

Proposing an Acceptance and Commitment Therapy Intervention to Promote Improved Diabetes Management in Adolescents: A Treatment Conceptualization

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Abstract

Pediatric diabetes is linked with adverse medical outcomes, the risks of which increase with poor or intermittent adherence (Diabetes Control and Complications Trial Research Group, 1994). Further, during adolescence, diabetes management tends to deteriorate (Anderson & Laffel, 1996; Bryden et al., 2001; Insabella, Grey, Knafel, & Tamborlane, 2007; La Greca, Follansbee, & Skyler, 1990). This paper proposes that cognitive fusion and experiential avoidance negatively influence diabetes management behaviors in adolescents. To date, no published interventions address these psychological processes in this patient group. Acceptance and Commitment Therapy (ACT) is presented as an approach for targeting experiential avoidance and cognitive fusion among adolescents with diabetes.

Keywords

Diabetes, Adolescence, Cognitive Fusion, Experiential Avoidance, Acceptance and Commitment Therapy

Pediatric diabetes is prevalent (Centers for Disease Control and Prevention, 2008) and can be challenging to manage (Wysocki, Greco, & Buckloh, 2003). Further, management tends to deteriorate during adolescence (Anderson & Laffel, 1996; Insabella, Grey, Knafel, & Tamborlane, 2007; Bryden et al., 2001; La Greca, Follansbee, & Skyler, 1990). Type 1 diabetes mellitus (DM1) is among the most common pediatric chronic illnesses, occurring in approximately one in every 500-600 youths (Centers for Disease Control and Prevention, 2008). Additionally, rates of pediatric Type 2 diabetes mellitus (DM2) are on the rise (Laron, 2002) and represent 10-20% of new cases of pediatric diabetes (American Diabetes Association, 2000). Diabetes management aims to maintain normal, or near-normal, Hemoglobin A1C (HbA1c; a marker of blood glucose) levels, which can reduce the risks of complications to levels equivalent to the general population (Wysocki et al., 2003). Regulating HbA1c involves intensive daily management, which can include monitoring blood glucose levels multiple times per day and multiple insulin injections or the use of an insulin pump, in addition to careful dietary management utilizing carbohydrate counting, and physical activity level management (Wysocki et al., 2003). Further, a certain degree of flexibility in diabetes management may prove beneficial, such as matching insulin doses to carbohydrate intake and adjusting for exercise, without increasing hypoglycemic episodes (Lowe, Linjawi, Mensch, James, & Attia, 2008). As such, diabetes can be challenging to manage, requiring a complex set of self-management tasks (Lowe et al., 2008; Wysocki et al., 2003), and management tends to deteriorate during adolescence (Anderson & Laffel, 1996; Bryden et al., 2001; Insabella, et al., 2007; La Greca, et al., 1990). Psychosocial interventions may facilitate improved diabetes management (Murphy, Rayman, & Skinner, 2006; Peyrot & Rubin, 2007).

■ Psychosocial Interventions for Pediatric Diabetes

This section will review a few key findings from the extensive body of work on psychosocial interventions for pediatric diabetes. Pediatric DM1 psychosocial intervention studies have examined a number of different outcome measures and interventions (Murphy, et al., 2006; Peyrot & Rubin, 2007). These studies have included physiological measures of glycemic control (HbA1c), self-reported diabetes-related behaviors, quality of life, psychiatric symptoms, individual psychological variables, various aspects of peer and family relationships, and measures of social support (Murphy, et al., 2006; Peyrot & Rubin, 2007). Many of these studies included HbA1c, the primary marker of glycemic control, as an indicator of disease management. Most of the studies from a recent review, had similar, small, effect sizes for decrease of HbA1c (mean across studies: $d = 0.11$; median: $d = 0.17$; Murphy et al., 2006). A meta-analysis indicated large effect sizes (0.88) across a number of outcome variables for psychological interventions with pediatric patients with DM1 (or cystic fibrosis: the two illness categories were grouped together and included five studies on pediatric DM1 and two studies on cystic fibrosis; Beale, 2006). The outcome variables assessed in the meta-analysis were similar to those outlined above; however, only one study in this meta-analysis included HbA1c as an outcome variable, and an effect size was not available for this study (Beale, 2006).

Intervention studies aimed at improving management of DM1 have examined cognitive-behavior therapy (CBT), family therapy, peer group interventions, motivational interviewing, home visits, stress management training, coping skills training,

telephone support, and problem solving (Murphy et al., 2006; Peyrot & Rubin, 2007). Compared to other outcome measures, coping skills training has been shown to improve quality of life (Delamater et al., 2001), support and stress management interventions have been shown to lessen diabetes-related stress and improve social relationships (Rubin & Peyrot, 1992), and family-based interventions have been shown to improve family relationships (Delamater et al., 2001).

One notable study found large effect sizes for change in HbA1c: $d = 2.03$ (Satin, La Greca, Zigo, & Skyler, 1989). This study was a randomized controlled trial for adolescents with DM1. Satin et al. (1989) compared three conditions: A six-week multi-family group intervention, a six-week multi-family group intervention including one week of parent simulation of diabetes, and a control group. The parental simulation of diabetes included multiple blood sugar tests and saline injections. The multifamily group therapy with parental simulation of diabetes condition demonstrated the largest effect size for changes in HbA1c ($d = 2.03$; Satin et al., 1999). Unfortunately, despite the promising outcomes reported in this study over two decades ago, it does not appear that there has been follow-up research, and these findings do not appear to be widely utilized. One possibility is that this intervention may lack practical feasibility in clinical settings due to the intensive format and the involved nature of the family component.

In sum, there is a wide breadth of research on psychosocial and behavioral interventions for adolescents with diabetes, and current psychosocial interventions have demonstrated modest effects on glycemic control (Murphy et al., 2006). It may prove useful to identify underlying psychological processes that contribute to poor management. This paper aims to illustrate how the psychological processes of cognitive fusion and experiential avoidance may contribute to diabetes management difficulties. These processes are targeted in Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999).

■ An Introduction to Acceptance and Commitment Therapy

This paper will propose that an ACT intervention may be particularly well suited to adolescents who struggle with diabetes management. ACT is among the newer generation of functional contextual behavior therapies that aims to promote *psychological flexibility*, which involves psychological acceptance and committed action in the direction of values-based living (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). ACT interventions target cognitive fusion and experiential avoidance, which are psychological processes that in combination, give rise to psychological inflexibility (Hayes et al., 2006). Psychological inflexibility can increase the potential for, and exacerbate, human suffering (Hayes et al., 2006). ACT is grounded in and informed by a philoso-

phy of science, functional contextualism (Biglan & Hayes, 1996; Gifford & Hayes, 1999) and a basic science, Relational Frame Theory (RFT: Barnes-Holmes, Barnes-Holmes, McHugh, & Hayes, 2004; Hayes, Barnes-Holmes, & Roche, 2001).

The role of language in human experience is central to the philosophical and theoretical underpinnings of ACT and integral to its clinical applications (Hayes et al., 2006). Important to ACT is the premise that there are both positive and negative effects of human language (which includes private uses of language such as thought) and that language facilitates the ability to engage in verbal activities such as evaluating, comparing, relating, and categorizing (Hayes, 1999). Language also facilitates the ability to compare the present moment to the past and the future and to take the individual out of the present moment (Hayes, 1999). Due to the capacity for internal symbolic representation, an individual may engage in behaviors not directly related to the present moment (not in relation to direct environmental contingencies), or in the direction of their values, but instead engage in behaviors to attempt to avoid or control thoughts or other private events (emotions, memories, images, physical sensations; Hayes et al., 1999). For example, an adolescent with diabetes who has been teased at school for having to check their blood glucose, may be thinking about this when they are spending time with friends (who did not tease them) and choose not to check their blood glucose when they need to, and go against a personal value of attending to their physical well-being.

In relation to this conceptualization, ACT clinical methods seek to modify the function and behavioral impact of private events; ACT interventions teach individuals to experience a full range of private events and to engage in values-consistent behavior irrespective of how they feel (Hayes, Strosahl, & Wilson, 1999). ACT clinical methods target experiential avoidance and cognitive fusion, which are distinct, yet related processes (Hayes et al., 1999).

Cognitive Fusion and Experiential Avoidance

Cognitive fusion is the tendency for humans to mistake private events as representing reality and then ‘fuse’ with, or attach to, the content of these events (Greco, Lambert, & Baer, 2008; Hayes, et al., 1999). For example, an individual may have a thought such as “I am worthless” and take this thought to accurately represent reality and attach to the verbal label “worthless”. An ACT perspective would not be concerned with altering this thought or trying to introduce alternate thoughts, but would instead emphasize the individuals relation to the thought as a verbal event, as a behavior, as ‘just a thought’ as opposed to being concerned with its content. An ACT intervention targeting cognitive fusion may emphasize noticing the ongoing, transitory, process of thinking as opposed to attaching to the content of any particular thought (Greco et al., 2008).

Experiential avoidance (or control) is an unwillingness to experience, or stay in contact with, private

events (e.g., thoughts, feelings, images, physical sensations) and attempts to avoid or otherwise control these experiences (Hayes & Gifford, 1997). From an ACT perspective, experiential avoidance is posited as a natural part of human experience due to a socially maintained functional context of literality of language resulting in entanglement with private events (Hayes et al. 1999; Hayes et al., 2006). Experiential avoidance can present in a myriad of ways (Hayes & Gifford, 1997).

The collective adult data provide support for the premise that high levels of cognitive fusion and experiential avoidance are linked with adverse outcomes in adult clinical and community samples (for a review see Hayes et al., 2006). Further, evidence links experiential avoidance and cognitive fusion to adverse outcomes in children and adolescents (Greco et al., 2008). Greco et al. (2008) utilized a sample of over 1,300 children and adolescents, and found psychological inflexibility (cognitive fusion and experiential avoidance) linked with maladaptive outcomes among youth (Greco et al., 2008). These included increased levels of self-reported anxiety, somatic complaints, and problem behaviors with medium to large effect sizes ($r_s = .37 - .64$) and decreased quality of life with medium to large effect sizes ($r_s = .29-.43$; Greco et al., 2008). Experiential avoidance and cognitive fusion also correlated with teacher reports of social skills, behavior problems, and academic competence, although these findings were less consistent and effect sizes were small (Greco et al., 2008).

Cognitive Fusion and Experiential Avoidance in Adolescents with Diabetes

This section will provide a conceptualization of, and present support for, the roles of experiential avoidance and cognitive fusion in pediatric diabetes management. The conceptualization will include clinical illustrations within this population. The supporting data will include findings that do not explicitly label cognitive fusion and experiential avoidance, but that illustrate these processes in patients with pediatric diabetes and provide support for their potentially adverse effects.

Conceptually, adolescents with diabetes, who fuse with their private events and subsequently engage in experiential avoidance, may attempt to control their private events via behavioral strategies that may not be useful in the long-term. For example, an adolescent with diabetes may fuse with thoughts such as “People think I’m different when they see me check my blood sugar,” “My insulin makes me fat and unpopular,” “I can’t do normal things like go out for ice-cream”, or “I won’t have a normal life.” They may then engage in unhealthy eating (e.g., unplanned snacking), or avoid insulin injections or blood-glucose checks, as an attempt to alleviate these painful thoughts. These experiential avoidance behaviors may lead to greater long-term emotional distress and health problems. Since, by not engaging in diabetes management behaviors, adolescents are at increased risk for later medical complications (Diabetes Control and Complications Trial Research Group, 1994).

Findings from the illness identity literature arguably provide support for the proposed relation of cognitive fusion and adverse outcomes in adolescents with diabetes. This paper proposes that attachment to a conceptualized self, or a strong identification with a conceptualization of the self as ill, or illness identity, implies cognitive fusion. An adolescent with diabetes may have a thought that ‘I am sick’. Those who do not have this or related thoughts, or who do not fuse with this thought by taking it to represent reality and attaching to it, may descriptively conceptualize themselves as a person who is experiencing a collection of physiological processes that constitute ‘diabetes’ as opposed to identifying their being in relation to diabetes. Adolescents who fuse with the thought ‘I am sick’ and take it to represent reality, identify their being, or identity, as sick. As illustrated in Hayes et al., (1999), ‘am’ is a form of the word ‘be’, so the statement ‘I am...’ is a commentary regarding being. As such, those who fuse with cognitions about being sick will have a stronger illness identity.

In adolescents and young adults with DM1, a strong illness identity was correlated with a belief in serious diabetes consequences ($r = .41, p < .001$) and a decreased belief that they could cure or control their diabetes ($r = -.31, p < .001$; Griva, Myers, and Newman, 2000). Additionally, when controlling for age, diabetes duration, and self-reported adherence, illness identity accounted for a significant amount of variance in HbA1c ($\beta = .28, p < .01$), where a stronger illness identity was associated with higher HbA1c levels (Griva et al., 2000). This finding may indicate that adolescents with diabetes who over-identify with their illness may respond inflexibly and display poorer adherence and worse disease management; an adolescent with diabetes who fuses with cognitions about their illness and their self may experience discomfort due to this cognitive entanglement and engage in behaviors that are non-adherent in an attempt to alleviate this discomfort.

Experiential avoidance may also be relevant for adolescents with diabetes. Conceptually, adolescents with diabetes who struggle with the thought ‘I’m different’ may try to avoid the associated discomfort of being noticed as different through avoidance of diabetes-related activities to hide the visibility of their illness. Avoidance of diabetes-related thoughts and feelings may also be associated with poorer diabetes management. Evidence from adult populations with DM1 and DM2 suggests that avoidance of negative diabetes-related thoughts and feelings is associated with lower adherence (Weijman et al., 2005). Adolescents with diabetes who use avoidant coping styles are, similarly, less likely to be adherent with their treatment regimens (Hanson et al., 1989; Reid, Dubow, Carey, & Dura, 1994).

Finally, psychological flexibility (the converse of experiential avoidance and cognitive fusion) has been directly assessed in a pediatric diabetes sample using the Diabetes Acceptance and Action Scale for Children and Adolescents (DASS; Greco & Hart, 2005). Preliminary analyses indicated that psychological flexibility was significantly positively correlated to diabetes-related quality of life ($r = .36$), adherence to medical regimes ($r = .30$), and

significantly negatively correlated to social anxiety ($r = -.36$) and diabetes-related worry ($r = -.41$; Ciarrochi & Bilich, 2006). These findings indicate that increased cognitive fusion and experiential avoidance relate to decreased adherence and diabetes-related quality of life, and increased social anxiety and diabetes-related worry (Ciarrochi & Bilich, 2006). In sum, these findings provide preliminary support for the adverse impact of cognitive fusion and experiential avoidance for adolescents with diabetes.

■ ACT Interventions

There is a growing body of evidence to support the efficacy and effectiveness of ACT across various populations (e.g., Hayes, Masuda, Bissett, Luoma, & Guerrero, 2004). Specifically, ACT has been applied across a number of chronic health condition populations, such as cancer (Montesinos, Hernández, & Luciano, 2001) and chronic pain (McCracken, Vowles, & Eccleston, 2005). ACT interventions have also been used with adolescents who suffer from chronic health conditions, such as pain conditions (Greco, Blomquist, Acra, & Moulton, 2011; Wicksell, Melin, & Olsson, 2007).

A pilot study provides support for the use of ACT with adolescents with chronic pain (Wicksell et al., 2007). In this study, 14 adolescents with idiopathic chronic pain underwent an ACT intervention consisting of 5 – 29 individual therapy sessions ($M = 14.1$; $SD = 6.6$). Results demonstrated significant reductions in school absence, pain intensity, and pain interference, and a significant increase in functional ability across post-treatment, 3- and 6-month follow-up (Wicksell et al., 2007). Further, cross-sectional data from a different sample of adolescents with chronic pain, indicate that higher levels of *acceptance* (targeted in ACT as an alternative to experiential avoidance) relate to higher levels of a range of domains of functioning (McCracken, Gauntlett-Gilbert, & Eccleston, 2010). While further research is needed to build on these findings, they provide support for targeting acceptance (which will be further discussed later in this paper) to impact behavioral outcomes. Although the outcomes assessed in these studies may not be directly comparable to a population of adolescents with diabetes, these data illustrate the use of an ACT intervention with adolescents who have a chronic health condition, to increase school attendance and a range of functional abilities, via targeting cognitive fusion and experiential avoidance. Targeting these processes in adolescents with other chronic health conditions such as diabetes may similarly produce improvements in behavioral-health outcomes and engagement in diabetes management behaviors.

ACT has also been shown to be effective in improving diabetes management in adults with DM2 (Gregg et al., 2007). In a randomized controlled trial of adults with DM2, Gregg et al. (2007) compared an education intervention to education plus ACT. The target of this study was better management of diabetes and improved glycemic control. Gregg et al. (2007) found a significant effect of the ACT intervention over the control group for 'diabetic control status' (a variable that differentiated

between participants who were or were not in diabetic control, defined as HbA1c levels above or below 7%), with a medium effect size (partial $\eta^2 = .08$), after co-varying out pre-treatment status. In the education only intervention, 10 of the 38 participants were in diabetic control at baseline, and three of those in control at baseline were no longer in control at follow-up, leaving 2 of the remaining 28 participants in diabetic control. In the ACT group, 11 of 43 were in control at baseline and at follow-up, one was no longer in control, leaving 11 of the 32 completers in diabetic control at follow-up. Gregg et al. found a non-significant trend for the efficacy of the ACT intervention over the control group on HbA1c, with a small effect size ($\eta^2 = .04$). In addition, they found a medium effect size ($\eta^2 = .07$) for improved self-management behaviors in the ACT intervention over the control group. The researchers also tested for mediation and found that both acceptance and self-management mediated the relation between treatment type and HbA1c at follow-up. Even though the effect sizes were small to medium in this study, it is noteworthy that these results were based on a single day intervention. While it is not appropriate to make an age-downward extension to interpret these results, this research is an important example of ACT-relevant processes in a population of adults with diabetes.

ACT Interventions and Adolescents

ACT interventions may be particularly well suited for adolescents. The methods utilized in ACT may complement developmental changes that typically occur during the adolescent period, such as increased needs for autonomy (Holmbeck & Updegrave, 1995). ACT clinical methods explicitly focus on personal responsibility, choice, and values, to which adolescents who are seeking increased autonomy may be particularly receptive (Greco, Barnett, Blomquist, and Gevers, 2008). Additionally, ACT clinical methods utilize metaphors and experiential exercises, which are hard to obey or disobey (Greco & Eifert, 2004). If an adolescent is seeking increased autonomy and not responding well to direction, they may be more responsive to an approach that emphasizes choice based on personal experience. These aspects of ACT interventions may facilitate the developmental task of seeking increased autonomy and independence (Greco & Eifert, 2004).

■ Clinical Methods that Target Cognitive Fusion and Experiential Avoidance: Outlining an ACT Intervention for Adolescents with Diabetes

This section will discuss an ACT intervention that may be a useful supplement to diabetes education for adolescents with diabetes. Broadly, ACT interventions seek to weaken psychological inflexibility by targeting cognitive fusion and experiential avoidance using acceptance, mindfulness, cognitive defusion, and self-as-context methods. Acceptance involves an 'active and aware embrace' of private events, without

attempts to change their content, frequency or form (Hayes et al., 2006, p. 8). Mindfulness involves the practice of paying attention to private events and external stimuli in a curious, compassionate, and non-attached manner (Baer, 2003). Cognitive defusion methods aim to reduce the believability and behavioral impact of private events and often involve a process of de-literalizing thoughts (Hayes et al., 2006; Luoma & Hayes, 2003). Self-as-context is the observing self: The you that is ever present and distinct from your private events (Hayes & Gregg, 2001). Acceptance, mindfulness, defusion, and self-as-context are related, yet distinct processes that ACT interventions may target in parallel (Hayes et al., 2006). ACT interventions also include values clarification work and facilitate committed action in the direction of the individual's identified values (Hayes et al., 2006). This section will outline some key components that could be included in an ACT intervention for adolescents with diabetes, including: Creative hopelessness to facilitate acceptance; mindfulness exercises to facilitate contact with the present moment, acceptance and defusion; cognitive defusion exercises to promote acceptance by defusing the literality of language; and values clarification work. Finally, metaphors could be used throughout this therapy to target the context of literality of language, and valuing exercises to assist with establishing values-based life directions and goals (Greco et al., 2008; Hayes, et al., 1999, Hayes & Strosahl, 2004).

The proposed intervention would begin with *creative hopelessness*, an exercise designed to undermine the agenda to attempt to control private events (thoughts, feelings, sensations, memories, images, etc.; Hayes, 1999). Creative hopelessness has been adopted for use with children and adolescents as follows (Greco et al., 2008): Adolescents are asked to describe their negative experiences with diabetes management. A circle is drawn on a board and a distinction is made between things that occur in the adolescent's environment, or outside of the circle (e.g., increases in the frequency of required glucose testing, the need to adhere to dietary requirements, negative reactions from other people), and related private events, inside of the circle (e.g., thoughts such as "I can't stand this", feelings of frustration or embarrassment, etc; Greco et al., 2008). The content inside the circle is expanded upon and can be labeled as 'pain' (Greco et al., 2008). The therapist then encourages the adolescent to identify strategies they have tried to cope with this 'pain' (e.g., isolating oneself, eating, not eating, listening to music, consuming alcohol, seeking social support, faking blood glucose results, studying, shouting at family members, etc.). The therapist then asks the adolescent to consider the costs and benefits of each of these strategies in the short- and long-term. The aim of the creative hopelessness intervention is to illustrate for adolescents that they may not be able to get rid of (control or avoid) their diabetes-related 'pain' in the long-term and that some of the control strategies utilized (such as non-adherent strategies) may be causing damage (Hayes et al., 1999). The therapist could

then introduce the idea that while we may not be able to entirely avoid or control 'pain' in the long-term (and without negative consequences), what we can control is our behaviors (i.e., 'what we do with our hands and feet and mouths'; Greco, 2008; Hayes, et al., 1999; Hayes & Strosahl, 2004).

In addition to using creative hopelessness to bring patients into experiential contact with the fundamental un-workability of their control strategies, the proposed intervention would also utilize various mindfulness exercises. In an ACT framework, mindfulness exercises aim to promote acceptance, contact with the present moment, self-as-context, and cognitive defusion (Hayes et al., 2004; O'Brien, Larson, & Murrell, 2008). In an intervention specifically targeting adherence behaviors in adolescents with diabetes, mindfulness exercises might begin with a relatively straightforward noticing of breath, sounds, and the physical sensations associated with sitting and noticing, such as the sensation of skin on clothes or the feeling of an arm against a chair. Mindfulness exercises could then progress to begin to notice the ongoing process of thinking. Adolescents may be asked to picture themselves watching a movie and to observe each thought pass across the screen; adolescents would be asked to notice when they stop watching the screen and hook into a thought and would be reminded to return to 'watching the screen' (or noticing the ongoing process of thinking; Hayes & Strosahl, 2004). Ultimately, mindfulness exercises would be utilized that directly involved diabetes adherence behaviors such as mindfulness of eating, exercising, blood glucose monitoring, and mindfully administering insulin injections. Adolescents would be encouraged to notice the thoughts, emotions, and physical sensations that occurred prior to, during, and after these activities, to try to simply observe each thought as it occurred and to be willing to experience each emotion and physical sensation that emerged. They may be encouraged to metaphorically 'lean in' to the emotions, or to 'breathe in to' the areas of the body experiencing physical sensations.

In addition to utilizing mindfulness exercises throughout the course of therapy and encouraging the adolescent to practice these between sessions, the therapist would also introduce cognitive defusion techniques. Many of these techniques seek to undermine the literality of language (Luoma & Hayes, 2003). One example is the *milk, milk, milk* exercise (Titchner, 1916). This exercise involves rapid repetition of the word milk to weaken the literal and evaluative functions of language (e.g., milk = "tasty, white, drink") and bring patients into contact with other more direct properties of the word (e.g., the movements your mouth makes when you form the word, the sound of 'milk' just as a sound). The client then repeats this exercise with personally relevant content to demonstrate that literal mean-

ing attached to words can be weakened in different contexts (Hayes et al., 1999; Greco et al., 2008). An adolescent with diabetes may choose an emotionally salient thought such as "I'm sick" or "I am a freak". Through this exercise, the adolescent may begin to relate to their painful thought in a more flexible way. An additional cognitive defusion exercise is to notice a particular thought and thank the mind for that thought, (even a particularly negative thought) in an open and honest, and often playful manner, that may create some distance between the thinker and the thought (Hayes, Strosahl et al., 2004). These interventions, like all ACT interventions, do not seek to alter the content, frequency, or form of private events such as "I'm sick." Rather, interventions aim to alter an adolescent's relationship with these experiences (Greco et al., 2008; Hayes et al., 2009). Therefore, from an ACT perspective, it is fine to have the thought "Freak." ACT does not seek to alter this content at all. Rather, defusion and mindfulness methods alter the function of thoughts (e.g., the adolescent learns to experience the thought as less compelling; to experience it as just a thought and nothing more) and seek to alter the context of literality to one of defused, mindful experiencing (Hayes et al., 2006; Luoma & Hayes, 2003).

The proposed ACT intervention would also include values clarification work. The values compass exercise could be used (Greco et al., 2008). In this exercise, the therapist would ask the adolescent to consider multiple domains of life (family, friendship, couples/intimate relations, education, work, spirituality, citizenship, and physical self-care) and encourage him/her to identify domains that they experience as personally relevant. In the values compass exercise, a compass is literally drawn out and adolescents identify a valued direction in one of these domains (e.g., 'loving daughter') and then identify internal and external barriers (Greco, et al., 2008). Overcoming these barriers is then discussed; internal barriers through the therapeutic exercises that have been covered (defusion and mindfulness) and external barriers can be approached through committed action in valued directions (Greco et al., 2008). The therapist would also specifically encourage adolescents to consider the valued domain of physical self-care (including diabetes management) and work with them to identify barriers and ways to work with these barriers.

Finally, throughout the course of therapy, the therapist could emphasize the import of committed action in the direction of personally identified values. Committed action would be operationalized by facilitating adolescent identification of goals in the direction of their values. This would include goals specifically related to diabetes management behaviors.

In sum, it may prove useful to utilize an ACT intervention to target experiential avoidance and cognitive fusion in adolescents who struggle to manage diabetes. If problems of non-adherence are related to problems of cognitive fusion and experiential avoidance, then targeting these processes directly and encouraging adolescents to act in the direction of their values may enhance diabetes management. Future research is needed to empirically support such an ACT intervention with adolescents with diabetes.

■ Conclusion and Directions for Future Research

This paper aimed to frame adolescents' difficulties with diabetes management as resulting from the processes of cognitive fusion and experiential avoidance and to propose that an ACT intervention may be useful. This paper proposed that an adolescent with diabetes might fuse with aversive internal experiences and engage in avoidant behaviors that result in poor diabetes management; that experiential avoidance and cognitive fusion may account for diabetes management difficulties. As such, an ACT intervention may benefit adolescents who are struggling with diabetes management.

Future research may benefit from further direct investigation of experiential avoidance and cognitive fusion in adolescents with diabetes and the relation of these processes to diabetes management behaviors and HbA1c. Further, investigation of these processes in adolescents with both DM1 and DM2 may prove useful, to determine whether or not they operate in similar ways in both populations. Finally, intervention research may benefit from investigating an ACT intervention with adolescents with diabetes. ACT interventions may be a promising approach toward successful intervention to meet the needs of each adolescent.

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