

# An initial evaluation of the design of pediatric psychology consultation service with children with diabetes

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## Abstract

The objective of this study was to review the process of psychology consultation with an outpatient pediatric diabetes service, and provide data regarding assessment and outcome. The purpose was to demonstrate that the inclusion of psychology in the care of the child would enhance the effectiveness of treatment delivery. Over a one-year period, 91 psychological consultations were reviewed for information related to reasons for referral, diagnosis, and treatment. Processes of assessment and collaboration are described. Nearly half of all the participants that were referred for a consultation met the criteria for a psychiatric disorder, including Attention-Deficit Hyperactivity Disorder, mood disorder or anxiety. Paired *t*-tests revealed significant improvement in metabolic control from referral to the next clinic appointment. Psychological consultation appears to have a positive impact on selected health outcomes. Given the large number of children with psychiatric disorder, psychological intervention

may facilitate adherence and reduce complications associated with poor metabolic control.

**Keywords** consultation • diabetes • pediatrics • psychology • treatment

## Introduction

In diabetes research there is significant support for the contention that psychological intervention is needed for individuals with poor adherence to their treatment regimen (Delamater et al., 2001). Individuals with diabetes not only have to remember to follow their regimen of insulin injections and blood glucose checks, but they also have to adapt their lifestyle, including food intake and exercise regimen. Research indicates there is an association between diabetes and severe psychiatric symptoms and/or conditions. Nearly half of all youths with diabetes were found to be at risk for the development of a psychiatric disorder within the first 10 years after diabetes diagnosis (Kovacs et al., 1997).

Goldston and colleagues (1997) found that adolescents with Type 1 diabetes expressed significantly more suicidal ideation than the general population. They also found that having these suicidal thoughts were correlated with non-compliance with the diabetes regimen. Additionally, and not surprisingly, adolescents with a diagnosable psychiatric illness were at significantly higher risk for poor adherence to their regimen. Similarly, Liss et al. (1998) provided evidence that children who had been hospitalized for severe diabetic ketoacidosis experienced significantly higher rates of psychiatric diagnosis than diabetes clinic control children. They found that these hospitalized children report lower self-esteem and social competence.

Inpatient care programs have been established to teach youngsters to cope with their diabetes, thereby improving adherence and consequently metabolic control of adolescents with poorly controlled diabetes. The results indicated that, via behavioral management and family therapy, an inpatient facility was able to improve metabolic control during the adolescent's stay on the unit; following discharge, school attendance was significantly improved and hospital admissions for diabetic ketoacidosis were significantly reduced (Geffken et al., 1997). Recent reviews have also highlighted the efficacy of outpatient psychological treatment (Delamater et al., 2001).

The pediatric psychology consultation service has become a primary activity for pediatric psychologists employed in major medical centers. It is geared towards assisting families during an inpatient stay at the medical center, or during a visit to their physician or medical clinic. The psychologist acts in the role of consultant and, at the request of the physician or nurse, works with the

family to address the concerns of the medical provider. After the interview, the psychologist then provides a report to the medical team regarding concerns and recommendations for improving care. This approach differs from traditional outpatient care because the mental health professional does not dictate the specific course of treatment, and meets with the family only during their visit to the clinic.

Psychology can offer the medical team the benefit of adjusting treatment approaches to the specific needs of the family. Psychological research has established an awareness of variables that might impair treatment adherence. For example, families of children in poor metabolic control are less likely to participate in diabetes research (Riekert and Drotar, 1999). As such, traditional interventions may not be as effective for this population. Similarly, demographic and socio-economic differences also exist in adherence and parenting styles (Davis et al., 2001), suggesting that cultural and lifestyle factors need to be investigated thoroughly. To illustrate, classic sociological research has revealed a cross-national pattern demonstrating that parental decisions about when to use punishment are learned through the conditions of the parental work environment (Kohn, 1977). Following a clinical intake with the family, the psychologist can provide feedback to the team on why previous approaches may have been unsuccessful.

Despite the presence of a consultation liaison service in multiple settings, few studies were found that detailed both the subjective and objective outcomes of consultation. Studies have been performed that have provided descriptive analyses of the referral population. Evaluations of treatment effectiveness in primary care settings have provided evidence that psychological intervention results in increased parental satisfaction, behavioral ratings of improvement by therapist and parents, and objective measures of improvement, including decreased medical visits (Finney et al., 1991; Sobel et al., 2001). A study regarding pediatric psychology consultation requests provided data on referral issues, student participation and physician satisfaction (Rodrigue et al., 1995). However, research was not found that specifically examined health-related changes in the child in response to the consultation. Kazak et al. (2002) provide a family systems model for patient care, but outcomes are not reported except as case examples.

The purpose of this study was to provide an evaluation of a diabetes consultation liaison service and to evaluate initial evidence of effectiveness of treatment. Specifically, results were analyzed to examine whether consultation could provide similar benefits as inpatient treatment, at a lower cost. Each step of the consultation service is examined to provide a model for how psychology can be integrated into the outpatient clinic setting.

## **Method**

### ***Procedure***

All pediatric endocrinology patients referred by their pediatric endocrinologist or diabetes nurse for an outpatient psychology consultation during a one-year period were included in this audit. The Florida Department of Health created the Florida Initiative in Telehealth Education (FITE) to help improve care to children with diabetes in poor metabolic control throughout the state, including children in medically under-served areas of Florida. The FITE program was supported by the Florida Department of Health and Children's Medical Services (CMS), a state-funded health insurance program for children from lower-income families. CMS provided reimbursement for psychology services in the various diabetes clinics, and for psychological follow-up in a psychology clinic.

Information on each patient was collected via review of the patient's psychology and pediatric endocrinology charts. The data that were collected included the reason for referral, psychological diagnoses, treatment recommendations, whether follow-up care was sought, and their HgbA1c at each visit. HgbA1c is the measure of glycosolated hemoglobin that is used to provide an estimate of the average blood sugar for the previous three months. Children with increased HgbA1c values are at increased risk for diabetes-related complications (Rewers et al., 2002). This study qualified for 'exempt' status as specified by the Institutional Review Board.

### ***Assessment***

The collaborative diabetes team included pediatric endocrinologists, diabetes educators, psychology staff, and nutrition staff. Following assessment, members of the team would determine the family's readiness to change. Once this was resolved, an intervention could be prescribed that best met the specific needs of each family.

The assessment of readiness for change was based on the framework provided by the Transtheoretical Stages of Change Model (Prochaska and DiClemente, 1982). This model specifies that when attempting to begin a program for change, it is essential to be aware of how ready the client is to make changes. Based on the specific stage of readiness for change, an appropriate treatment can be prescribed for the individual. The model contains five distinct stages that define the process of behavior change. The five stages of change are: pre-contemplation (not actively considering behavior change); contemplation (beginning to consider change); preparation (making arrangements necessary to make change possible); action (making the change itself); and maintenance (integrating behavior change into the individual's lifestyle).

Assessments were conducted in the diabetes clinic, often with diabetes staff present. The purpose of including the diabetes educator in the interview process

was to avoid redundant questioning, and to help facilitate the provision of medical care. Psychology staff conducted one of two types of interviews with referred families: problem-focused or comprehensive interviews. The decision regarding the type of assessment that was appropriate was often dictated by the nature of the referral. Specifically, problem-focused assessments were utilized more often in cases where the referral issue was circumscribed and easily amenable to behavioral treatment. Comprehensive assessments were used when the referral concerns were more global, and the specific means of treatment were not immediately apparent.

Problem-focused assessments generally lasted between 15 and 40 minutes. The purpose was to obtain substantial information about a specific concern so that treatment gains could be maximized. Often, there was brief assessment of mental status and emotional functioning, but these issues were not explored in significant detail. Instead, the focus was on helping the family to solve a specific problem, or resolving a circumscribed situation that had been causing difficulties. Frequently, the entire family was involved for the entire assessment to facilitate information exchange regarding how change would evolve. Problem-focused assessments were used most often with children who had been referred for needle phobia and diabetes adjustment concerns. These are situations in which the problems did not require intensive assessment, and resolution of the concern was part of the normal process of adjusting to a chronic illness.

Comprehensive assessments were more appropriate in situations where the child's behavior was placing their health at risk, when psychopathology was suspected, or where family dynamics were suspected to be interfering with adherence. Comprehensive assessments were longer than problem-focused assessments, often running from 30–75 minutes. These assessments mirrored traditional psychotherapy intakes. Thorough assessments of mood, behavioral functioning, academic performance, familial relations, and medical/psychological histories were performed to obtain a thorough diagnostic picture of the family and child. The family was asked to recall each step of diabetes adherence, in order to identify the behavior that presented the greatest challenge and that required immediate attention. While the disadvantage of these assessments was that they generally took more time, the major benefit was that they provided a wider spectrum of behavior to help to direct treatment, and make adjustments to the diabetes regimen. The majority of the consultations were comprehensive assessments.

## Results

Over a period of one year, 91 psychology consultations were requested by the child's pediatric endocrinologist. Psychology consultations were given twice on 10 of the children, yielding a data pool that consisted of 81 unique families. Of

those 81 children with diabetes, 60 percent were female, 69 percent Caucasian, 21 percent African-American and 10 percent Hispanic. The average age of the children in the sample was 12.86 years, with a range from 3 to 21 years. The mean HgbA1c at the time of referral was 9.8 percent (range = 5.7% to 15.5%). Looking only at the children referred for poor metabolic control, the mean HgbA1c was 10.5 percent (range = 8.0% to 15.5%).

Of all the referrals, 62 percent were requested to address concerns that were related to poor metabolic control. Often, these types of referrals would be requested when the adolescent was not taking injections, not checking blood sugars regularly, or failing to follow their prescribed diet plan. Children were included also in this category if they failed to rotate injection sites properly or were being untruthful regarding how they cared for their diabetes. A further 13 percent of all referrals were requested to address alternative aspects of diabetes management. The majority of these consultations were regarding social adjustment to diabetes, including talking to friends and teachers about their disease. Other concerns involved eating and injecting insulin in public, diabetes and sexuality, and resolving parental disagreements regarding how diabetes should be properly managed in the home. An additional 4 percent of consultation requests were asked to address needle phobias, and 3 percent of consultations were requests to assist in assessing readiness for transition to the diabetes pump.

The remaining consultation requests were made to address issues that were unrelated to diabetes; 11 percent of the requests were to address the child's emotional functioning. Often, the child's physician or nurse had concerns regarding suicidal ideation, generalized anxiety, adjustment to life events, or potential depression/bipolar disorder. The remaining 7 percent were requests to help the family to develop a plan to manage the child's behavior. While the majority of this last group of families had children with Attention-Deficit Hyperactivity Disorder (ADHD) or Oppositional Defiant Disorder, issues including sleep and school difficulties were seen as well.

Diagnostically, the results of assessments revealed that 47 percent of the children who were referred for consultation met the criteria for a psychiatric disorder (other than psychological factors affecting a medical condition or an adjustment disorder), as defined by the DSM-IV (American Psychiatric Association, 1994), a diagnostic guide to psychiatric illness developed by the American Psychiatric Association. Of all the children, 25 percent met the criteria for ADHD, 21 percent met the criteria for a mood disorder (e.g. major depressive disorder, bipolar disorder, dysthymic disorder) and 6 percent met the criteria for an anxiety disorder. Amongst those who had poor metabolic control, 51 percent were diagnosed with a DSM-IV disorder, 31 percent met the criteria for ADHD, 23 percent met the criteria for a mood disorder and 7 percent met the criteria for an anxiety disorder.

### ***Treatment and outcome of consultation***

Of the psychology consultations, 58 percent contained a referral for additional psychological assistance, and 6 percent of these consultations contained a direct referral to psychiatry. Of the 56 children referred for poor metabolic control, 41 returned for their scheduled follow-up appointment (within three months). Paired *t*-tests revealed that HgbA1c had decreased significantly from referral to the child's next appointment ( $t(40) = 4.03, p < .001$ ). The average decrease was approximately 0.8 percentage points. Given that a reduction of HgbA1c by 1 percent has been shown to reduce risk of long-term complications by approximately 35 percent, these results appear clinically significant as well (Diabetes Control and Complication Trial Research Group [DCCT], 1993). Of all the children who had poor metabolic control, 84 percent had reduced their HgbA1c by their next appointment.

To address concerns that these decreases were part of a downward trend, paired *t*-tests were conducted to examine changes in HgbA1c at the visit prior to referral and the follow-up visit. These means were not significantly different, providing evidence that improvement was not already ongoing prior to intervention ( $t(40) = 1.56, p > .05$ ). In other words, there was no significant downward or upward trend prior to treatment. Additionally, regression to the mean analysis was performed to further examine these concerns. The correlation between referral HgbA1c and follow-up HgbA1c was found to be 0.75, which indicated that 25 percent of these results were attributable to regression to the mean (Hopkins, 2002). Overall, this indicates that 75 percent of the variance can be explained by factors other than regression to the mean.

### **Discussion**

The predominant finding to emerge from this analysis is that the metabolic control of children who received a psychology consultation in a diabetes clinic improved, on average, by 0.8 percentage points. This finding is noteworthy, particularly given that the finding that a one point decrease in HgbA1c can result in a significant decrease in the incidence of long-term complications of diabetes (DCCT, 1993). Further analyses revealed that for the most part, these findings were neither the product of a statistical anomaly nor part of a descending baseline. No studies were found that demonstrate that improvement in metabolic control would be seen from one clinic visit to the next, beyond what random variance and regression to the mean would predict.

Assessment, in particular, is an area where interdisciplinary involvement can provide personalized and efficient care to the family. Specifically, whenever diabetes nurses were able to determine in advance that a patient would benefit from a psychology consultation, joint family intakes were conducted often with psychology staff and nurses present. As a result, the psychology staff could

become aware of many of the pragmatic necessities of diabetes management, and nursing staff could be exposed to the behavioral and environmental constraints on the family that might not normally be part of a clinic intake. This allows for flexible decision-making by practitioners, and increased efficiency by reducing the time spent in clinic.

Another relevant finding to emerge was the prevalence of psychopathology in the diabetes population. Specifically, nearly one-third of the children in poor metabolic control met the criteria for ADHD. In studies of ADHD treatment, it is often stressed that in order to bring about behavior change, accommodations are needed in the home and school settings to ensure increases in appropriate behavior. In diabetes care, particularly when ADHD is not diagnosed, it is unlikely that the adherence regimen has been adapted to enhance the likelihood of behavior increase. A future application of this finding could be the analysis of whether successful treatment of ADHD symptoms in children with diabetes results in improvements in metabolic control. In a similar vein, initial treatment of ADHD with stimulant medication often results in appetite loss, which could influence metabolic control for children on a fixed insulin regimen. While the incidence of emotional disturbance and anxiety were not found to be as high as ADHD, similar accommodations may be needed when these conditions are detected.

Of this sample, 47 percent met the criteria for a psychiatric disorder. Similarly, Kovacs et al. (1997) reported, across the 10 years following diagnosis, that approximately 47 percent of the sample they tracked developed a psychiatric disorder. This is initial evidence that the cross-sectional and lifetime prevalence rates of this disorder seem to be congruous. There are now multiple data points to suggest that possibly half of the population of children with diabetes either have a mental disorder, or are at risk for developing a disorder during childhood. However, this finding must be interpreted with some caution, as this study yielded higher rates of behavioral disorders, and lower rates of depression and anxiety. Nonetheless, there is initial evidence that diabetes may influence biological mechanisms of mental health (Jacobson et al., 2002). Further study is needed to clarify the diagnostic specifics, and to determine whether these differences are based on geography, sampling, or another variable.

With regard to the sample itself, ethnically, the sample was roughly comparable to the ethnic demographics of the diabetes clinic (71% Caucasian, 18% African-American, and 11% other). As such, there did not seem to be a referral bias on the basis of ethnicity. However, 60 percent of the referrals were female, which suggests over-representation. A future issue for study is whether this occurred due to genuine needs of the young females, or as a result of a referral bias. According to the DSM-IV, women are more likely to be diagnosed with depression and eating disorders, which may help to explain why they receive more referrals for psychological consultation (American Psychiatric Association, 1994).

The design of this analysis represents an appeal to external validity. As noted throughout, this approach does not employ the rigorous research design that is often required of treatment research. Instead, it is reliant upon examining outcome within the demands of a highly-active diabetes clinic in a major medical center. As a result, a study of this kind has low internal validity, meaning that it is not entirely clear that intervention by psychology is the reason for health improvement in this population. However, it does suggest that over 80 percent of patients improve their metabolic control when psychology is involved in their care, without regard to patient ethnicity, socio-economic status, or gender, as part of normal clinic functioning. The results of numerous expectancy biases are removed, including the classic Hawthorne effect (i.e. the tendency of individuals to change their behavior when they are observed). Additionally, no limitation was placed on the type of intervention that was provided, which allowed providers to make normal clinical decisions based on the presenting issues of the family. Thus, what is assessed is the ability of the diabetes team to fit the treatment to the individual, rather than the reverse.

While health outcomes have been evaluated for this data, before examining the numbers, it is important to highlight several limitations. By necessity, there is no placebo comparison group. Attempting to provide a 'faux' treatment to half of the families consulted was judged to be unethical, particularly given the poor health status of many of the children in this study. However, because a control group is lacking, interpretation of these data should be limited to examining outcomes that are specific to psychological involvement. Similarly, due to extraneous variables, including the geographical distance from clinic, physician protocol, and clinic scheduling, the data regarding patients' return to clinic is variable, ranging from one to three months. While it would have been optimal from a research perspective to have all the patients return to clinic within a specified timeframe, the goal of consultation is to assist in the provision of care to the medical service, and not to impose research goals that would interfere with optimal care of the patient.

Overall, these data provide evidence that psychological consultation in the pediatric clinic can have a positive effect on disease status for children with poor metabolic control. Additionally, psychology staff can be used to provide a variety of services to the team, including attending to psychiatric diagnoses that are interfering with disease management and providing problem-focused assistance for circumscribed difficulties. Psychology, via consultation, can function in a variety of capacities to enhance the quality of medical care on an outpatient basis. It is essential that psychologists continue to review the effectiveness of their consultation, so that this branch of treatment can become an entrenched part of medical institutions treating pediatric illness.

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