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Intrinsic Motivation in Ethnic Minority Youth with Type 1 Diabetes

Alan M Delamater, PhD, **Amber L Daigre, PhD**, **Ashley N Marchante, MS**, **Elizabeth R Pulgarón, PhD**, **Anna Maria Patiño-Fernandez, PhD**, **Janine Sanchez, MD**

University of Miami, Miller School of Medicine Miami, FL, USA

Abstract

Increasing intrinsic motivation (IM) may be an effective way to improve regimen adherence and glycemic control in youth with type 1 diabetes (T1D). This preliminary study evaluated the reliability and validity of a new measure of intrinsic motivation for diabetes management for ethnic minority youth with T1D. The 12-item Intrinsic Motivation Inventory for Diabetes Management (IMI-DM) was developed to assess perceptions of confidence in and the importance of engaging in self-care behaviors for diabetes management. Participants included 51 11–16 year-old minority adolescents (M age = 13.5 years) with T1D and their parents. The IMI-DM demonstrated excellent internal consistency (α=.92). Higher IM was associated with better diabetes self-management behaviors and glycemic control, better youth self-concept, less depression and family conflict, and greater youth responsibilities for diabetes management. These findings provide preliminary support for the reliability and validity of a new diabetes-specific IM measure for youth with T1D, and identified some key individual and family factors that may be important to consider in interventions to improve regimen adherence and glycemic control in minority youth with T1D.

Keywords

type 1 diabetes; intrinsic motivation; self-determination theory; adolescents; ethnic minority youth; regimen adherence

According to Self-Determination Theory (SDT), motivation is a powerful mechanism for understanding what drives human behavior (Ryan & Deci, 2000). A distinction is made in SDT between intrinsic motivation (IM) and extrinsic motivation. IM refers to an individual's self-motivation to succeed in an activity that will result in personal satisfaction, while external motivation refers to the drive to succeed due to external pressures (Deci, Koestner, & Ryan, 1999). Although individuals may be motivated both intrinsically and extrinsically, SDT focuses on IM as a way to achieve the best quality performance in various aspects of life.

Corresponding Author: Alan M. Delamater, PhD., Department of Pediatrics, Division of Clinical Psychology, P.O. Box 016820 (D-820), University of Miami Miller School of Medicine, Miami, FL 33101. Telephone: 305-243-6857. Fax: 305-243-4512. adelamater@med.miami.edu.

SDT has been adapted for use in different fields to understand how to increase IM for targeted behaviors. For example, IM has been shown to predict physical activity in youth, providing support for the importance of this construct in understanding health behaviors in youth (Lawman, Wilson, Van Horn, Resnicow, & Kitzman-Ulrich, 2011). In the healthcare context, research indicates that regimen adherence and glycemic control typically declines for youth with type 1 diabetes mellitus (T1D) during adolescence (Helgeson, Simierio, Escobar, & Becker, 2009; Johnson et al., 1992; Rausch et al., 2012). This is especially true among ethnic minority youth of Hispanic or African-American background, who have worse glycemic control than non-Hispanic white youths (Delamater et al., 1999; Petitti et al., 2009).

Intrinsic motivation is a key construct derived from SDT that relates to management of chronic diseases such as diabetes. Two aspects of IM that are relevant to self-care behaviors in chronic disease management are perceptions that individuals have of the importance of those behaviors and the confidence they have in performing them. Motivational interviewing (MI) interventions focus on these beliefs patients have about the importance of specific regimen behaviors and their confidence or self-efficacy in performing them. During MI, efforts to increase IM include contrasting beliefs about the importance of various health behaviors with core values in order to resolve ambivalence about behavior change. Discussions about confidence regarding health behaviors may lead to problem-solving strategies to decrease barriers and increase self-care behaviors.

Researchers and clinicians have focused on IM in order to improve regimen adherence among youth with T1D. For example, when applied to the pediatric population, MI has been used to increase youths' motivation to improve regimen adherence and achieve greater independence with disease management (Erickson, Gerstle, & Feldstein, 2005; Suarez & Mullins, 2008). Early pilot studies showed the potential of MI to improve glycemic control in youth with T1D (Channon, Smith, & Gregory, 2003; Viner et al., 2003). In a larger randomized clinical trial with adolescents with T1D, those receiving MI had improved glycemic control, and reported better quality of life and beliefs of the importance of diabetes management (Channon et al., 2007). A recent uncontrolled pilot study showed that an intervention to increase motivation in poorly controlled adolescents with T1D improved frequency of glucose monitoring and glycemic control (Stanger et al., 2013), supporting the concept that IM is integral to good diabetes management.

Although IM is integral in MI to improve self-care behaviors, there are few measures to assess IM as it relates to chronic illness, particularly among youth with T1D. An SDT-based measure that was developed for adults, the Treatment Self-Regulation Questionnaire, has been shown to be reliable and valid across various settings and health behaviors such as tobacco, diet, and exercise (Levesque et al., 2007), as well as in predicting medication-taking (Williams, Rodin, Ryan, Grolnick, & Deci, 1998). In studies with adult patients with diabetes using this measure, it has been demonstrated that autonomy motivation (or IM) was enhanced by autonomy support by health care providers, and increased IM led to increased perceived competence at self-management and improved self-care behaviors and glycemic control (Williams, Freedman, & Deci, 1998; Williams, McGregor, Zeldman, Freedman, & Deci, 2004; Williams et al., 2009).

Few studies have been conducted on IM as it applies to management of T1D in youth. One report used a general measure of IM for health promotion with a sample of youth with T1D (Greening, Stoppelbein, Moll, Palardy, & Hocking, 2004). In this study, greater IM was associated with better self-reported regimen adherence, but worse glycemic control. Another study examined SDT-based predictors of dietary self-care in youth with T1D and found, as in the adult studies, perceptions of greater IM and self-efficacy were associated with greater autonomy support from health care providers, and led to better dietary self-care (Austin, Senecal, Guay, & Nowen, 2011). However, the measure of IM in that study was developed only for dietary self-care. It is therefore important to develop a measure that can reliably measure IM to engage in diabetes self-management tasks.

The Intrinsic Motivation Inventory (IMI) is a multi-dimensional self-report measure based on SDT, created to assess IM to carry out particular activities during controlled experiments (Ryan, 1982). In adults, the IMI has been shown to be an effective tool to measure IM within certain contexts. For example, a longitudinal study confirmed that the IMI adapted for IM to perform physical activity had good internal consistency in healthy college students (Buckworth, Lee, Regan, Schneider, & DiClemente, 2007). Additionally, in a study assessing mediators of weight loss in women with an adaptation of the IMI for physical activity, greater initial IM was associated with long-term weight loss success (Teixeira et al., 2010).

Research with youth with T1D, for whom long-term regimen adherence is crucial, would benefit from a diabetes-specific measure of IM. We therefore developed the Intrinsic Motivation Inventory for Diabetes Management (IMI-DM), modeled after the IMI, to assess both feelings of confidence in and the importance of engaging in self-care behaviors for management of T1D. This questionnaire is unique in that it targets youths' perceptions about diabetes self-management behaviors. The use of this measure with ethnic minority youth may help understand factors related to their increased risk for poor glycemic control (Williams et al., 2004).

The main objectives of the present study were: 1) to develop a clinically useful measure of IM for diabetes management for youth with T1D, 2) determine its reliability, 3) assess the criterion-related validity of the measure by determining the relationship of IM to regimen adherence and glycemic control, and 4) identify psychosocial variables associated with intrinsic motivation. This is a preliminary study to examine the psychometric properties of this new measure as it applies to diabetes management in ethnic minority youth. It was hypothesized that youth reporting higher levels of diabetes-related IM would exhibit better regimen adherence and glycemic control than those reporting lower IM, thus supporting the criterion-related and predictive validity of the IMI-DM. In addition, it was expected that higher IM in youths would be associated with better psychosocial functioning (i.e., greater self-worth, less depression, less diabetes-related family conflict, and greater youth responsibility for diabetes self-management).

Method

Participants

Participants included 51 adolescents with T1D, 30 of whom were enrolled in a pilot intervention study to improve self-management in minority youth; 21 additional youth were enrolled after the 30 participants were recruited for the intervention study, and these 21 youth participated in only a one-time assessment. Inclusion criteria were: age 11–16 years; diagnosed with T1D for at least one year; ethnic minority status (i.e., Hispanic or black); and presence of a parent or guardian who could provide informed consent. Over the recruitment period, there were 107 potentially eligible youth. Of these, 14 were ineligible due to exclusion criteria (significant developmental disability or major psychiatric illness, or other serious chronic illness such as cystic fibrosis), 8 were ineligible due to participation in another intervention study, and 34 families declined due to lack of interest, time, living too far away, or transportation difficulties (including four who withdrew after providing initial consent but did not complete the baseline assessment). Thus, the participation rate among eligible patients was 60%. During recruitment, all study procedures were explained and questions answered. Youth completed written assent and parents completed written informed consent according to a protocol approved by the local Institutional Review Board.

The current study utilized baseline data for 30 participants in the intervention study and the 21 other youth recruited for the current study. As shown in Table 1, the mean age of these 51 youths was 13.5 $\pm$ 1.3 years; mean diabetes duration was 6.0 $\pm$ 3.9 years; mean HbA1c was 8.79 $\pm$ 1.69% (73 mmol/mol). There were 25 boys (49%) and 26 girls in the study sample; 48 youth were Hispanic (94.1%) and three were Black (5.9%). Thirty-eight percent of children reported primarily speaking English in the home; 42% reported Spanish, and 19% reported both languages. Fifty-seven percent of parents within the sample reported being married and 43% reported not being married. Mean number of years of education for mothers and fathers was 13.1 $\pm$ 2.2 years and 13.3 $\pm$ 2.6 years, respectively. Participants were compared with the 34 eligible non-participants with regard to age, gender, ethnicity, and HbA1c, and there were no statistically significant differences: mean age of non-participants was 13.5 years, 41.2% were boys, 14.7% were Black, and mean HbA1c was 8.43 $\pm$ 1.79% (69 mmol/mol).

Procedures

Adolescents were recruited during their outpatient clinic visit. All study procedures occurred at the clinic or were scheduled at another time soon after. To establish the criterion-related validity of the IMI-DM, measures of regimen adherence and glycemic control were obtained at the clinic visit; a measure of glycemic control was also obtained six months later for the 30 participants in the prospective pilot intervention study to examine predictive validity. In addition, the IMI-DM was re-administered to these 30 youth six months after the first assessment to examine temporal stability of the measure. To identify correlates of IM, questionnaires (in English and Spanish) were used to assess several psychosocial variables, as described below. All youth in the study sample completed measures in English, while 51% of parent measures were administered the measures in English. Questionnaires were

translated to Spanish by certified translators and then back-translated; differences were resolved by consensus agreement.

Measures

Intrinsic Motivation Inventory – Diabetes Management (IMI-DM).—The IMI-DM was modeled after the original IMI (Ryan, 1982) which measures domains of intrinsic motivation, including importance and confidence. The IMI-DM employed in this study consisted of 12 items, each scored on a Likert scale ranging from Not True at All (1) to Very True (7). The IMI-DM used the original item stems from the IMI (e.g., I am satisfied with my ability to…; It is important for me to...; I try hard to…), and then each stem concluded with a phrase about managing diabetes, self-care tasks, or blood glucose control. Thus, the only similarity between the IMI and the IMI-DM is in terms of the item stems and the 7-point Likert scale.

The IMI-DM consists of two subscales, each with six items: Confidence, assessing how sure the adolescent is that they can complete the necessary tasks of diabetes management; and Importance, measuring the importance the adolescent attributes to diabetes management behaviors. This measure was administered to the child participant only. To score the IMI-DM, the items on the Confidence Scale and Importance scales were summed and divided by six (the number of items in each subscale) to calculate subscale scores (range 1–7); a mean total scale score was also calculated by summing and dividing by 12 (range 1–7). Table 2 lists all the items in the IMI-DM. The items were developed by the investigators to have reasonable clarity, face and content validity. The internal consistency of the IMI-DM total and subscale scores are reported in the Results section below.

Diabetes Self-Management Profile (DSMP).—The DSMP is a reliable and valid structured interview that assesses diabetes management over the previous three months (Harris et al., 2000). The measure includes 23 questions divided across five domains of self-care: exercise, diet, management of hypoglycemia, blood glucose testing, and insulin administration and dose adjustment. In the current study, the DSMP was administered separately to youth participants and their parents. Higher scores on this measure indicate better diabetes self-management. Because the total scores for the DSMP from youth and parents in the study sample were correlated at .56 ($p<.001$), their scores were combined and means obtained for the total DSMP and DSMP subscales. In the current study, the combined DSMP total score demonstrated good internal consistency in the study sample ($\alpha=.80$).

Self-Worth.—Youths' self-worth was measured using the general self-worth subscale of the Perceived Competence Scale for Children (Harter, 1982). The original Perceived Competence Scale for Children includes four scales: Cognitive Competence, Social Competence, Physical Competence, and General Self-Worth. The latter of these scales was administered to the child participant in the current study to measure youths' general self-worth, over and above competency judgments in the other areas of functioning. The seven-item subscale demonstrated acceptable internal consistency in the study sample ($\alpha=.73$).

Depression.—The Beck Depression Inventory (BDI-II) is one of the most commonly used measures of depression symptoms (Beck, Steer, & Brown, 1996). The 21-item measure reflects DSM-IV diagnostic criteria and requires the individual to report on symptoms experienced in the past two weeks. Responses for symptom severity range from 0 to 3 and items are then summed to create a total score. This measure was administered to youth in the sample. The BDI-II has very good psychometric properties and has been validated with adolescent samples (Steer, Kumar, Ranieri, & Beck, 1998). In the current study, the BDI-II had excellent internal consistency (α=.92).

Diabetes Family Responsibility Questionnaire (DFRQ).—The DFRQ measures the extent to which diabetes management tasks are primarily the responsibility of parents, youths, or shared between them (Anderson, Auslander, Jung, Miller, & Santiago, 1990). The DFRQ contains 17 items across three subscales: General Health Maintenance, Regimen Tasks, and Social Presentation with responses indicating who in the family accepts responsibility for the specific task (e.g., parent, child, or both). The present study utilized only the total scale score, obtained by summing the score for each item, with higher scores indicating greater youth responsibility for diabetes management tasks. The measure was completed by both parent and child participants. Internal consistency for the total scale score in the current study sample was very good (α=.85 for both youth and parents).

Diabetes Family Conflict Scale (DFCS).—The DFCS is a validated 19-item measure of family conflict around specific diabetes management responsibilities such as blood glucose monitoring, dietary behaviors, and administering insulin injections (Hood, Butler, Anderson, & Laffel, 2007). Responses are made on a 5-point Likert scale. This measure was administered to both parent and child participants. In the current study sample, very good internal consistency was obtained for both youth (α=.85) and parent (α=.81) report for the total scale score.

Glycemic Control.—Glycemic control was assessed using glycosylated hemoglobin A1c (HbA1c) obtained at the time of the clinic visit and also six months later (for the 30 youth participating in the prospective study), and retrieved from the medical chart. The normal range for the HbA1c assay used in the current study was 4–6.1% (20–43 mmol/mol). HbA1c values were available for 100% of the study sample at baseline and all 30 participants in the prospective study at follow-up.

Results

Psychometric Properties of the IMI-DM

Reliability.—Internal consistencies (Cronbach's α) were .92 for the total score, .90 for the confidence subscale, and .80 for the importance subscale. Mean scores for the total scale score and subscale scores are shown in Table 1. The correlation between the Confidence and Importance subscales at baseline was .71 ($p<.001$). For the 30 participants in the pilot intervention study, there was no change in IM after six months; therefore, all participants were considered together in the analysis of temporal stability. The correlations between the

IMI-DM total, Confidence, and Importance scales over six months were .63, .67, and .55 (all p's<.001), respectively, indicating reasonable stability over that period of time.

Validity.—Criterion-related validity was evaluated by conducting Pearson product-moment correlations between the IMI-DM total score and subscale scores with the total DSMP score and each DSMP composite score and with HbA1c. As shown in Table 3, there were significant associations observed between the IMI-DM total and DSMP total scores (r=.60, p<.001), as well as HbA1c (r=−.46, p<.01), indicating higher IM was associated with increased levels of diabetes self-management behaviors and lower HbA1c. The IMI-DM total score was also associated with DSMP eating (r=.60, p<.001), exercise (r=.35, p<.01), hypoglycemia management (r=.41, p<.01), and blood glucose monitoring (r=.32, p<.01), such that higher IM was associated with better regimen adherence in each area. The IMI-DM total score at baseline also predicted better diabetes self-management behaviors (DSMP total score) (r=.52, p<.01) and HbA1c (r=−.39, p<.03) six months later.

The IMI-DM Confidence subscale was associated with the DSMP total score (r=.51, p<.001) and HbA1c (r=−.53, p<.01), indicating greater confidence was related with better regimen adherence and glycemic control. In addition, IMI-DM Confidence was associated with DSMP eating (r=.58, p<.001), exercise (r=.30, p<.01), and hypoglycemia management (r=.33, p<.01). The IMI-DM Importance subscale was similarly associated with DSMP total (r=.62, p<.001) and A1C (r=−.29, p<.05), with greater importance related with better regimen adherence and glycemic control. IMI-DM Importance was also related to DSMP eating (r=.52, p<.001), exercise (r=.37, p<.01), BG monitoring (r=.38, p<.01), hypoglycemia management (r=.43, p<.01), and insulin use (r=.28, p<.05).

Because youth regimen adherence may be affected by parental involvement, additional analyses were conducted to control for this potential confound in the relationship between IM and DSMP scores. Regressions were conducted in which both parent and youth DFRQ scores were controlled for in the analyses of the relationship between IMI-DM and DSMP scores. Results revealed that after controlling for parental involvement, the relationships between IMI-DM total scores, IMI-DM Importance, and IMI-DM Confidence with DSMP total scores remained significant (p's<.01).

Correlates of Intrinsic Motivation

Correlations were conducted between IMI-DM scores and potential demographic and psychosocial predictors of IM in youth. No significant differences were seen between boys and girls on IM. There were also no significant relationships observed between IM and other demographic variables (i.e., youth age and parental education) and diabetes duration. However, relationships were observed between IMI-DM Total score and youth self-worth (r=.40, p<.01), depression (r=.−37, p<.01), youth-reported family conflict (r=.−.40, p<.01), and parent-reported diabetes family responsibility (r=.30, p<.05). These associations revealed higher diabetes-related IM was related to better self-worth, less depression, less diabetes-related family conflict, and greater youth responsibility for diabetes management. A multiple regression was conducted with responsibilities for diabetes management and diabetes conflict in the first step, and self-worth and depression in the second step. Results

indicated the model was significant (F=4.28, $p<.005$), with 28% of the variance in IMI-DM accounted for; however, none of the psychosocial variables accounted for unique variance. Correlations were also conducted to assess subscale-specific relationships with IM, revealing a similar pattern of significant relationships as those with IMI-DM total score, as shown in Table 3.

Discussion

Main Findings

The purpose of this study was to develop and evaluate the psychometric properties of a new theory-based measure of IM for T1D management for youths (Ryan & Deci, 2000; Deci et al., 1999). The IMI-DM proved to have very good internal consistency, reasonable stability over time, and very good criterion-related validity. Higher levels of IM were associated with greater levels of diabetes self-management behaviors and better glycemic control, both concurrently and prospectively. Our analyses controlled for the potential confound of parental involvement, thereby indicating that IM is an important independent predictor of regimen-related health behaviors. This finding supports previous research indicating IM for general health behaviors predicted better regimen adherence in children with T1D (Greening et al., 2004). The current study, which used a diabetes-specific measure of IM, demonstrated relationships with both regimen adherence and glycemic control, consistent with predictions. It should be noted that this study did not demonstrate test-re-test reliability, but rather demonstrated relative stability over a six-month period of time. We combined the intervention and comparison groups in our analysis for this purpose because the IMI-DM measure was not different between the two groups over time. Further research is needed to demonstrate the short-term test-re-test reliability of the IMI-DM measure.

Psychosocial functioning was evaluated as a correlate of IM to obtain a better understanding of this construct in minority youth with T1D. As expected, youth who had higher levels of IM had higher self-worth, lower depression, lower diabetes-related family conflict, and greater responsibility for self-management. The use of the IMI-DM with a sample of ethnic minority youth with T1D in the current study provides insight into some psychological and psychosocial factors associated with diabetes management in a patient population at high risk for metabolic control problems (Petitti et al., 2009).

This is a preliminary investigation of an instrument designed to measure a highly important construct in behavior change that has not been previously addressed in pediatric diabetes research. Although MI has been successfully applied with adolescents with T1D (Channon et al., 2007), few studies in youth have specifically focused on measurement of the construct of IM itself for diabetes management. A related construct, self-efficacy, has been studied in pediatric diabetes and a reliable and valid questionnaire measuring diabetes-specific self-efficacy has been used (Grossman, Brink, & Hauser, 1987). While the confidence subscale of the IMI-DM is similar in concept to the diabetes-specific self-efficacy measure, it is important to note that the IMI-DM goes beyond measuring self-efficacy by also measuring importance, an important part of the IM construct from SDT (Ryan & Deci, 2000). Another measure, the Personal Models of Diabetes Scale, originally developed for use with adults (Hampson, Glasgow, & Foster, 1995), assesses beliefs about the importance of diabetes

management and was used in a study of adolescents with T1D (Channon et al., 2007). The new measure of IMI-DM assesses both confidence and importance in one brief questionnaire that has good clinical utility. It would be of interest in further research to examine a parent-report version of the IMI-DM.

Limitations

There are some limitations to the current study, including the fact that this measure was tested with a relatively small and mostly Hispanic sample of youth in the age range of 11–16 years who were recruited to participate in a prospective intervention study—by study design, white, non-Hispanic youth were not approached for participation. There may be some concerns about potential sample bias, in that those families declining participation in the intervention study had youth who had somewhat better glycemic control (8.43% vs. 8.79%, or 69 vs. 73 mmol/mol) and were relatively more likely to be black (13.5% vs. 5.9%); however, there were no statistically significant differences between participants and non-participants, their mean age was exactly the same (13.5 years), and although participation of boys was slightly less than girls (41.2% vs. 49%), there were no gender differences in IM in the study sample. Thus, it is unlikely that the study sample was biased. Nevertheless, future studies will need to evaluate the new measure in larger and more heterogeneous samples to ensure its psychometric properties and generalizability. Another limitation in the current study was the use of the BDI-II with a study sample that included youth that were as young of 11 years of age, since the measure has been validated with youth 12 years of age and older.

Implications for Clinical Practice

Adolescence is a challenging period of development consisting of balancing the desire for independence with the need for parental support. In pediatric diabetes, this patient population is at high risk for regimen adherence problems and can be challenging to engage in behavior change around disease management. When young adolescents assume more responsibility for diabetes self-management without adequate parental monitoring, the results are generally suboptimal (Wysocki et al., 1996). The use of the IMI-DM can provide an evaluation of how motivated an adolescent is to engage in appropriate self-care by identifying how confident they are in their ability to manage diabetes and the importance they attribute to this issue. This information can enable clinicians to make decisions regarding which treatments and approaches are most likely to be effective with a given patient.

The IMI-DM could be helpful as a screening measure to identify youth who have low IM and are in need of additional interventions related to how they view the importance of diabetes self-management and/or by building confidence in their ability to perform these behaviors. Continued administrations can provide useful feedback regarding the progress patients are making with increasing motivation for change. Given the relationships between IM and self-worth, depression, and family conflict, it may be important to address these issues in order to facilitate motivation for self-care.

Conclusions

This study provides strong preliminary data supporting the reliability and validity of a new measure of IM for DM in youths. The IMI-DM has high clinical utility as it can easily be used and scored to identify patients with low motivation as well as track changes in motivation across time. Correlates of IM indicated that higher motivation was associated with lower levels of diabetes family conflict, less depression, increased general self-worth, and greater youth responsibilities for self-management. Therefore, these factors may be important to consider in interventions to increase motivation and improve regimen adherence and glycemic control in youth with T1D. More research is needed to demonstrate the validity of the measure with larger samples of ethnic minority as well as non-minority youth with T1D. Further work should also demonstrate the validity of the subscale scores with factor analysis.

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Table 1.

Descriptive Data for Demographic, Clinical, and Psychosocial Variables

	Mean	Standard Deviation
Age	13.49	1.27
Father's Highest Grade	13.29	2.49
Mother's Highest Grade	13.12	2.15
Diabetes Duration (years)	6.03	3.87
A1C	8.79% (72.6 mmol/mol)	1.69
A1C-6 month follow-up	8.91% (73.9 mmol/mo)	1.26
DSMP Family Total	57.19	8.67
Family DSMP Exercise	4.73	2.52
Family DSMP Hypoglycemia	7.89	1.73
Family DSMP Eating	11.86	2.61
Family DSMP Insulin	12.9	2.66
Family DSMP Blood	19.8	4.35
DSMP Family Total-6 month follow-up	56.66	10.03
IMI Total	5.16	1.22
IMI Importance	5.41	1.24
IMI Confidence	4.95	1.38
IMI Total-6 month follow-up	5.11	1.20
IMI Importance-6 month follow-up	5.53	1.33
IMI Confidence-6 month follow-up	4.75	1.21
DFRQ Parent	30.28	7.62
DFRQ Youth	34.29	4.12
DFC Parent	33.4	11.34
DFC Youth	28.33	7.79
Youth Depression	6.96	8.31
Youth General Self Worth	19.51	3.87

Table 2

IMI for Diabetes Self-Management

1. I think I am pretty good at managing my diabetes.
2. Compared to other kids, I think I do pretty well when it comes to managing my diabetes.
3. After managing my diabetes for a while, I feel pretty competent in managing my diabetes.
4. I am satisfied with my ability to manage my diabetes.
5. I am pretty skilled at managing my diabetes.
6. I put a lot of effort into managing my diabetes.
7. I don't try very hard to do well in my diabetes self-care tasks.*
8. I try very hard to manage my diabetes and have good blood glucose control.
9. It is important for me to do well at managing my diabetes.
10. I don't put much energy into managing my diabetes.*
11. Overall, having good blood sugar control is very important to me, a priority in my life.
12. Overall, I feel confident in being able to manage my diabetes so that my blood sugar is in good control.

* reverse scored items

Confidence scale: #1–5, 12

Importance scale: #6–11

Table 3.

Correlations between IMI-DM and Criterion and Predictor Variables

	IMI-DM Total	IMI-DM Confidence	IMI-DM Importance
Criterion Variables			
A1C	−.462**	−.532**	−.293*
Family DSMP Total	.603**	.513**	.616**
Family DSMP Exercise	.353**	.296*	.367**
Family DSMP Hypoglycemia	.407**	.333*	.433**
Family DSMP Eating	.597**	.579**	.518**
Family DSMP Blood	.324**	.243	.372**
Family DSMP Insulin	.266	.222	.277*
Predictor Variables			
DFRQ Youth	.102	.082	.109
DFRQ Parent	.295*	.341*	.184
DFC Youth	−.399**	−.361**	−.380**
DFC Parent	−.113	−.145	−.053
Youth Depression	−.371**	−.354**	−.330*
Youth General Self Worth	.401**	.361**	.389**

* p<.05

** p<.01