 1998). The measure demonstrates a factor structure consistent with the theoretical model and acceptable reliability (Jackson, Henricksen, & Foshee, 1998). Internal consistency for this sample for the responsiveness and demandingness subscales were .76 and .67, respectively. In addition, psychological control was assessed using the 8-item Psychological Control Scale, a measure designed to assess intrusive, manipulative parenting behaviors (Barber, 1996). Studies assessing item content, factor loadings, and Cronbach's α demonstrate acceptable reliability and validity (Barber, 1996). Internal consistency for this sample was .70.

Parental Authority. Parents and youths completed Smetana's (1994, 1995, 2002) 21-item measure of parental authority to make rules about youth's behaviors and activities. Reliability and validity of the measure were assessed by the original authors of the measure and found to be acceptable (Smetana & Asquith, 1994). Internal consistency for parent and youth reports for this sample were .84 and .76, respectively.

Diabetes-specific Parent–Child Behaviors

Diabetes Conflict Scale. This 15-item scale used 3-point likert responses and was completed by both youth and their parents, yielding an estimate of diabetes-specific family conflict (Hood et al., 2007; Rubin, Young-Hyman, & Peyrot, 1989). Parent and child indicated the degree of conflict they experienced over a range of diabetes-specific variables. Previous research demonstrates acceptable internal consistency (Hood et al., 2007). Parent and child reports are correlated with HbA1c (Hood et al., 2007). Internal consistency for the parent and child reports were .90 and .95, respectively

Diabetes Family Responsibility Questionnaire (DFRQ). This is a 17-item questionnaire on which caregivers and children with T1DM rated the degree to which responsibility for each diabetes management task is a Parent Responsibility, a Shared Responsibility, or a Child Responsibility (Anderson, Auslander, Jung, Miller, & Santiago, 1990). Higher scores indicate increasing levels of parent responsibility for diabetes management. Acceptable internal consistency, test–retest reliability and parent–child agreement have been reported consistently in a number of studies that have used this instrument. Greater parent–child discordance in scores on this measure has been associated with higher HbA_{1C} levels (Anderson et al., 1990). The internal consistency for this sample's parent and child reports were .67 and .75, respectively.

Collaborative Parent Involvement Scale. Children completed a 12-item measure assessing parent collaborative involvement in diabetes management (Nansel et al., 2009). The measure demonstrates expected age-related changes, differential relationships with adherence, and strong internal consistency and concurrent validity (Nansel et al., 2009). Internal consistency for the current sample was .91.

Family Videotaped Interactions. Observational data of family interactions were collected during a 10 min problem solving discussion about a diabetes-specific issue. The discussion was videotaped and coded by two trained raters (who were blind to the family's treatment group assignment) using the Interaction Behavior Code (IBC) scoring system of Prinz and colleagues (Prinz, Foster, Kent, & O'Leary, 1979) which has been employed reliably in past research (Wysocki et al., 2000, 2008). Raters were trained on demonstration tapes until they consistently achieved >80% agreement with a consensus rating of the same tapes by experienced raters. The raters scored 31 behaviors for each individual yielding summary scores for positive (e.g., praise, affirmation) and negative (e.g., yelling, ridiculing) communication behaviors in. Raters also scored four dyadic behaviors yielding summary scores for negative reciprocity (e.g., mutual criticism), positive reciprocity (e.g., mutual approval), problem resolution, and effectiveness of problem solving (e.g., the family's ability to identify the issue, verify the problem, generate plausible solutions, and evaluate the potential effectiveness of the proposed solutions). Summary ratings were assessed on a 3-point likert scale; values for each summary rating were computed by averaging the raters' scores. For the present analyses, three variables were coded for the family as a whole and entered into the analyses: (a) family interactions regarding the effectiveness of their problem solving processes, (b) the frequency of their negative interactions, and (c) the frequency of their positive interactions. As an indicator of inter-rater reliability, intra-class correlations for the three variables were: .81, .76, and .58, respectively.

Table I. Correlation Matrices for Assessment Variables ($N = 121$)

	1	2	3	4	5	6	7	8	9
Outcome variables									
1 Diabetes HRQOL (C)									
2 Diabetes HRQOL (P)	0.16								
3 Generic HRQOL (C)	0.70**	0.12							
4 Generic HRQOL (P)	0.19*	0.65**	0.34**						
Independent variables in Model 1									
1 Age									
2 Sex	0.07								
3 Parent responsive (C)	−0.05	−0.21*							
4 Parent demanding (C)	0.18	−0.18*	0.51**						
5 Psych. control (C)	0.04	0.14	−0.68**	−0.39**					
6 Authority (C)	−0.17	0.02	−0.05	0.14	0.00				
7 Authority (P)	−0.23*	−0.05	−0.08	−0.07	0.16	0.14			
Independent variables in Model 2									
1 Age									
2 Sex	0.07								
3 Family conflict (C)	−0.01	0.10							
4 Parent responsibility (C)	−0.52**	0.03	0.07						
5 Family conflict (P)	0.21*	0.05	0.18*	−0.19*					
6 Parent responsibility (P)	−0.43**	0.11	0.16	0.48**	0.10				
7 Collab. involvement (C)	−0.01	−0.09	−0.14	0.04	−0.15	−0.02			
8 Problem solving (O)	0.02	0.05	0.15	0.08	0.11	0.25**	0.03		
9 Neg. communication (O)	0.14	−0.03	0.18	0.01	0.36**	0.04	0.01	0.22*	
10 Warmth and friendliness (O)	−0.03	−0.08	−0.10	0.04	−0.31**	−0.07	0.18	−0.26**	−0.45**

*$p < .05$; **$p < .01$.

(C), reported by child; (P), reported by parent; (O), observational data.

Statistical Analyses

Associations Between Parent–Child Behavior and HRQOL. We assessed two hypothesized path models to evaluate associations between parent–child behaviors and HRQOL, one for generic and one for diabetes-specific parent–child behaviors (see Supplementary Material). The sample size of 121 participants precluded an evaluation of a single overall model. Completing two separate analyses facilitated data reduction in determining the significant predictors of HRQOL. In addition to these two path models, hierarchical regression analyses were conducted to determine the unique contributions of the significant predictors from the two path models. In all analyses, the outcomes were the child self-reports and the parent-proxy reports of both generic and diabetes-specific HRQOL. The predictors were the generic parent–child variables in the first model (parenting style and parental authority) and diabetes-specific parent–child variables in the second model (parent–child conflict around diabetes, family sharing of diabetes responsibility, family problem-solving during communication of diabetes difficulties, family negative communication of diabetes difficulties, family positive communication of diabetes difficulties, and parent collaborative involvement in diabetes care). Children's age and gender were included in both models as covariates to control their possible effects on HRQOL.

Unique Variance in HRQOL Accounted for by Diabetes-specific Parent–Child Behaviors. Significant predictors from the hypothesized two path models (described above) were then entered into a hierarchical regression analysis to determine the unique variance in HRQOL accounted for by diabetes-specific parent–child behaviors above and beyond the demographic and generic parenting variables.

Mplus Version 5 (Muthen & Muthen, 2006) was used for the path analysis estimates. Missing values were handled with the maximum likelihood estimates method provided by MPlus assuming the values were missing at random. Correlation matrices among the assessment variables are presented in Table I and estimates from hypothesized path models, both standardized and unstandardized, are presented in Table II.

Results

Data screening for possible outliers and multicollinearity was conducted before path analysis. No influential cases

Table II. Estimates from Path Models ($N = 121$)

	Generic QOL (Child)		Diabetes QOL (Child)		Generic QOL (Parent)		Diabetes QOL (Parent)	
	b	β	b	β	b	β	b	β
Model 1								
Age	1.08	0.14	0.41	0.05	0.06	0.01	−1.09	−0.15
	(0.72)	(0.10)	(0.70)	(0.09)	(0.72)	(0.10)	(0.73)	(0.10)
Sex	2.58	0.11	2.20	0.09	1.04	0.04	−1.05	−0.05
	(2.10)	(0.09)	(2.03)	(0.08)	(2.09)	(0.09)	(2.14)	(0.09)
Parent responsive (C)	4.13	0.15	5.31	0.19	4.91	0.18	1.88	0.07
	(3.74)	(0.13)	(3.61)	(0.13)	(3.73)	(0.13)	(3.81)	(0.14)
Parent demanding (C)	−1.02	−0.04	−4.60	−0.15	−3.20	−0.11	−2.81	−0.09
	(3.27)	(0.11)	(3.18)	(0.10)	(3.26)	(0.11)	(3.34)	(0.11)
Psyc. control (C)	−6.42*	−0.25*	−8.69**	−0.34**	−4.23	−0.17	−1.86	−0.08
	(2.95)	(0.12)	(2.86)	(0.11)	(2.94)	(0.12)	(3.00)	(0.12)
Authority (C)	3.15	0.13	2.17	0.09	3.25	0.14	−0.60	−0.03
	(2.17)	(0.09)	(2.11)	(0.09)	(2.17)	(0.10)	(2.22)	(0.10)
Authority (P)	0.05	0.00	0.23	0.01	−0.58	−0.03	0.35	0.02
	(2.76)	(0.12)	(2.70)	(0.12)	(2.55)	(0.11)	(2.61)	(0.11)
Model 2								
Age	1.04	0.14	0.32	0.43	0.61	0.08	−1.09	−0.15
	(0.70)	(0.09)	(0.70)	(0.09)	(0.71)	(0.10)	(0.65)	(0.09)
Sex	2.61	0.11	2.17	0.09	1.63	0.07	−0.59	−0.03
	(1.84)	(0.08)	(1.84)	(0.08)	(1.83)	(0.08)	(1.70)	(0.07)
Family conflict (C)	−0.26**	−0.30**	−0.29**	−0.32**	−0.13	−0.15	0.03	0.03
	(0.07)	(0.08)	(0.07)	(0.08)	(0.07)	(0.08)	(0.06)	(0.08)
Parent responsibility (C)	−0.22	−0.09	0.23	0.09	−0.21	−0.09	−0.31	−0.13
	(0.24)	(0.10)	(0.24)	(0.10)	(0.24)	(0.10)	(0.22)	(0.09)
Family conflict (P)	−0.13	−0.09	−0.12	−0.08	−0.67**	−0.48**	−0.81**	−0.59**
	(0.12)	(0.09)	(0.12)	(0.09)	(0.12)	(0.08)	(0.12)	(0.07)
Parent responsibility (P)	0.46	0.14	−0.14	−0.04	0.11	0.03	−0.08	−0.02
	(0.32)	(0.10)	(0.32)	(0.10)	(0.32)	(0.10)	(0.29)	(0.09)
Parent involvement (C)	8.24**	0.40**	6.80**	0.33**	−0.39	−0.02	−0.04	−0.00
	(1.62)	(0.07)	(1.62)	(0.08)	(1.61)	(0.08)	(1.50)	(0.07)
Problem solving (O)	1.64	0.10	1.68	0.10	−0.37	−0.02	−0.26	−0.02
	(1.39)	(0.08)	(1.38)	(0.08)	(1.36)	(0.08)	(1.26)	(0.08)
Neg. communication (O)	−1.48	−0.06	−5.50*	−0.21*	−1.22	−0.05	−0.63	−0.02
	(2.41)	(0.09)	(2.40)	(0.09)	(2.36)	(0.09)	(2.19)	(0.09)
Warmth & Friendliness (O)	−1.09	−0.05	−0.53	−0.02	0.46	0.02	0.23	0.10
	(2.17)	(0.09)	(2.15)	(0.09)	(2.11)	(0.09)	(1.96)	(0.09)

*$p < .05$; **$p < .01$.

(C), reported by child; (P), reported by parent; (O), observation data; b, unstandardized estimates; β, standardized estimates; QOL, quality of life; Standard errors are in parentheses.

were found using Cook's $d \geq 1$ criteria examined for the two hypothesized path models separately. The VIF (variance inflation factor) for all predictors was < 3, indicating no significant multicollinearity among the IVs (Tabachnick & Fidel, 2007).

Associations Between Generic Parent–Child Behaviors and HRQOL

For hypothesized Path Model 1 (Table II), parent psychological control reported by the child was the only significant predictor of HRQOL among the generic parent–child variables. More psychological control reported by the child was associated with lower generic HRQOL ($b = -6.42$, $p < .05$) and lower diabetes HRQOL (-8.69, $p < .01$) reported by the child, after controlling other variables in the model. However, it was not associated with parent-proxy report of generic or diabetes-specific HRQOL. The finding that psychological control was related to HRQOL was consistent with our hypothesis.

Associations Between Diabetes-specific Parent–Child Behaviors and HRQOL

For hypothesized Path Model 2 (Table II), diabetes-specific parent–child conflict was significantly associated with both generic and diabetes-specific HRQOL, as reported by both the child and parent. For child-reported measures, more family conflict was significantly related to lower generic HRQOL ($b = -0.26$, $p < .001$) and lower diabetes HRQOL ($b = -0.29$, $p < .001$). For parent-reported measures, more family conflict was significantly associated with lower generic HRQOL ($b = -0.67$, $p < .001$) and lower diabetes HRQOL ($b = -0.81$, $p < .001$). Similarly, for the videotaped family discussions around diabetes-specific difficulties, higher scores on observed negative communications were related to worse diabetes-specific HRQOL, as reported by the child ($b = -5.50$, $p < .05$). Findings that diabetes-specific family conflict and negative communication are associated with HRQOL is consistent with our hypotheses.

More collaborative parent involvement in the diabetes regimen (as reported by the child) was significantly associated with better generic HRQOL ($b = 8.24$, $p < .001$) and better diabetes HRQOL ($b = 6.80$, $p < .001$) with other IVs controlled, consistent with our hypothesis. However, family sharing of responsibility for diabetes tasks was not significantly related to either generic or diabetes-specific HRQOL. In addition, children's age and gender were not significant predictors of HRQOL in either of the two hypothesized path models.

Unique Variance in HRQOL Accounted for by Diabetes-specific Parent–Child Behaviors

To estimate unique variance in both generic and diabetes-specific HRQOL contributed by diabetes-specific parent–child behaviors, significant predictors from the two path analyses described above were entered into hierarchical regression analyses. Age, gender, and psychological control were entered in the first block; conflict, collaborative parent involvement and observed negative family communication were entered in the second block. Generic and diabetes-specific HRQOL reported by child and parent served as the dependent variables in four separate analyses. As shown in Table III, diabetes-specific parent–child variables were associated significantly with both generic and diabetes-specific HRQOL above and beyond the contributions of the demographic and generic parent child variables, accounting for between 13% and 31% of the variance in quality of life. These findings are consistent with those found in the path model analyses, highlighting the importance of diabetes-specific parent–child behaviors in predicting both generic and diabetes-specific HRQOL.

Discussion

The present study assessed the unique contribution of diabetes-specific parent–child behaviors in understanding HRQOL, when demographic and generic parent–child behaviors are already taken into account. Our findings

Table III. Unique Variance in HRQOL

	Generic QOL (Child)		Diabetes QOL (Child)		QOL Generic (Parent)		Diabetes QOL (Parent)	
	b	β	b	β	b	β	b	β
Block 1								
Age	.87	.12	−.10	−.01	.03	0.00	−1.44*	−.20*
Gender	3.44	.15	2.92	.12	1.85	0.08	−.67	−.03
Psych. control (Child)	−8.98**	−.35**	−11.11**	−.42**	−6.57**	−.25**	−1.76	−.07
Variance explained (%)	14.6		18.0		6.2		4.5	
Block 2								
Conflict (Child)	−.19*	−.22*	−.21	−.24	−.10	−.11	.01	.02
Conflict (Parent)	−.06	−.04	−.09**	−.07**	−.62**	−.44**	−.78**	−.56**
Collaborative Involvement	6.86**	.32**	4.84*	.22*	−1.83	−.08	.55	.03
Negative family Communication	−.93	−.04	−5.23*	−.20*	−2.33	−.09	−1.14	−.05
Variance explained (%)	27.8		34.9		30.4		35.2	
F-change (*p*-value)	4.91 (<.01)		6.93 (<.00)		9.30 (<.00)		12.65 (<.00)	
Unique variance (%)	13.2		16.9		24.2		30.7	

*$p < .05$; **$p < .01$. Child, reported by child; Parent, reported by parent; b, unstandardized estimates; β, standardized estimates; QOL, quality of life.

suggest that parent–child behaviors around diabetes issues are important for understanding a child's quality of life, accounting for between 13% and 31% of the variance in a child's HRQOL above and beyond the contributions of the demographic and generic parenting variables These findings add to the current literature on family interactions and HRQOL and underscore the important role of illness-specific family behaviors.

With respect to diabetes-specific parent–child behaviors, the most compelling finding was the role of family conflict in a child's quality of life. Families who reported engaging in more conflict around diabetes-specific issues and who communicated in negative ways when discussing these issues have children with less optimal HRQOL. This finding is consistent with the literature on the detrimental relationship between conflict and adherence as well between conflict and metabolic control (Anderson et al., 2002; Laffel, Connell et al., 2003; Moreland et al., 2004). The negative impact of family conflict on children's overall well-being is also supported in the general child development literature (Laursen, Coy, & Collins, 1998).

We also found that parents who demonstrated a collaborative style of involvement in their child's diabetes care had children who reported more optimal levels of generic and diabetes-specific HRQOL. An increasingly large body of research supports the importance of family teamwork and shared regimen responsibility for metabolic and psychosocial outcomes (Anderson et al., 2002; Hanson, Henggeler, Harris, Burghen, & Moore, 1989; Laffel, Vangsness et al., 2003; Schafer, McCaul, & Glasgow, 1986; Wysocki, Hough, Ward, & Green, 1992). Our findings indicate that with respect to the child's HRQOL, the manner in which parents demonstrate involvement in diabetes management is more important than the specific amount of responsibility taken by the parent. Taken together with previous findings, these results underscore the importance of parents working with their child in caring for the daily diabetes regimen demands, providing both shared responsibility as well as a collaborative style of involvement to enhance both metabolic and psychosocial outcomes.

Our findings regarding generic parent–child behaviors are consistent with the general child psychology literature on the negative impact of psychological control (Barber & Harmon, 2002). Specifically, children in our study who perceived their parents as psychologically controlling reported worse generic and diabetes-specific HRQOL. Psychologically controlling parents use intrusive emotion-focused methods to influence their children, regardless of the child's needs (Barber & Harmon, 2002; Smetana & Daddis, 2002; Steinberg, 2005). This style of parenting inhibits autonomy in children and may lead to the perception of a diminished quality of life.

Limitations of this study include the use of a cross-sectional, rather than a longitudinal design. Therefore, we can not offer information about causal relationships among the variables studied. Only a longitudinal study can clarify the direction of the relationships among parenting behaviors, diabetes-specific behaviors and HRQOL. Although many of the associations were based on predictors and outcomes derived from the same reporter, this was not always the case. Therefore, common method variance interpretations of the data probably do not account for all of the findings. In addition, observed parent–child discussions around diabetes-specific difficulties were associated with HRQOL, supporting the robustness of the findings across methods. It should be noted that most participating parents were mothers; it is not known whether associations with fathers' reports would differ. In addition, there were insufficient numbers of minority families to allow for analyses by racial/ethnic subgroups, and most children were from two-parent households. Finally, with respect to the observed parent–child discussions, the intraclass correlation for positive interactions was relatively low (.58). This may reflect a limitation of the measure. It may also be more difficult to rate overall warm/positive interactions than it is to clearly identify negative interactions.

The study's strengths include the fact that the data were obtained from four different centers across the country, with a demographically diverse sample. Data were collected from both child and parent reports as well as observational family data, decreasing the possibility of bias in the findings. The present study posits a cross-sectional model of family relationships and HRQOL. Alternative models should be explored in future research, including those assessing other characteristics of the child in interaction with family factors, particularly within a longitudinal framework. Longitudinal assessment may also help determine the extent to which change in parent–child behaviors over time relate to changes in HRQOL, which would more clearly indicate a causal relationship. An examination of the extent to which change in diabetes-specific parenting is associated with a change in generic parenting would also be informative for advancing parenting theory.

The study's findings suggest that clinicians should attend to the level of conflict and negative communication around diabetes-specific tasks among families, and should encourage collaborative parent–child interactions around

diabetes management tasks. Previous research on a behavioral intervention addressing these issues has demonstrated promise in improving diabetes management (Anderson, Brackett, Ho, & Laffel, 1999); however, effects on HRQOL were not assessed. Interventions that teach families strategies for decreasing conflict, decreasing psychologically controlling interactions and improving teamwork may improve the child's quality of life.

Supplementary Data

Supplementary data are available at *JPEPSY* online.

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