Parent Report and Direct Observation of Injection-Related Coping Behaviors in Youth with Type 1 Diabetes

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Objective  This study evaluated insulin injection coping by parental report and video observation in children 3 to <11 years old with diabetes.  Methods  Caregivers of 61 youth with type 1 diabetes completed the Diabetes Injection Distress—Parent Report Form (DID-PRF); a subsample (n = 19; 30%) submitted video recordings of their children’s insulin injections.  Results  The DID-PRF demonstrated acceptable internal consistency and moderately correlated with video recordings. Half of parents (n = 31; 51%) reported their child’s history of insulin injection distress; 30% reportedly experienced distress ≥1 year after diagnosis. Current distress was reported for about half (n = 28) of children. More parent and child coping/distress behaviors was associated with younger child age. Children displayed more injection distress in their first month after diagnosis versus the most recent month.  Conclusions  Diabetes-related injection distress and associated coping behaviors should be further explored; longitudinal data and additional measurement development is warranted.

Key words  children; coping; injections; type 1 diabetes.

Introduction

Researchers have studied injection distress related to a variety of acute and chronic conditions (e.g., immunizations, bone marrow aspirations, growth hormone injections, multiple sclerosis) (Blount, Sturges, & Powers, 1990; Horn & McCarthy, 1999; Turner, Williams, Sloan, & Haselkorn, 2009). Previous research suggests that a child’s ability to cope effectively with injections is clinically important and influences the effectiveness of the intended therapy. Interventions to reduce injection distress and teach skills that promote effective coping often include distraction, parent coaching, and modeling (Uman, Chambers, McGrath, & Kisely, 2008), which have successfully reduced injection distress in children experiencing infrequent procedures (e.g., immunizations) (Dahlquist et al., 2002; Horn & McCarthy, 1999). Youths receiving daily injections might benefit from similar interventions.

Children and adolescents diagnosed with type 1 diabetes face the task of tolerating multiple daily insulin injections. Few studies have specifically investigated behaviors that either contribute to or minimize coping with insulin injections for youth with diabetes (Hanas et al., 2002). Researchers investigated the use of injection aids (i.e., indwelling catheters) to reduce diabetes-related injection pain and anxiety in youth (Hanas, 2004; Hanas & Ludvigsson, 1990; Hanas & Ludvigsson, 1997; Hanas et al., 2002), with notable evidence of reduced pre-injection anxiety and injection pain. Gilbert and colleagues (1982) examined the use of peer modeling for children with diabetes learning to self-inject insulin. More recently,
Moore and colleagues (1995) utilized relaxation, distraction, and coaching techniques to significantly reduce adolescent’s injection time and anticipatory distress. Researchers recommended obtaining data on the prevalence of injection distress in youth to improve generalizability of their findings. Previous research (Gilbert et al., 1982; Moore, Geffken & Royal, 1995; Slifer, DeMore & Cona-Messersmith, 2009) with this patient population confirms the presence of injection distress and suggests the benefit of assessing point prevalence and potential contributing/inhibiting coping behaviors.

Anecdotal evidence and clinical observation suggest that poor coping with insulin injections may occur along a spectrum from transient, mild distress, which is common, to severe, persistent distress that may occur in a rather small segment of the clinical population. Current literature neither offers prevalence data on injection distress in youth with diabetes, nor does it evaluate specific coping behaviors that may contribute to or minimize distress, or provide characterization of demographic variables that may influence a child’s ability to cope with injections. Previous research suggests that younger children cope less effectively during medical procedures (Fradet, McGrath, Kay, Adams, & Luke, 1990; Rudolph, Dennig, & Weisz, 1995) than older children. It is possible that younger children could globally exhibit more coping behaviors (negative as well as positive) in an effort to gain control over a seemingly uncontrollable situation. Parent’s own history of painful medical procedures may also contribute to their ability to assist their child in coping with medical procedures (McCarthy & Kleiber, 2006). Without specific training, parents are likely to use ineffective comforting strategies, which may unintentionally increase a child’s difficulty in coping effectively with the procedure (Blount et al., 1989). Poor coping with the diabetes regimen, including injections, may lead to increased parent–child conflict and negative diabetes-related communication, which can affect adherence and metabolic control (Laffel et al., 2003; Weissberg-Benchell et al., 2009).

Although various parent and child-report scales exist to measure injection distress in youth with acute or chronic conditions (see Dahlquist & Switkin, 2003 for review), most include only one or two items that specifically assess insulin injection distress (Cappelleri et al., 2008) and none assess positive coping techniques. One measure of injection fear in youth with diabetes (Diabetes Fear of Injecting and Self-Testing Questionnaire; D-FISQ) offers parent and youth self-report forms (Simmons et al., 2007), yet it does not assess use of specific coping behaviors that may either intensify or mitigate injection distress. The D-FISQ does not assess youth and parent history of injection distress (McCarthy & Kleiber, 2006), and it measures relatively severe injection fear as opposed to assessing a broad spectrum of coping symptoms.

Observational coding systems (e.g., Child-Adult Medical Procedure Scale-Revised; CAMPIS-R) are empirically well established (Blount et al., 2008) and have been used for rating coping with various medical procedures (Blount et al., 1989; CAMPIS-R; Blount et al., 1997). The CAMPIS-R lists various behaviors that may occur during medical procedures within categories of coping promoting (e.g., count, sing ABC’s,) and distress promoting (e.g., cry or whimper). The authors of the present study developed the Diabetes Injection Distress-Parent Rating Form (DID-PRF) (see Table I), utilizing various coping promoting and distress promoting CAMPIS-R behaviors, as well as other items based upon the authors’ combined diabetes-related clinical and behavioral research experience of over 20 years, to evaluate parent perceptions of (1) their own and their child’s recent behaviors during injections, (2) parental injection distress and child history of injection distress, and (3) frequency/intensity of injection distress behaviors in their child during first and most recent month.

The literature has yet to fully evaluate coping behaviors in youth with type 1 diabetes, which is essential for determining the prevalence of injection distress, assessing health outcomes related to coping behaviors, and providing intervention to those who exhibit significant difficulties coping with injections. The present study obtained initial data on the use of various coping behaviors and frequency/intensity of injection-related distress in 3- to <11-year-old children with type 1 diabetes who do not self-inject their insulin. Injection distress data were compared to results of CAMPIS-R coded videotape observations of insulin injections from a randomly selected subsample of the participants. Data obtained were used to characterize the sample of youth with type 1 diabetes and their parents as well as to evaluate the following hypotheses:

**Hypothesis 1:** The DID-PRF will demonstrate acceptable internal consistency and item-total correlations. The CAMPIS-R will demonstrate acceptable inter-rater agreement. Coping promoting and distress promoting behaviors measured via video observation data (CAMPIS-R) will correlate significantly with corresponding totals on the DID-PRF questionnaire and total score for frequency/intensity of injection distress difficulties in the most recent month.

**Hypothesis 2:** Parents of younger children will report (DID-PRF) more use of coping promoting and distress
promoting strategies in themselves and their children to manage injections compared to parents of older children. Furthermore, videos will demonstrate more parent and child coping promoting and distress promoting strategies (CAMPIS-R) for younger children compared to older children.

**Hypothesis 3:** Parents will report more intense/more frequent injection distress behaviors in their children during the first month after diabetes diagnosis compared to the most recent month.

**Hypothesis 4:** Parents with significant injection distress or children with a history of injection distress, compared to those with no reported distress, will report more use of coping promoting and distress promoting behaviors for parents and children. They will also report more frequent/intense injection distress behaviors in their children during the first month after diagnosis as well as the most recent month, compared to parents or children with no significant injection distress.

**Methods**

**Participants**

Of the 97 families contacted by research coordinators, 25 families were ineligible (17 children were self-injectors) and another 9 families declined to participate. A total of 63 (87%) signed consent documents, 61 of whom completed measures for the study. Participants were children between the ages of 3 and 10 years, 11 months and their caregivers within a southeastern pediatric subspecialty clinic. Patients were eligible if they were diagnosed with type 1 diabetes at least 1 month prior, were on insulin injection regimens (i.e., not on insulin pumps), and did not self-inject for either routine/prescribed doses or supplemental or bolus doses of insulin. Non-self injectors were selected since parents who assist with their child’s injections are present during all injections and therefore able to rate their child’s distress. Self-injectors may also have been less likely to exhibit injection distress. Youth were excluded if they were currently enrolled in any diabetes-related intervention research or if they had documented evidence of significant developmental disabilities.
The sample included 61 caregivers, mostly mothers (n = 57, 94%) of children (32 females; 54%), with an average age of 7.2 years (SD = 2.0) and duration of diabetes 2.1 years (SD = 2.0; range 1 month to 7.7 years). Caregivers averaged 14.2 years of education (SD = 1.9; range = 10–18 years). Families consisted of primarily higher socioeconomic status, 28 of whom reported an annual income ≥$73,000, although 10 families did not report household income. Most children were Non-Hispanic (n = 56, 92%) and Caucasian (n = 48; 79%) or African American (n = 8; 13%) and resided with both biological parents (n = 43; 70%). Two primary caretakers (3.2%) as well as two secondary caretakers (3.2%) were reported to have diabetes.

**Procedures**

Prior to data collection, research procedures were reviewed and approved by the clinic’s institutional review board. A trained research specialist contacted, by letter or telephone, caregivers of potential participants to invite them to participate in the study. Parents and youth participated in the informed consent process with the research assistant and were randomly assigned to either complete questionnaires only (“No-Video”; 69%; n = 42) or to complete questionnaires and obtain videotape recording of three insulin injections (“Video” condition; 31%; n = 19). Parents of the 19 children randomly assigned to the Video condition were asked to make digital video recordings of three insulin injections at home and were provided with a digital video recorder, recoding media and pertinent instructions. Videotape observation data were coded with an empirically validated observational coding system (CAMPIS-R; Blount et al., 1990) in order to assess injection-related behaviors directly in addition to parent report.

If the family was randomly selected for the video condition, the researcher instructed the family to set up the video camera in the home in a location where injections usually occur. Parents were asked to record three insulin injections over a 3- to 5-day period, beginning at the moment when the child was told he/she would be given an injection by the parent. Parents were instructed to stop recording 2 min after the injection was administered. Parents were asked to rate each of these injections (immediately after recording) as “worse than usual,” “usual,” or “better than usual” as compared with the child’s recent behavior related to injections, and were asked to report any known contributing factors (e.g., overly tired, hungry, etc). Once three episodes were captured on video, parents were asked to return the recorder and tapes to the clinic during their scheduled visit to complete study measures. After completing all study procedures, “Video” families were mailed a $40 check.

Families who were not randomized to obtain video recordings were consented and completed study measures in one session with the researcher. After completing study measures, “No Video” families were mailed a $20 check to compensate for their time.

**Measures**

**General Information Form**

Primary caregivers reported child/parent age, gender, race, socioeconomic status, type of household (single caregiver vs. two caregiver, and parent/caretaker history of diabetes), duration of child’s diabetes, and number of prescribed daily injections.

**DID-PRF**

The DID-PRF is partially based upon target behaviors in the CAMPIS-R (Blount et al., 1990). It is the first known parent rating scale that includes specific items related to diabetes injection coping behaviors. It consists of three sections that separately assess current injection coping, promoting/distress promoting behaviors, the child’s lifetime history of injection distress and the child’s injection distress during the first month after diagnosis and the most recent month. Caregivers completed the DID-PRF and rated the frequency (1 = “never” to 3 = “always”) of these behaviors in their child during insulin injections over the past two weeks. Subtotals for parent and child coping and distress promoter behaviors (four subtotals) were calculated by summing the responses in each category for parents and children separately. Child coping promoter behaviors included six items (possible score range = 6–18), child distress promoter behaviors included six items (score range = 6–18), parent coping promoter behaviors included four items (score range = 4–12) and parent distress promoter behaviors included 3 items (score range = 3–9).

Additional items asked the caregiver about their child’s history of difficulty with injections, and current parental injection distress in order to characterize the prevalence of parent’s and children’s injection distress and the time points during the disease course when children’s behaviors occurred. Parents also answered 4 items regarding the frequency (1 = “never” to 3 = “always”) and intensity (1 = mild to 3 = “severe”) of injection distress (e.g., showed problems or distress with taking shots, tried to delay taking regularly prescribed doses) behaviors during the first month after the diagnosis of diabetes as well as during the most recent month. Separate total scores reflecting each child’s aggregate injection distress during the first month after diagnosis and the most recent month were
calculated by multiplying frequency and intensity ratings for each item and then summing the resultant item scores.

CAMPIS-R
Researchers utilized the CAMPIS-R to code each videotape observation of insulin injections. Of 19 families randomized to the video condition, all submitted at least one video. A total of 18 submitted two videos and 15 submitted three videos. Videos averaged 52.37 s in length (range = 10 s to 9 min). The CAMPIS-R (Blount et al., 1990) measures children’s cooperation and procedure-related distress as well as parent responses during various medical procedures and demonstrates acceptable concurrent validity to other measures of procedural distress, including the Observational Scale of Behavioral Distress (OSBD; Jay, Ozolins, Elliott, & Caldwell, 1983) and the Behavioral Approach and Avoidance Scale (BAADS; Hubert, Jay, Soltoun, & Hayes, 1988). Target behaviors for the current study were drawn from the following CAMPIS-R categories: adult coping promoting (e.g., humor directed to child), adult distress promoting (e.g., criticism), child coping promoting (e.g., nonprocedural talk) and child distress (e.g., crying). Ratings were obtained for 15-s intervals for each category. Three raters (a doctoral, masters, and bachelor level) were trained to a criterion of ≥85% agreement with consensus coding of several videotaped insulin injections. The number of coded behaviors within a given category was divided by the number of total possible codeable behaviors in order to establish a ratio accounting for video length.

Statistical Analysis
Descriptive statistics and measures of central tendency were obtained for demographic variables (e.g., age, race/ethnicity) as well as caregiver reports of youth injection related distress. All data were checked for homogeneity of variance and normality of distribution prior to inferential statistical analysis. Alpha coefficients were obtained to assess the internal consistency and reliability of the DID-PRF. Analyses of variance (ANOVAs) were conducted to assess the relationship between discrete demographic variables (e.g., gender, ethnicity, race) and injection distress (DID-PRF). Pearson correlation coefficients were obtained to assess the relationship between continuous demographic variables (e.g., child age, duration of diabetes) and injection distress (DID-PRF). Pearson correlations were conducted to assess the relationship between video observation of insulin injections (CAMPIS-R) and parent report of coping related to injections (DID-PRF). Separate multivariate ANOVAs (MANOVAs) were conducted to assess the effects of age (younger vs. older children based on median age split) on: (1) video observations of parent and child behaviors (CAMPIS-R) and (2) parent report of parent and child coping promoting and distress promoting behaviors (DID-PRF) (see Table II). Lastly, t-tests were conducted to assess the difference in injection distress behaviors during the first month after diabetes diagnosis compared to the most recent month.

Results
Psychometric properties of the DID-PRF and CAMPIS-R, and correlation between the two measures
Psychometric Qualities of the DID-PRF and CAMPIS-R
Hypothesis 1 was partially confirmed, as the DID-PRF internal consistency was acceptable for child coping promoting behaviors (α = .65; M inter-item correlation = .32). Reliability was stronger for child distress promoting (α = .83; M inter-item correlation = .44), parent coping promoting (α = .80; M inter-item correlation = .51), and acceptable for parent distress promoting (α = .67; M inter-item correlation = .40). Reliability was good for frequency/intensity of injection distress during the first month since diabetes diagnosis (α = .89; M inter-item correlation = .74) as well as frequency/intensity of injection distress during most recent month (α = .88; M inter-item correlation = .80). One item (use a blower) was automatically deleted due to lack of variance, and another (answer questions) was selectively deleted due to weak correlation to other items.

Reliability of the CAMPIS-R video ratings was evaluated by intraclass correlations of videos that were independently scored by three raters according to CAMPIS-R guidelines. Analyses demonstrated satisfactory inter-rater agreement within each rating category across all videos (intraclass correlation coefficient range = .73 to .98).

Relationship Between Video Observation (CAMPIS-R) and DID-PRF Ratings
As expected, CAMPIS-R video observation behavioral categories correlated well with the corresponding DID-PRF coping behaviors for parent coping promoters (r = .60, p = .009), parent distress promoters (r = .56, p = .015), and child distress promoters (r = .70, p = .001), but not with CAMPIS-R video observation ratings of child coping promoters (r = .35, p = .183). No significant relationship was revealed between CAMPIS-R video ratings and frequency/intensity of injection distress difficulties in the most recent month (r ranges .16 to .32).
similarly, parents of younger children were reported to use significantly more distress promoter behaviors than parents of older children (t = 2.51, p = .015, d = .65) and a trend toward use of more distress promoter behaviors with boys (t = 1.71; p = .092, d = .45) than girls.
Age-Based Differences in CAMPIS-R Ratings
CAMPIS-R video observation ratings revealed that younger children exhibited more distress promoting behaviors ($F(1,19) = 10.00, p = .006, d = .64$) than did older children. However, child age was not associated with video-coded frequencies of child coping promoting, parent coping promoting or parent distress promoting behaviors.

Frequency/intensity of injection distress during the first month after diagnosis versus the most recent month
Hypothesis 3 was confirmed, as frequency/intensity of injection distress was significantly higher for the initial month after diagnosis ($M = 17.53; SD = 12.16$) than the past month ($M = 7.14; SD = 6.27$) ($t = 5.27, p = .000, d = 1.78$).

Association of parent/child injection distress with coping and injection distress behaviors
Hypothesis 4 was generally confirmed, in that parents with a personal history of injection-related distress reported engaging in more coping promoting behaviors ($F(1,58) = 4.07, p = .049, d = .65$) and more distress promoting behaviors ($F(1,58) = 13.41, p = .001, d = .93$) toward their children, compared to parents with no reported injection distress. Parents with a history of injection distress also reported that their children engaged in more distress promoting behaviors ($F(1,58) = 4.42, p = .040, d = .60$) than parents with no history of injection distress. No significant associations were found between parent history of injection distress and their children’s use of coping promoting behaviors. However, parents with injection distress reported that their children exhibited significantly more injection distress behaviors during the most recent month ($F(1,36) = 9.75, p = .004, d = .98$) compared to parents with no injection distress.

Children with a reported history of injection distress were also reported to engage in more distress promoting behaviors ($F(1,58) = 11.45, p = .001, d = .89$) and their parents engaged in more coping promoting behaviors ($F(1,58) = 6.70, p = .012, d = .68$) and distress promoting behaviors ($F(1,58) = 10.05, p = .002, d = .84$) compared to reports of children with no history of injection distress behaviors. Parent injection distress was unrelated to the child’s injection distress behaviors during the first month after diabetes diagnosis. However, children with a history of injection distress exhibited significantly more insulin injection distress behaviors during the first month after diagnosis ($F(1,36) = 13.62, p = .001, d = 1.39$) and most recent month ($F(1,36) = 4.86, p = .034, d = .86$) compared to children with no history of injection distress.

Characterization of parent and child behaviors during injections
About half of parents reported that their child currently does not engage in distress promoting behaviors ($n = 33, 54\%$), with many of the remaining children engaging in low levels of such behaviors ($M = 9.18, SD = 1.87$; range 6–18). Most parents reported no engagement in distress promoting behaviors toward their child ($n = 41, 67\%$), with the remainder engaging in distress promoting behaviors somewhat infrequently ($M = 4.65, SD = .99$; range 3–9).

A total of 28 (46\%) parents reported that their children do not engage in coping promoter behaviors, with the majority using such behaviors somewhat frequently ($M = 8.03, SD = 1.33$; range 6–18). A total of 20 parents (33\%) reported no engagement in coping promoter behaviors, with the remainder reporting occasional use ($M = 6.75, SD = 1.77$; range 4–12).

Over half of respondents ($n = 31; 51\%$) indicated that their child experienced significant injection distress at some point since diagnosis, persisting on average for 8.37 months ($SD = 9.60$; range 1 day to 36 months). Many youth experienced injection distress for a year or more following diabetes diagnosis (30\%), with greater diabetes duration associated with longer duration of injection distress ($r = .39, p = .042$). A total of 10 parents (16\%) reported personally having injection distress, mostly to a moderate degree ($n = 8$).

Characterization of Videotape Observation of Injection Distress
Comparison of “video” vs. “no video” participants revealed no systematic differences on any demographic variables, length of diabetes diagnosis, or responses to DID-PRF items. Videotapes generally demonstrated little observable injection-related distress (parent distress promoters $M = 3.51, SD = 3.68$; youth distress promoters $M = 4.12, SD = 4.01$). However, one video in particular demonstrated significant distress, evidenced by approximately 10 min of significant child distress-promoting behaviors. Videos also demonstrated a variety of appropriate coping promoting behaviors, such as distraction and counting.

For each videotaped insulin injection, parents were asked to compare their child’s behavior to other recent injections. Of the 56 videos submitted by families, 38 (68\%) were reported to be “usual,” compared to recent injections, while 11 (20\%) were reported to be “worse than usual” and 7 (12\%) were reported to be “better than usual.”
Discussion

Consistent with Hypothesis 1, the present study demonstrated that coping and distress related to parent-administered injections for children with type 1 diabetes can be measured with acceptable reliability and validity both by a parent-report questionnaire (DID-PRF) and by coding of video recordings of actual injections (CAMPIS-R), with several significant correlations between the two measures, as expected. Correlations with the DID-PRF child coping promoting behaviors subscale were the exception. The CAMPIS-R revealed more child distress promoters for younger children but there was no relation between child age and parent distress promoters. Supporting Hypotheses 2 and 3, more injection distress (DID-PRF) was reported among younger rather than older children and among children during the first month following the diagnosis of diabetes compared with the most recent month. Finally, Hypothesis 4 was supported since parents with injection distress or children with a history of injection distress reported more parent and child distress promoting behaviors, parent coping promoting behaviors, and more child insulin injection distress immediately after diabetes diagnosis and most recently compared to parents without injection distress and children without a history of injection distress.

Half of the current participants reported a history of diabetes-related injection distress in their children, compared to existing data suggesting a prevalence of 27% (Simmons et al., 2007). Results from both the DID-PRF and CAMPIS-R suggest that severe injection distress is uncommon, and notably, many children demonstrate significant resiliency and lack of emotional distress (Whittemore, Urban, Tamborlane, & Grey, 2003) despite difficulty related to injections (Kovacs, Brent, Steinberg, Paulauskas, & Reid, 1986).

Overall, results of the study suggest that a substantial percentage of children with type 1 diabetes do experience transient and/or less severe distress related to insulin injections. The findings suggest that injection distress may be a clinical phenomenon that exists along a spectrum of severity and persistence. This research has begun to specify variables that may determine a given child’s status along that spectrum, such as greater use of coping strategies or difficulty coping with injections, parents’ current or children’s history of injection-related distress, younger child age, and more recent diabetes diagnosis. Unexpectedly, parents reported using more coping strategies with boys, which contradicts some previous research indicating lack of gender differences in coping styles (Boland & Grey, 1996; Brown, Okeefe, Sanders, & Baker, 1986) while other data suggest that boys and girls do cope differently (Kankkunen, Vehvilainen-Julkunen, Pietila, & Halonen, 2003; Rudolph et al., 1993). Future studies should explore gender differences in coping specifically related to insulin injections.

Insulin injection distress may persist in some youth with diabetes, translating to a lack of adherence, depression, anxiety, chronic fatigue, and diabetes-related emotional distress (Mollema, Snoek, Ader, Heine, & van der Ploeg, 2001) along with poor glycemic control (Metsch, Tilill, Koobberling, & Sartory, 1995; Berlin et al., 1997). Failure of injection-related distress to remit in childhood may increase the risk of long-term complications (Zambanini & Feher, 1997) and is evidenced by various adult measures of injection fears or anxiety (Cutshall & Watson, 2004; Page, Bennett, Carter, Smith & Woodmore, 1997; Petrak et al., 2007), and behavioral interventions to reduce symptoms (Oliver & Page, 2003). Identifying and treating injection-related distress in childhood may prevent associated health risks in adulthood.

Study limitations must be acknowledged, including the small sample size of primarily Caucasian intact families. The cross-sectional nature of the present study precludes analysis of the injection distress trajectory or coping across time. Current results are subjected to recall bias, as parents completed the measure retrospectively rather than immediately after injections. Such bias, as well as inherent differences between subjective parent report and objective videotape coding may have contributed to the lack of relationship between parent report of intensity/frequency of injection distress (DID-PRF) and the CAMPIS-R. Video data were limited by a small sample size (n = 19) and low frequency of coping promoting as well as distress promoting behaviors exhibited on the videos, which may have contributed to the lack of association between child coping promoting behaviors as measured by the CAMPIS-R and the DID-PRF. Additional research with a larger sample size of video observation data is warranted to clarify the relationship between the two measures. Age-related differences between the CAMPIS-R and DID-PRF behavioral codes highlighted the importance of using videotape observation and parent report for behaviors related to insulin injections, and validated the feasibility and utility of observational assessment in investigations of injection distress. While behavioral observations of injection procedures offer an objective assessment, parent report is also a useful tool for assessing youth coping from the parent’s perspective. Additional measurement development is recommended in order to improve the psychometric quality and clinical utility of the DID-PRF. Refinement of items...
specifically related to younger children and actual practices of children who cope well with injections is recommended.

Future research may determine when injection distress becomes a clinically significant impediment to diabetes care, psychological adjustment to diabetes and quality of life, potentially by assessment of moderating child (e.g., temperament, anxiety) and parent (e.g., parenting style) (McCarthy & Kleiber, 2006) factors that could contribute to or inhibit development of injection-related distress. Such research could contribute to the clinical application of data on coping with insulin injections. Since children and parents may benefit from training on how to improve coping with painful injection-related procedures for children (Blount et al., 1989; Cohen, Bernard, Greco, & McClellan, 2002) and 16% of current study parents self-endorsed injection-related distress, it is feasible that an empirically based, brief clinical assessment and coaching for coping with insulin injections may be beneficial for families of children with diabetes.

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References


Hanas, R., & Ludvigson, J. (1990). Side effects and indwelling times of subcutaneous catheters for


Weissberg-Benchell, J., Nansel, T., Holmbeck, G., Chen, R., Anderson, B., Wysocki, T., & Laffel, L.
