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LOMA LINDA UNIVERSITY
School of Behavioral Health
in conjunction with the
Department of Psychology

Use of Multi-Informants in Predicting
Adolescent Treatment Dropout

by

David A. Mitchell, M.A.

Doctoral project submitted in partial satisfaction
of the requirements for the degree of
Doctor of Psychology

June 2015

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Each person whose signature appears below certifies that this doctoral project in his/her opinion is adequate, in scope and quality, as a doctoral project for the degree Doctor of Psychology

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ACKNOWLEDGMENTS

Completion of this project would not have been possible without the support and dedication of the faculty at Loma Linda University. Special thanks are due to the project chair Dr. Kimberly Freeman and the reader Dr. Adam Arechíga. It was also an honor to work with the many staff and administration members who have worked in the SHIELD program over the years. The program helps many teens and their families trying to understand and effectively address the problem of adolescent self-injury. This project is dedicated to the youth that have participated in the SHIELD program.

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ABBREVIATIONS

ANOVA Analysis of Variance

BASC-2 The Behavior Assessment Systems for Children Second Edition

BPD Borderline Personality Disorder

DBT Dialectical Behavioral Therapy

DBT-A Dialectical Behavioral Therapy for Adolescents

DSM-V Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition

IOP Intensive Outpatient Program

M Mean

NSSI Non-Suicidal Self-Injury

PDA Personal Digital Assistant

PRS-A Parent Rating Scale Adolescent

PRQ-CA Parent-Child Relationship Questionnaire-Child and Adolescent

RCI Reliable Change Index

SPSS Statistical Package for the Social Sciences

SR Self Report

SD Standard Deviations

YOQ Youth Outcome Questionnaire

ABSTRACT

A Study of the Use of Multiple-Informants to
Predict Adolescent Treatment Outcomes

by

David A. Mitchell

Doctor of Psychology, Graduate Program in Psychology
Loma Linda University, June 2015
Dr. Kimberly Freeman, Chairperson

High rates of dropout are common among adolescents in therapy making efforts to reduce adolescent psychopathology and behavioral problems challenging. The present study examined archival data from multiple informants who enrolled in a 16-week intensive outpatient treatment program for self-harming youth. The purpose of this study was to assess potential predictors of treatment dropout. Preliminary analysis indicated that adolescents who dropped out of treatment did not make clinically significant improvements when compared with adolescents who completed the program. This supports the need to retain adolescents in treatment for a complete course of treatment. The study also found that for the most part youth and parent YOQ subscale scores at pretreatment failed to identify reasons for discharge (graduate versus dropout). The sole predictor of dropout was adolescent reported intrapersonal distress assessed at pre-treatment. Specifically, results indicated that adolescents reporting lower degrees of intrapersonal distress at pretreatment were more at risk of dropping out of the program than their peers. By identifying predictors of dropout, clinicians can modify treatment and hopefully reduce dropout rates and improve outcomes for participants in the SHIELD program.

CHAPTER 1

INTRODUCTION

Non-Suicidal Self-Injury (NSSI) is a significant problem among adolescents as evidenced by its high prevalence rates and recent inclusion in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V) as a disorder for further study (American Psychiatric Association, 2013). In an attempt to address this issue within the Inland Empire, the Loma Linda University Behavioral Medicine Center (LLU-BMC) developed the SHIELD Program. This program is an intensive outpatient program (IOP) which uses Dialectical Behavioral Therapy for Adolescents (DBT-A) to treat youth. The program has been in existence since 2008. The SHIELD program has treated approximately 436 adolescents to address their self-harming behaviors and other social-emotional problems. Previous examination of SHIELD data has shown that the program is effective in significantly reducing self-harm and overall distress in adolescents who complete the program (James et al., 2014; James, Smith, Mayo, Morgan, & Freeman, 2013). Nevertheless, there is concern because the program has a high dropout rate with approximately 43% of participants leaving treatment early. Examining participant pre-treatment functioning factors may be one patient-focused approach that allows researchers and clinicians reduce the negative treatment outcome of dropout. As such, the SHIELD research group has attempted to find characteristics that identify those most at risk for dropping out of treatment. Identifying predictors of dropout can allow additional steps to be taken to keep adolescents in treatment in the future. This approach is consistent with past research endeavors, which have taken a patient-focused approach to help specific individuals who may not be responding to treatments or who are at risk for

other negative outcomes (Howard, Moras, Brill, Martinovich, & Lutz, 1996; Lutz, 2003; Nelson, Warren, Gleave, & Burlingame, 2013; Warren, Nelson, & Burlingame, 2009; Warren, Nelson, Mondragon, Baldwin, Burlingame, 2010).

When entering the SHIELD program, adolescents and their parent/caregivers complete a pretreatment assessment battery. Both parent and adolescent versions of the Youth Outcome Questionnaire are utilized (Burlingame et al., 2001; Burlingame, Wells, & Lambert, 1996; Burlingame, Wells, Lambert, & Cox, 2004; Burlingame, Wells, Lambert, Cox, Latkowski, & Justice, 2005). Subsequently, the YOQ is regularly administered to youth and their parents during the treatment process and at post-treatment. By tracking outcomes throughout treatment clinicians can monitor adolescent progress from week to week as the YOQ is sensitive to change and has the ability to measure overall distress and several other domains of functioning. The domains covered by the YOQ are intrapersonal functioning, somatization, interpersonal distress, social problems, behavioral dysfunction, and critical items (Burlingame et al., 2005; Burlingame et al., 1996). A slightly modified version of the YOQ is administered to parents or caregivers. The parents can then provide their own opinion as to how their youth are doing. The parent version includes the same domains as the youth version. Of note, self-injuring adolescents often struggle with many of the areas covered by the YOQ. As such, the YOQ appears to be a useful assessment tool for tracking social, emotional, and behavioral changes and outcomes of youth in the Shield program.

The researchers using the YOQ questionnaires have created a warning system for identifying clients most at risk of treatment failure (Burlingame et al., 2001; Warren, Nelson, Mondragon, Baldwin, Burlingame, 2010; Whipple, Lambert, Vermeersch, Smart,

Nielsen, S.L., & Hawkins, 2003). Youth showing an increase in symptoms from week to week and cases where there is little to no treatment improvement are identified. Although research has shown that the YOQ can be successfully used to identify those at most risk for poor outcomes over the course of treatment, it has not been used to identify various pre-treatment risk profiles or been used specifically with a population of self-injurers. Because of the YOQ's sensitivity, the present study will attempt to use this measure to identify pretreatment profiles for those youth in the SHIELD program. This research effort is attempting to identify those most at risk for treatment dropout.

The research literature indicates there are many challenges when attempting to identifying predictors of treatment dropout (Kazdin, Holland, & Crowley, 1997; Kazdin & Mazurick, 1994; Shelef, Diamond, Diamond, & Liddle, 2005; Warnick et al., 2012). As such, this study attempted to use multiple-informants to increase the likelihood of finding predictors of dropout. Furthermore, gathering information from multiple informants can be a practical way to try and gain greater understanding of adolescent treatment dropout, since each informant may have their own unique viewpoint regarding an adolescent's functioning (De Los Reyes & Kazdin, 2005, 2006). On the other hand, the child and adolescents research literature also demonstrates that using more than one informant can also pose special challenges, as discrepancies are often found between respondents' accounts (Achenbach et al., 1987; De los Reyes, 2011). The present study attempted to identify those most at risk for treatment dropout by assessing the predictive power of YOQ pretreatment ratings from multiple informants (adolescent and parent/caregiver) who participated in the SHIELD treatment program. By addressing the

high dropout problem, this study aimed to contribute to future increases in the number of adolescents receiving the maximum benefit from the treatment.

CHAPTER 2

LITERATURE REVIEW

This literature review begins with a discussion of the problem of NSSI among adolescents and its association with other serious mental health problems. Current research discussing the functions of self-injury and the treatment of NSSI is then reviewed. Next, the use of multiple informants for the assessment of youth's psychosocial functioning during the treatment process is explored, as well as ongoing efforts of clinicians and researchers to reduce adolescent treatment dropout. Finally, the overall goals and hypotheses of the study are presented.

Overview of NSSI

Self-injury can be a behavioral manifestation of emotional distress and is considered a high-risk behavior. NSSI is most often defined as the direct and deliberate destruction of one's body tissue without suicidal intent (Favazza, 1998; Nock and Favazza, 2009). Some of the most common methods of NSSI cited in the literature include: scratching to the point of bleeding, cutting one's self, carving into the skin, interfering with wound healing, hitting one's self, abrading, or burning one's self (Briere & Gil, 1998; Klonsky, 2011; Lloyd-Richardson, Perrine, Dierker, & Kelley, 2007; Simeon & Hollander, 2001; Walsh, 2006; Whitlock, Eckenrode, & Silverman, 2006). Of additional concern, research on adolescents who self-injure tends to find the presence, frequency, and form of NSSI can raise the likelihood of additional psychosocial problems including the risk of suicide (Whitlock, Muelankamp, & Eckrode, 2008). The

aforementioned findings demonstrate how serious the problem of self-injury is among adolescents.

The prevalence of adolescent self-injury is much larger than the general public may realize. High rates of self-injurious behaviors have been reported by researchers in the United States, Europe, China, Japan, Australia, and New Zealand, thus emphasizing the global nature of this problem (Klonsky, 2011; Kvernmo & Rosenvinge, 2009; Lars-Gunnar, Karim, & Quilisch, 2007; Laukkanen et al., 2009; Lloyd-Richardson et al., 2007; Tang et al., 2013; Matsumoto et al., 2008). In North American community-based samples, rates of adolescent self-injury have typically ranged between 12 and 46 percent (Jacobson & Gould, 2007; Lloyd-Richardson et al., 2007; Rodman & Hawton, 2009; Ross, Heath, & Toste, 2009; Ross & Heath, 2002). Adolescent NSSI rates in inpatient settings are reported to be even higher, ranging from 40 percent to 60 percent of study participants (Darche, 1990; DiClemente, Ponton, & Hartley, 1991; Kaess et al., 2013). These figures are particularly concerning considering the sheer number of youth acknowledging histories of NSSI on at least one occasion. Moreover, the prevalence estimates of NSSI may be conservative considering the stigma associated with self-injury (Raymond & Janisse, 2012). For example, in a recent study of college student's attitudes toward self-injury, evidence of negative attitudes toward self-injurers was reported. Specifically, students who held beliefs that self-injurers were responsible for their actions and were being manipulative were much more likely to express feelings of anger toward self-injurers and acknowledge reluctance to provide help. This finding is particularly concerning since many of the respondents in the study reported they were going on to become medical professionals who would be expected to encounter self-injurers during

their careers (Law, Rostill-Brooks, & Goodman, 2009). It is plausible that negative attitudes held by professionals could affect their interactions with self-injurers, and a potential consequence could be reluctance by self-injurers to accurately report their self-injury.

In addition to the above, another area of concern is the potential long-term consequences for youth who engage in NSSI. A recent study found individuals with histories of non-suicidal self-injury (NSSI) were more likely to be unmarried and have histories of mental treatment compared to their peers without histories of NSSI (Klonsky, 2011). Together the aforementioned findings highlight the importance addressing the problem of self-injury. Given that there are also several serious mental health problems associated with self-injury, there is even a greater need to provide youth with effective treatment.

Factors Associated with NSSI

There is ample evidence throughout the literature that self-injury co-occurs with a variety of psychological disorders and behavioral problems. For example, studies examining college students engaging in NSSI have found self-injury associated with symptoms of depression and anxiety (Andover, Pepper, Ryabchienko, Orrico, & Gibb, 2005; Klonsky, Oltmanns, & Turkheimer, 2003; Kvernmo & Rosenvinge, 2009). Other studies have evaluated the psychosocial risk factors among adolescent self-injurers. One notable study surveyed adolescents in three countries including the United States using the same assessment measures. Across the three samples, NSSI was associated with peer victimization, higher levels of depressive symptom, and family related loneliness

(Giletta, Scholte, Engels, Ciairano, & Prinstein, 2012). Interestingly, the authors of the study noted that the association between NSSI and substance abuse varied across the samples with the American sample having been observed to show a stronger relationship between NSSI and marijuana or cigarette use. In another study, Darche (1990) examined girls who self-mutilated and found that they were more likely to have higher reported symptoms of depression, anxiety, hostility, somatic complaints and eating disorders. This sample of adolescent self-injurers reported higher overall severity levels of pathology compared to controls, and they had more diagnoses overall.

In regards to personality functioning, NSSI has long been associated with Borderline Personality Disorder (BPD) due in part to its inclusion of self-harm in the criteria for the disorder (American Psychiatric Association, 2013). However, recent studies have reported subgroups of self-injurers that may be more or less likely to exhibit BPD symptomology. For instance, in a study of inpatient adolescents, patients with symptoms of NSSI were no more likely to have comorbid borderline personality disorder than to have disorders of anxiety and mood (Glenn & Klonsky, 2013). In another study, Muehlenkamp found when an adolescent reported two traits of BPD, identity confusion and unstable interpersonal relationships, researchers were able to predict suicidality and/or NSSI group membership (Muehlenkamp, Ertelt, Miller, & Claes, 2011). The above findings illustrate the often complex relationship between NSSI, suicidality, and BPD.

Alarming and perhaps most concerning of associated problems, is NSSI's relationship with suicidal thoughts and behaviors. Muehlenkamp reported that up to 70 percent of individuals with repetitive NSSI will attempt suicide within their lifetimes (Muehlenkamp & Kerr, 2010). A recent review of the NSSI literature by Hamza and

colleagues examined the associations between NSSI and suicidal behaviors (Hamza, Stewart, & Willoughby, 2012). In studies cited by Hamza, when comparing individuals with histories of self-injury to those without, NSSI history robustly predicted suicidal thoughts and behaviors (Andover & Gibb, 2010; Klonsky, May, & Glenn, 2013; Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006). There is a strong association between NSSI, the future risk of suicide attempts, and the completion of suicide. As such, treating and reducing self-injury among adolescents should be a major aim of researchers and clinicians. Consistent with this aim, the present study seeks to improve the treatment outcomes for adolescents who have reported histories of self-injury. If treatment of NSSI is successful, it is plausible the associated risks for future psychopathology will decrease as well.

NSSI's Functions

Researchers have improved our conceptual understanding of NSSI. Broadly speaking researchers have found self-injury can serve both intrapersonal and interpersonal functions (Klonsky & Glenn, 2009; Nock, 2009; Walsh, 2007; Suyemoto, 1998). The research literature indicates affect regulation, antidissociation, anti-suicide, establishing interpersonal boundaries, interpersonal influence, self-punishment, and sensation seeking can all serve as motivations of self-injury (Klonsky, 2007; Nock, 2009; Nock & Prinstein, 2004, 2005). Consistently, affect regulation is the most often cited function of NSSI (Nock, Prinstein, and Sterba, 2009). The Affect Regulation Model (ARM) of self-harm suggests that as intense emotions become intolerable for the individual, he or she may use self-harm as a coping strategy for regaining a sense of

control over their emotions (Favazza, 1992; Gratz, 2003). While ARM has been strongly supported throughout the literature, it does not explain all occurrences of self-injury (Klonsky & Muehlenkamp, 2007; Laye-Gindhu & Schonert-Reichl, 2005; Niedtfeld et al., 2010). In fact, each self-injurer and every discreet episode of self-injury may have different or even multiple drivers behind them (Nock, 2009; Nock & Prinstein, 2004, 2005).

In expanding on the ARM, Lloyd-Richardson and colleagues proposed a Four-Functions Model of self-harm (Lloyd-Richardson et al., 2009). This model acknowledges the potential positive and negative reinforcement properties of self-harm, as well as the consequences of each function of self-injury (Miller & Brock, 2010). For example, when an adolescent uses the blade from a common household shaving razor to cut themselves on their forearm, they may immediately experience a perceived reduction in their negative emotional state that they were experiencing prior to self-injuring. Subsequently, this may lead to future episodes of self-injury as a means of coping because the youth finds the self-injury briefly reduces their experience of unpleasant feelings. As can be seen from this example, a self-injurious behavior can be negatively reinforcing. NSSI can also lead to increased social support from a peer or a family member, leading to positive reinforcement of self-injurious behaviors. The wanted support and attention from others gains them relief. Part of the insidious nature of self-injury comes from the youths learning to rely on self-injury instead of learning and developing healthier coping strategies to help them regulate their emotions. From a cognitive behavioral perspective, this model helps account for the reinforcement properties at play during self-injury.

Conceptual models described above provide theoretical rationale for using behaviorally based treatments tailored for those with histories of NSSI.

DBT Treatment of NSSI

DBT is a cognitive and behavioral based approach, which has shown success in reducing self-harm among adults (Verheul et al., 2003). The effectiveness of DBT at reducing self-harm behaviors in adults led researchers to adapt DBT for adolescents with histories of self-injury (Rathus & Miller, 2002). According to Linehan (1993a, 1993b), the combination of environmental conditions and genetic vulnerabilities can lead to problems with emotion processing and emotion dysregulation. Linehan's Biosocial Developmental Model of Borderline Personality states that along with problems with emotion regulation, cognitive problems are a part of the development of individuals with Borderline Personality Disorder and NSSI behaviors (Crowell, Beauchaine, & Linehan, 2009; Linehan, 1993a, 1993b). Furthermore, the emotional regulation system develops over time with important changes occurring during childhood and adolescence (Gross, 2007). As such, in order to help individuals with histories of NSSI, treatments needs to be able to address underlying issues with emotional regulation and cognitive processes such as deficits in effective problem solving (Klonsky & Muelenkamp, 2007).

DBT was first designed for adult patients who often experience chronic suicidal thoughts and behaviors (Linehan, 1993a, 1993b). DBT is deeply rooted in cognitive and behavioral therapy theory, mindfulness concepts such as Zen Buddhism, and acceptance-based strategies (Linehan, 1993a, 1993b). DBT includes the concepts of dialectics and validation as well as problem-solving strategies. During DBT treatment, participants

learn five core modules that cover the concepts of Mindfulness, Emotion Regulation, Distress Tolerance, Interpersonal Skills, and Radical Acceptance. Participants review the skills in modules to increase their ability to tolerate distressful life experiences and emotions, increase their ability to self-regulate their emotions, and to improve their interpersonal effectiveness. Typically, DBT includes individual and group skills training. Coaching calls are provided when necessary to promote skill usage during episodes of increased suicidality or self-injury and to limit hospitalizations. Also of note, DBT therapists participate in weekly consultation meetings during DBT, which helps to foster therapist motivation and treatment adherence.

DBT was first adapted for use with adolescents by Rathus and Miller (2002). For adolescents, the typical length of treatment is shortened to 12 to 16 weeks. The treatment material is adjusted so that the language in the handouts is more adolescent-friendly (Miller, Rathus, & Linehan 2007b; Rathus & Miller, 2002). Other notable adaptations include a multi-family skills training group where the adolescent and at least one parent learn the DBT skills together and a new skills called “walking the middle path” that focuses on common dialectical dilemmas that parents and adolescents often encounter (Miller et al., 2007b; Rathus & Miller, 2002). This focus on the parent-adolescent relationship is thought to be a key component of the DBT-A treatment and is consistent with other research showing the important role of parents/caregivers in successful treatment outcomes. Some studies examining family-based therapies have previously found that parental involvement, self-efficacy, and parent-child alliance are directly related to adolescent treatment outcomes (Robinson, Strahan, Girz, Wilson, & Boachie, 2013; Shelef, Diamond, & Liddle, 2005; Robbins et al., 2006).

In examining the literature, there was no evidence-supported treatments (ESTs) designed to specifically treat NSSI among adolescents. However, there is growing evidence to suggest that DBT-A is effective in treating adolescent self-injury problems. Several pre- post-studies utilizing DBT-A have shown improvements in overall functioning, reduced incidence of self-injurious behaviors, and fewer psychiatric hospitalizations (Fleischhaker et al., 2011; James et al., 2008; James et al., 2011). Notably, the first randomized clinical trial was just published showing DBT-A to be more effective than an enhanced treatment as usual group in reducing self-harm and other psychological problems among adolescents (Mehlem et al., 2014). Taken together, this early research points to the effectiveness of DBT-A as a promising approach to treating NSSI.

Adolescent Treatment Dropout

Research has consistently demonstrated that rates of treatment dropout for adolescents are high. In a recent meta-analytic review of the available literature, Haan found rates of reported youth treatment dropout between 28 to 75 percent. The variation in dropout rates can depend largely on study characteristics, including how researchers define dropout (Haan, Boon, Jong, Hoeve, and Vermeiren, 2013). An older study examining treatment dropout found similarly high rates among youth. Kazdin reported 40 to 60 percent of children and adolescents will drop out of treatment (Kazdin, 1996). There are epidemiologic studies that also note high rates of dropout for younger participants from mental health treatment (Edlund, Wang, Berglund, Katz, Lin, & Kessler, 2002). The findings above are a testament to the challenges faced by clinicians

and researchers in trying to keep adolescents in therapy. Adolescents that drop out of treatment may not receive an appropriate dosage of treatment to obtain meaningful benefit from the therapy (Kazdin, Mazurick, and Siegel, 1994; Howard, Kopta, Krause, & Orlinsky, 1986). Specifically, adolescents who drop out of treatment early may not receive the dosage recommended by clinicians and suggested by past research. In one study, Pekarik (1986) found that ending treatment after 2 or 3 sessions of therapy is associated with minimal improvement thereby leading to ongoing problems for the adolescent.

In response to the above issue, efforts have been made to find the best predictors of adolescent treatment dropout. Unfortunately, research has shown that even the most basic of questions, such as how researchers define dropout, influences the findings of studies that assess dropout. For instance, Warnick and colleagues (2012) used three different methods for defining dropout: “therapist opinion”, “dosage of sessions attended”, or “missed last appointment” to describe dropout in the same sample of children and adolescents. The results of the study showed each method resulted in a different reported rate of dropout, 63, 88, and 57 percent respectively. These findings demonstrate just how difficult it is for researchers to measure outcome variables such as dropout rates.

A study by Armbruster and Kazdin (1994) noted that when evaluating youth treatment dropout across treatment studies, no clear profile of those who will leave treatment emerges. Family variables, individual characteristics, social relationships and demographic information have all been reported to be associated with treatment dropout (Kazdin, 1993; Kazdin and Mazurick, 1994; Lock, Couturier, Bryson, & Agras, 2006;

Robbins et al., 2006; Robbins, Turner, Alexander, & Perez, 2003; Warnick, et al., 2012; Wierzbicki and Pekarik, 1993). However, many of these research findings are contradictory or have not been replicated (Haan, et al., 2013). A more specific example of the inconsistency in the dropout research literature is seen in studies that report pretreatment scores for symptom severity. In some past studies, initial symptom severity had been reported to be helpful in identifying those individuals with an increased likelihood of poor outcome (Lambert et al., 2002; Armbruster and Kazdin, 1994). However, in other studies such as Chasson (2008) symptom severity only predicted treatment dropout immediately before dropout but not when measured pretreatment (Chasson, Vincent, & Harris, 2008). While these findings seem to suggest symptom severity may be a good predictor of dropout, other studies have found adolescent pretreatment symptom severity did not predict treatment dropout at all. For example, Chasson cited both an unpublished study by McNamara (2000) and Pina, Silverman, Weems, Kurtines, & Goldman (2003) as examples of studies where symptom severity did not significantly predict treatment dropout. Therefore, more research clearly is needed to help clarify these contradictory findings. Relatedly, the types of symptoms that the client presents with may also be an important consideration in regards to treatment dropout. For instance, adolescents in the SHIELD treatment program have reported interpersonal and intrapersonal problems, emotional dysregulation, and social problems. For this specific group of adolescents, these issues may create barriers that increase an adolescent's risk of dropping out of treatment.

In support of the above noted findings, researchers have also found that different populations tend to respond to treatment at different rates. Individuals with borderline

personality disorder, for instance, have been found to be more likely to respond to treatment slower than individuals with depression (Howard, 1986). This would suggest that adolescents displaying borderline traits like self-injury and problems with emotional lability might require a relatively longer duration of treatment to have a successful outcome. To be more specific, individuals that self-injure may need time to develop skills to treat their underlying problems with emotion regulation. Completion of a full course of a DBT-A may be necessary for adolescents to receive the maximum benefit from the treatment. DBT research studies have alluded to the need for ongoing efforts to keep this high-risk population in treatment (Fleischhaker et al., 2011; James et al., 2014; Woodberry & Popenoe, 2008). Three notable studies using DBT to treat adolescents reported dropout rates ranging from 28 to 38 percent (James et al., 2011; James et al., 2008; Rathus & Miller, 2002). Rates will have to be reduced to ensure more adolescents gain the skills necessary to reduce their self-injury behaviors.

In summary, self-injurers are a high-risk population that needs treatment. Identifying predictors of treatment dropout is a complicated endeavor (Warnick, Gonzalez, Weersing, Scahill, & Woolston, 2012). Unfortunately, there does not seem to be one set of predictor variables that researchers can use for identifying adolescents who will drop out of treatment (Armbruster & Kazdin, 1994). In this regard, it is argued that symptom domains of interpersonal and intrapersonal functioning, as well as social and behavioral problems may help to identify predictors of drop out specific to adolescents who self-harm. Studies examining attrition and treatment drop out suggest it may also be necessary to assess combinations of psychosocial and environmental factors that could together contribute to early treatment dropout (Kazdin, Holland, Crowley, 1997; Kazdin,

Holland, Crowley, & Breton, 1997). Given the broad nature of these factors, the use of multiple informants to ascertain what leads adolescents to leave treatment early may be helpful in reducing drop out rates.

Utilizing Multiple Informants

As stated previously in this literature review, adolescents with histories of self-injury often have co-occurring psychological problems and behavioral issues. Therefore, the assessment of problematic youth behaviors and psychopathology are often gathered from multiple sources. Collecting information about adolescent functioning from the parent's perspective is also done to better grasp the extent and severity of a youth presenting psychosocial problems. This practice is supported by research that has found assessing adolescent functioning from multiple sources may provide additional insights into a youth's psychopathology (De Los Reyes & Kazdin, 2005).

While using multiple informants may provide additional clarity of an adolescent's clinical issues and inform treatment decisions it also has the potential to cloud the clinical picture. Within the research literature it has been acknowledged that often times different informants provide discrepant reports of the youth's functioning when assessing psychopathology (De los Reyes, 2011; De Los Reyes & Kazdin, 2005; Stuart & Jose, 2012). For example, the seminal meta-analytic review by Achenbach, McConaughy, and Howell (1987) noted that there was only poor to modest levels of agreement found between different informants. Other studies have supported Achenbach's finding by noting similarly low levels of rater agreement between youth and other informants (De Los Reyes, Lerner, Thomas, Daruwala, & Goepel, 2013; Grills & Ollendick, 2003). The

noted lack of correlation between informants has raised important research questions about the usefulness of gathering information from multiple sources. These questions include: how much of discrepancies could be measurement error or whose report should be given the most weight when adolescent and another source are not in agreement?

Researchers studying informant discrepancies tend to report that discrepancies are more than measurement error (Achenbach et al., 1987; Grills & Ollendick, 2002; De Los Reyes & Kazdin, 2005; De Los Reyes & Kazdin, 2006; Van Roy, Groholt, Heyerdahl, & Clench-Aas, 2010). Researchers have argued that there are also natural changes in behaviors displayed by youth across settings. Observations can be specific to the settings or situations where the youth's behaviors was observed. Furthermore, informant reports can be dependent upon where/how the youth interacted with the reporter (Collisham, Goodman, Ford, Rabe-Hesketh, & Pickles, 2009). It is plausible that each informant's account is contingent upon the unique pieces of information observed (Ende, Verhulst, and Tiemeier, 2012; De Los Reyes et al., 2013). Ende and colleagues (2012) evaluated the externalizing and internalizing problems of 1,875 individuals by some 12,059 informant pairs. Agreement or divergence between informants was most closely related to the types of informant pairs versus subject problem type or age. For example, a parent's account would most likely be consistent with another parent versus being compared to a report from their child or that of a teacher. Additionally, another study examining discrepancies between adolescents and their parents found adolescents reported more symptoms than their parents, but that their parents were savvier at indicating the potential long-term impacts of the adolescent's problems (Van Roy, Groholt, Heyerdahl, & Clench-Aas, 2010). These findings support the notion that each

informant may see a portion of the adolescents functioning that subsequently can be relevant to the treatment of youth. Given the complex nature of the behaviors observed by SHIELD participants, it would likely be imprudent to rely solely on adolescent reports when trying to predict their treatment outcomes. Since adolescents undergoing DBT-A treatment often have a host of behavioral and emotional problems, parent reports may provide additional insights as to the severity of the adolescents' pathology and behaviors. The present study seeks to use the information obtained from both youth and their parents to identify predictors of those teens most likely to leave treatment before the completion of a DBT-A treatment program.

Utilization of Outcome Measures

In many respects, the current outcome research is part of a broader effort by mental health professionals and researchers to increase the effectiveness of treatments in real world settings. Researchers and clinicians have made concerted efforts to improve the treatment outcomes of youth receiving mental health services. This necessitates the use of ongoing assessment measures to track changes across treatment. Countries including the United States and the United Kingdom have begun to establish governmental policies to promote the routine use of outcome measures to improve the overall quality of therapeutic services. For example, Child and Adolescent Mental Health Services (CAMHS) in Britain require the ongoing feedback and evaluation of clinical work to improve outcomes in therapy (Batty et al., 2013). When used appropriately, routine outcome measures can significantly increase the duration of treatment and improve outcomes for clients most at risk for treatment failure (Lambert et al., 2002;

Lambert, Hansen, & Finch, 2001). This is especially true when the therapist is given regular feedback in regards to the client's functioning throughout treatment (Whipple, Lambert, Vermeersch, Smart, Nielsen, & Hawkins, 2003). The YOQ is a promising outcome measure that has been already widely used with adolescent populations (Burlingame et al., 2005; Ridge, Warren, Burlingame, Wells & Tumblin, 2009). However, while it has been utilized successfully to predict cases at risk for negative outcomes via tracking of week to week changes in client scores across sessions, to our knowledge, researchers have yet to thoroughly assess its potential value as a predictor of dropout based on pretreatment scores of youth entering treatment for self-injury. If adolescents in the SHIELD program most at risk for dropout can be identified at the beginning of treatment, preventive measures can be taken to improve the adolescent's chances of success and subsequent outcomes.

The above findings suggest more patient-focused research is needed in order to fully understand the issue of treatment dropout. If it can be shown that certain pretreatment factors are predictive of dropout, clinicians can provide additional services and support aimed at addressing these factors. It is thus hoped that by using multiple informants, such as an adolescent's self-report and parent/caregiver report, further insight can be gleaned. In this respect, the following hypotheses will be addressed:

- Hypothesis 1: SHIELD program dropouts will have significantly higher adolescent reported Total YOQ scores as compared to SHIELD graduates.
- Hypothesis 2: SHIELD program dropouts will have significantly higher parent/caregiver reported Total YOQ scores as compared to SHIELD graduates.

- Hypothesis 3: Adolescent and parent pretreatment scores (Interpersonal, Intrapersonal, Somatic, Social, Behavioral, and Critical Items) will be predictive of treatment dropout (graduated vs. dropout).

CHAPTER 3

METHODS

Participants

Data for the current study was part of a larger de-identified archival database collected during the six years the Loma Linda University Behavior Medicine Center SHIELD treatment program has been in existence. SHIELD is an intensive outpatient (IOP) treatment program for adolescents between the ages of 12-18. During their intake interview, these adolescents often report experiencing a significant degree of emotional dysregulation, behavioral problems, and self-harming behaviors. Adolescents who completed the SHIELD program as of December 31, 2014 were included in the study. Additional inclusion criteria required each subject have an initial pretreatment and final session post-treatment self-report and parent/caregiver Youth-Outcome Questionnaire. Of the 436 subjects included in the database, 189 adolescents met the inclusion criteria and were included in the study.

Treatment Protocol

The SHIELD program uses a manualized adapted version of DBT-A, which includes 6 hours of weekly treatment over the course of 2 sessions consisting of (1) a multifamily skills training group, (2) an individual therapy session, and (3) a once a week parent and adolescent peer group. In addition, participants receive family therapy sessions as needed to address issues related to family problems and the treatment team participates in a consultation team meeting to address ongoing treatment issues. Adaptions to the standard use of DBT-A include not having a pretreatment or treatment

commitment stage, the non-use of coaching calls during non-treatment hours, and the integration of music and art into a once a week separate peer group. Parents also attend a weekly parent education group. SHIELD participants were considered to have graduated the treatment program if (1) the participant finished a full 16 weeks of the treatment or (2) if the treatment team judged the participant had met their treatment goals. The latter criterion was limited to some cases where youth left treatment a few weeks early if they met said criteria. In all other situations where the participants did not complete the full treatment they were considered dropouts.

Measures

The Youth Outcome Questionnaire 2.0 S-R (YOQ-2.0 SR)

The YOQ-2.0 SR was used for analysis in this study. The YOQ 2.0 SR contains 64-items on a 5-point-Likert scale that measures treatment progress for children and adolescents (Burlingame et al., 2005; Burlingame, Wells, Lambert, & Cox, 1996; Wells, Burlingame, & Rose, 2003; Wells, Burlingame, Lambert, Hoag, & Hope, 1996). It should be noted the publisher clearly states this measure is not a diagnostic instrument. The YOQ is reported to be appropriate for use with youth ranging from 4 to 18 years of age. Participants in the SHIELD program completed either a paper version YOQ or electronically completed the measure on a Personal Digital Assistant (PDA) using the OQ Analyst software. The YOQ is reported to have good reliability and validity as a screening instrument (Burlingame et al., 2005; Burlingame et al., 2004; Ridge et al., 2009). A sample of 1199 children and adolescents from inpatient, outpatient, and community populations were used in the norming of the YOQ. Differences between

clinical and non-clinical populations have been calculated giving cutoff scores. Reliability of the YOQ was estimated to be .97 across the three sample populations. Construct validity of the YOQ was assessed comparing sample means between clinical and nonclinical populations and significant differences were found (Burlingame et. al., 1996). The YOQ places emphasis on identifying observations of behavior change as opposed to merely measuring features of psychopathology (Burlingame et al., 1996). The subscales of the YOQ assesses intrapersonal distress, somatic issues, interpersonal relations, social problems, behavioral dysfunction, and a set of critical items. The critical items cover such issues as suicidality or extra perceptual experiences (Burlingame, Well, Lambert, & Cox, 2004; Burlingame et al., 1996; Ridge et al., 2009). Clinical Cutoff scores are as follows: Intrapersonal Distress = 17, Somatic = 6, Interpersonal Relations = 3, Social Problems = 3, Behavioral Dysfunction = 11, Critical Items = 6. The subscale cut off scores can be subsequently summed to give a total score reflecting a clinical overall distress of the child or adolescent. A cutoff total score of 47 or above indicates clinically significant distress. A Reliable Change Index (RCI) score of 18 is indicative of meaningful change during treatment.

The Youth Outcome Questionnaire 2.01 (YOQ-2.01)

The YOQ-2.01 is a parent or guardian report version of the YOQ used in this study. This measure also assesses youth functioning with 64 items, on a 5-point Likert scale that covers the same domains of functioning as the youth self-report version (Burlingame et al., 2001). Parents complete the YOQ-2.01 as part of a pretreatment intake process and weekly throughout the course of their youth's treatment in the

SHIELD program. For the YOQ-2.01 a Reliable Change Score (RCI) of 13 is considered meaningful (Burlingame et al., 2001). Clinical cut-offs for the YOQ parent report subscale scores are as follows: Intrapersonal Distress = 16, Somatic scale = 5, Interpersonal Relations scale = 4, Social Problems = 3, Behavioral Dysfunction scale = 12, Critical Items scale = 5, and a summed total score greater than equal to 46 falls in the clinical range (Burlingame et al., 2005).

Other measures were utilized during the initial pretreatment assessment and at the exit from treatment, but these measures are not part of the analysis for the present study. These measures included: The Behavior Assessment Systems for Children (BASC-2), Parent Ratings Scales- Adolescent (PRS-A), Self-Report of Personality-Adolescent (SRP-A), and the Parent-Child Relationship Questionnaire-Child and Adolescent (PRQ-CA).

Statistical Analyses

Demographic descriptive information is provided under the results section. Preliminary analysis of the data revealed assumptions of normality and homogeneity of variance were generally met Power analysis using G*Power revealed a sample size of 85 was needed to find a large effect size for the analyses used in this study. In order to determine if graduates did better than dropouts across treatment, two 2x2 mixed ANOVAs were conducted using the YOQ total self-report and YOQ total parent/caregiver scores as the between group outcome variables. The YOQ total score was selected due to it being highly sensitive to change across sessions. Consequently, if adolescents who dropped out improved despite fewer sessions, the YOQ total score

would reflect this change. To answer the third hypothesis of the study, Logistical Regression analysis was conducted to determine whether pretreatment YOQ subtest scores (self-report and parent/caregiver report) predicted reason for discharge (treatment graduate or treatment dropout). A total of 12 independent variables were considered for the analysis. However, preliminary analysis indicated only one significant correlation between reason for discharge and adolescent Intrapersonal Distress $r(189) = .020, p < .05$. All other Pearson correlations between YOQ subscales and reason for discharge were non-significant and thus excluded from the analysis (see Table 1).

Table 1
Summary of Intercorrelations between Youth Self-Report and Parent Report YOQ Subscales Raw Scores and the Reason for Discharge

	Reason for Discharge
Youth Report	
Interpersonal Relations	.030
Intrapersonal Distress	-.169*
Somatic	.016
Social Problems	.115
Behavioral Dysfunction	-.067
Critical Items	-.047
Parent Report	
Interpersonal Relations	.007
Intrapersonal Distress	-.087
Somatic	.072
Behavioral Dysfunction	-.024
Critical Items	.033

* $p \leq .05$.

CHAPTER 4

RESULTS

Patient Demographics

Of the 436 participants who had previously entered SHIELD program, there were 189 participants who met inclusion criteria for this study. Within this sample, 156 (82.5%) of participants successfully graduated from the treatment program and 33 youth (17.5%) dropped out prior to completion for various reasons. A total of 28 participants (14.8%) were male and 161 (85.2%) of participants were female. Participants had a mean age of 14.87 years ($SD = 1.37$). The ethnic makeup of the sample was 119 (63%) Caucasians, 35 (18.5%) Hispanics, 13 (6.9 %) African Americans, 5 (2.6%) Asians, and 17 (9%) individuals who endorsed “Other”. Individuals who graduated the treatment program on average attended 30.24 ($SD = 4.33$) days of treatment whereas participants who dropped out of treatment only attended an average of 15.33 ($SD = 7.90$) days of treatment. The self-report and parent/caregiver pretreatment mean scores are also reflective of the severe nature of this clinical sample as all YOQ subscales scores were reported to be well above that clinical cutoff (see Table 2).

Table 2
Demographic Information on the Overall Group of Participants (N = 189)

Demographic Information	Overall N (%)	
Gender		
Male	28	(14.8)
Female	161	(85.2)
Ethnicity		
Caucasian	119	(63.0)
African-American	13	(6.9)
Hispanic	35	(18.5)
Asian	5	(2.6)
Other	17	(9.0)
Reason for Discharge		
Graduated	156	(82.5)
Dropout	33	(17.5)
	<i>M</i>	<i>(SD)</i>
Age	14.9	(1.4)
Number of treatment days		
Graduate	30.2	(4.3)
Dropout	15.3	(7.9)
YOQ Self-Report Pretreatment Subscales		
Interpersonal Relations	7.89	(5.85)
Intrapersonal Distress	37.40	(12.83)
Somatic	11.40	(5.84)
Social Problems	5.04	(5.08)
Behavioral Dysfunction	16.90	(6.88)
Critical Items	14.27	(6.81)
YOQ Parent Pretreatment Subscales		
Interpersonal Relations	8.80	(6.93)
Intrapersonal Distress	31.83	(11.44)
Somatic	9.13	(4.99)
Social Problems	5.06	(4.72)
Behavioral Dysfunction	16.37	(8.33)
Critical Items	10.54	(5.07)
		Clinical Cutoff

		3
		17
		6
		3
		11
		6
		4
		16
		5
		3
		12
		5

Mixed ANOVA Results

DBT treatment likely contributes to an adolescent's overall level of distress, but that effect might differ if the youth completed the treatment program as recommended or dropped out prematurely. A 2x2 mixed ANOVA was conducted to assess the impact of

treatment discharge status (graduate or dropout) on participants' scores on the self-report YOQ total score, across two time periods (pre-intervention and last session attended). Preliminary analysis indicated no significant differences in self-report YOQ pretreatment scores among the graduates and dropouts. For the primary analysis there was a significant main effect for pre-post-adolescent self-report YOQ scores, $F(1, 187) = 49.435, p < .001$, partial $\eta^2 = .209$ suggesting that when discharge status is not considered, adolescents report meaningful and significant changes in their YOQ scores from initial pre-treatment to their last session attended. In regards to reason for discharge, there was no significant main effect $F(1, 187) = 1.434, p = .233$, partial $\eta^2 = .008$ indicating no significant difference in post-treatment YOQ distress ratings among graduates and dropouts. However, there was a significant interaction between discharge status and time, $F(1, 187) = 14.103, p < .001$, partial $\eta^2 = .070$ suggesting that adolescents' overall distress, as measured by the YOQ, had a different effect across treatment in graduates and dropouts (see Figure 1).

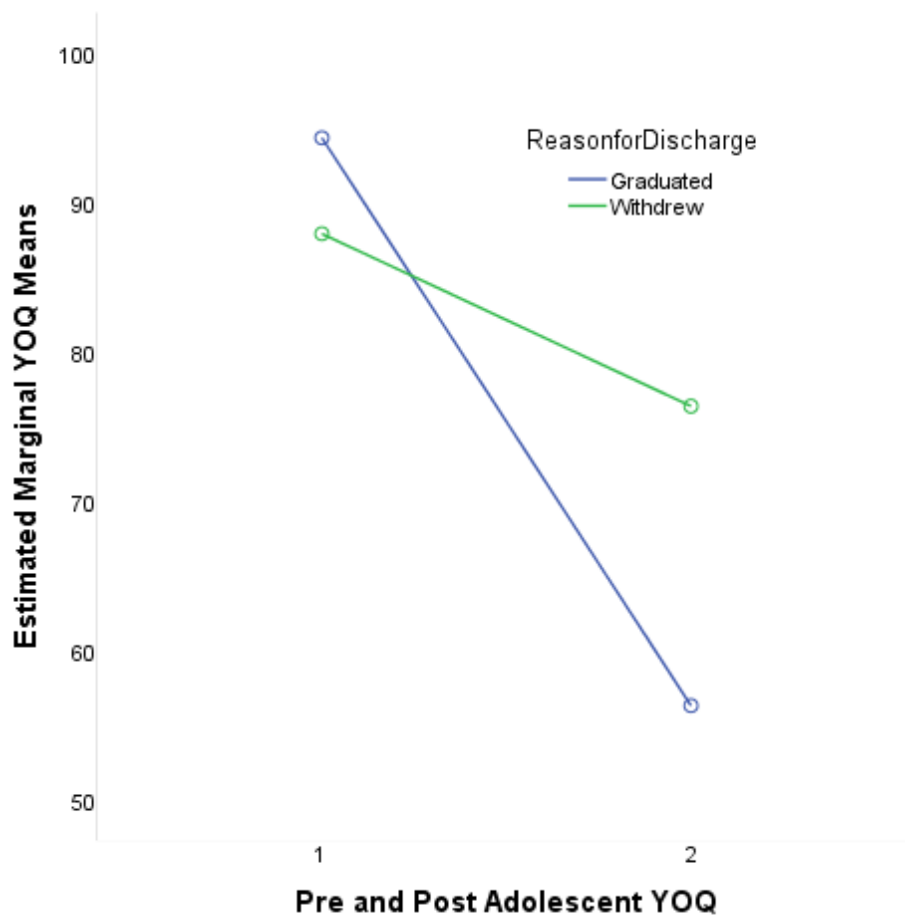


Figure 1. Interaction Between Reason for Discharge and Adolescent YOQ Scores Across Time

An examination of the means indicates a pretreatment score for graduates of 94.33 ($SD = 2.66$). These scores on average fell 38 points over the course of treatment to a mean of 56.31 ($SD = 2.92$) at post-treatment. This finding indicates both a statistically and clinically reliable level of change across the course of treatment. Adolescents who dropped out at some point in treatment had a mean pretreatment score of 87.91 ($SD = 5.80$) and a post-treatment mean of 76.36 ($SD = 6.35$) at the point of dropout. Although statistical significance was obtained, a decrease of only 11.55 points was observed which

is below the 18 or more reliable change index needed for clinically reliable change on the YOQ. As such, youth who graduated from treatment had a clinically significantly larger drop in their overall mean YOQ scores across time as compared to their peers who dropped out of treatment early (see Table 3). It was notable that based on adolescent reports at post-treatment, regardless of the reason for discharge, scores were by and large still above the YOQ clinical cutoff of 47 on the self-report version of the YOQ.

Table 3
Mean and SD Self-Report YOQ Test Scores for Graduates and Dropouts

Program Status	YOQ Pretreatment		YOQ Post-treatment	
	Mean	SD	Mean	SD
Graduated	94.33	2.66	56.31	2.92
Dropout	87.91	5.80	76.36	6.35

Note. The mean adolescent self-report YOQ score has a clinical cut-off of 47 and a reliable change index of 18

A 2x2 mixed ANOVA was also conducted to assess the impact of treatment discharge status (graduate or dropout) on participants' parent/caregiver-report total YOQ scores, across two time periods (pre-intervention and last session attended). It should be noted that preliminary analysis indicated no significant differences in parent/caregiver YOQ pretreatment scores among the graduates and dropouts. In conducting the primary analysis, there was a significant main effect of Parent Pre-Post YOQ, $F(1, 187) = 39.133$, $p < .001$ partial $\eta^2 = .173$. Without considering participants' reason for discharge, parent/caregiver rated YOQ scores changed significantly from the initial pretreatment assessment to the last report a parent/caregiver gave of their adolescent's functioning. In regards to reason for discharge, there was also a significant main effect $F(1, 187) = 5.151$, $p < .05$, partial $\eta^2 = .024$ indicating that parents/caregivers reported that graduates had

significantly lower post-treatment YOQ distress scores as compared to adolescents who dropped out. A significant interaction between discharge status and time based on parent/caregiver reports was also indicated, $F(1,187) = 21.014, p < .001$, partial $\eta^2 = .101$. As shown in Figure 2, parent/caregiver YOQ distress ratings of their adolescents suggests that graduates received significantly lower scores across treatment than those youth who dropped out of treatment.

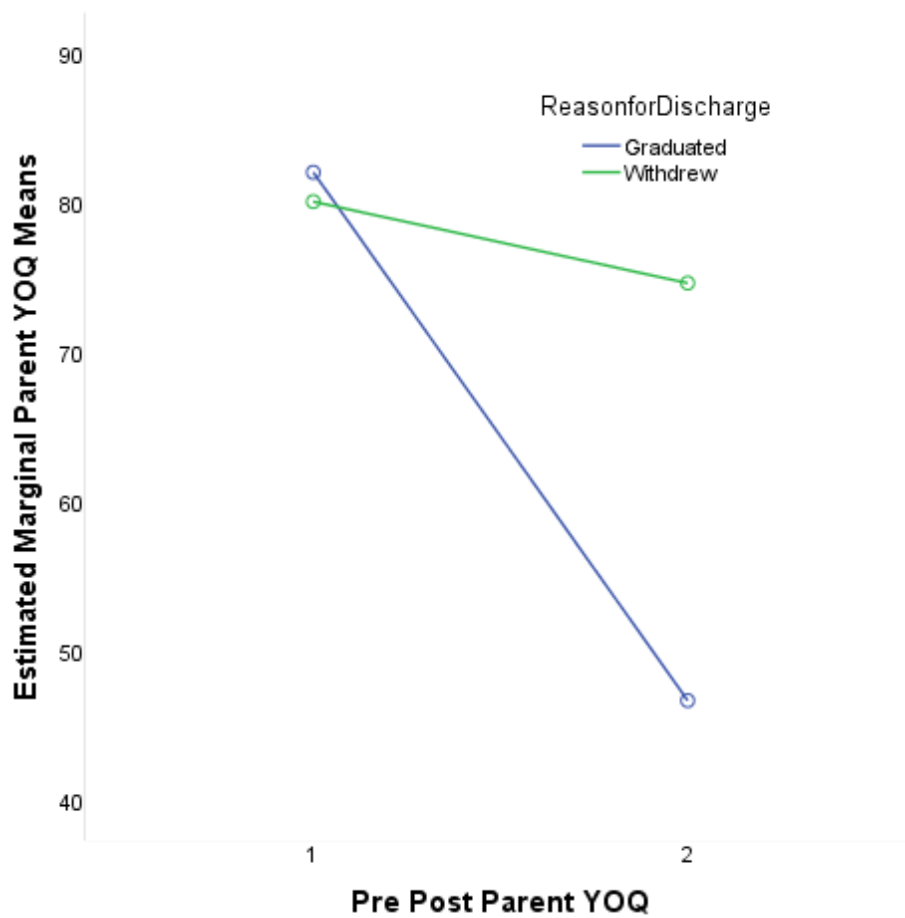


Figure 2. Interaction Between the Reason for Discharge and Parent Reported YOQ Scores Across Time

An examination of the descriptive data indicates that parents/caregivers of graduates reported a YOQ mean score of 82.03 ($SD = 2.75$) at pretreatment and a mean score of 46.65 ($SD = 2.76$) at posttreatment. This finding represents a 35 point drop in YOQ distress scores over the course of treatment and suggests both a statistically significant drop in overall distress and also a clinically reliable change based on the required drop in score of 13 or more on the parent/caregiver YOQ. Interestingly, parents reported an average drop for graduates that fell very close to the YOQ clinical cutoff

score of 46 at discharge. This indicates that parents reported even greater improvement by the end of treatment for graduates than the adolescents reported. For adolescents who eventually dropped out of treatment, parents reported a mean pretreatment score of 80.06 ($SD = 5.98$) and a mean post-treatment score of 74.61 ($SD = 5.99$) at the point of dropout. According to parent reports, youth who dropped out of treatment did not have a clinically reliable drop in their level of distress. This finding is consistent with youth reports for dropout cases. Parent reports also indicated that youth who graduated from treatment had greater improvement in overall distress compared to dropouts cases (see Table 4).

Table 4
Mean and SD Parent/Caregiver Report YOQ Test Scores for Graduates and Dropouts

Program Status	<u>YOQ Pretreatment</u>		<u>YOQ Post-treatment</u>	
	Mean	<i>SD</i>	Mean	<i>SD</i>
Graduated	82.03	2.75	46.65	2.76
Dropout	80.06	5.98	74.61	5.99

Note. The mean adolescent self-report YOQ score has a clinical cut-off of 13 and a reliable change index of 46.

Predictors of Treatment Dropout

A logistic regression analysis was performed to predict discharge status of adolescents attending a DBT-A treatment for self-injury using adolescent pre-treatment self-report YOQ subscales and pretreatment parent/caregiver YOQ subscales as predictors. The preliminary analysis of the data indicated that only youth reported Intrapersonal Distress scale was significantly correlated with adolescents' reason for

discharge. As such, Intrapersonal Distress reported by the youth was the only subscale entered into the regression model. The regression model was statistically significant indicating youth reported intrapersonal distress reliably distinguished between graduates and those who dropped out of the treatment program (Chi-square = 5.195, $p < .05$ with $df = 1$). Nagelkerke's $R^2 = .045$ indicated a small but significant relationship between prediction and grouping (see Table 5). The model suggests 4.5 percent of the early discharges from treatment may be explained by the youths' reported level of intrapersonal distress when they entered treatment. The odds of an adolescent withdrawing are lowered by 3.3 percent for every point increase of adolescent self-reported Intrapersonal Distress. Individuals with higher self-reported levels of Intrapersonal Distress at pretreatment are more likely to stay in the treatment than those with lower Intrapersonal Distress scores.

Table 5
Logistic Regression of Intrapersonal Distress YOQ Subscale on Reason for Discharge from Treatment

Adolescent Pre-Treatment YOQ Subscales				
	B	S.E.	Wald	Exp (B)
Intrapersonal Distress*	-.033	.015	5.179	.967

Model $\chi^2 = 5.195^*$

$R^2 = .031$

Nagelkerke $R^2 = .045$

Note. The dependent variable in the analysis is reason for discharge.

Coding was graduate = 0 and dropout = 1.

* $p < .05$

CHAPTER 5

DISCUSSION

Improving dropout rates for youth who participate in the SHIELD treatment program is critical given the serious and even life-threatening nature of their behavioral health problems. The present study started by evaluating whether adolescents that stayed in the program for a full course of treatment actually improved more than their peers who dropped out of treatment. The results indicated that the treatment was effective given that adolescents who dropped out of the program reported less improvement in their overall levels of distress than graduates. Furthermore, the scores of those who graduated from the treatment program approached levels of distress seen in non-clinical samples thus suggesting the treatment is effective in reducing overall distress. This finding is consistent with past studies of DBT-A treatment outcomes (Fleischhaker et al., 2011; James et al., 2008; James et al., 2011). The results of the study also suggest completing the full treatment program leads to better outcomes. Past research has also found that an appropriate dose of treatment is a vital part of making treatments effective (Kazdin et al., 1994; Howard et al., 1986; Pekarik, 1991; Pekarik, 1986). Of note, the aforementioned finding held true regardless of informant type (adolescents or parents). Consequently, leaving treatment early can be viewed as a negative outcome for youths in the SHIELD program.

As noted previously, dropout rates for SHIELD participants have been high with roughly 43 percent leaving treatment early (James et al., 2008; James et al., 2011). The program's dropout rate is consistent with rates reported in several other studies of adolescents (Kazdin, 1996; Kazdin & Mazurick, 1994; Kazdin, Mazurick, & Redlich,

1993). To address the issue of treatment dropout, clinicians need to be able to identify participants most at risk of leaving treatment early so that additional interventions can be implemented to retain them in treatment. The present study attempted to identify pretreatment predictors of dropout in the SHIELD program. Among the reasons reducing dropout is important is that it appears that adolescents need time to learn and gain mastery of all the DBT material (Miller et al., 2007b; Rathus & Miller, 2002).

The results of the study identified a sole predictor of treatment dropout. A youth's own account of their pretreatment intrapersonal distress was modestly predictive of their reason for discharge from the SHIELD program. More specifically, adolescents reporting higher levels of intrapersonal distress at pretreatment were actually more likely to stay in treatment than those with lower levels of reported intrapersonal distress. This finding may seem counter-intuitive given that studies have found high symptom severity is sometimes associated with poor treatment outcomes (Armbruster and Kazdin, 1994; Kley, Heinrichs, Bender, & Tuschen-Caffier, 2012; Lambert et al., 2002). It is plausible that those adolescents who reported experiencing less intrapersonal distress do not see the benefit of staying in treatment. It has been noted that the SHIELD program does not have pretreatment commitment stage that is typically found in DBT treatment programs (Linehan, 1993a, 1993b; Miller et al., 2007b; Rathus & Miller, 2002). A pretreatment process often includes strategies aimed at gaining commitment to treatment from the individual when entering a DBT program (Linehan, 1993a, 1993b; MacPherson, Cheavens, Fristad, 2013). The lack of a pretreatment procedures in SHIELD program may contribute to its overall dropout rate.

There are additional explanations for why individuals with lower perceived interpersonal distress would dropout of treatment. For instance, adolescents who report experiencing less intrapersonal distress may not be fully aware of the possible long term benefits of a full course of treatment. Yet another possible explanation is those adolescents who say they are experiencing less intrapersonal distress may be achieving their lowered levels of distress through the use of maladaptive coping strategies, including self-harming behaviors. It is commonly believed that self-injurers may perceive temporary relief of negative affect after self-injuring (Klonsky & Glenn, 2009; Nock, 2009; Nock & Prinstein, 2004). Furthermore, affect regulation is often the primary reason cited for self-injuring (Nock, Prinstein, & Sterba, 2009; Nock, 2009; Klonsky, 2007; Nock & Prinstein, 2005; Nock & Prinstein, 2004). Those in the program who are actively self-injuring during treatment may feel better on the inside due to affect regulation via their self-injury. Consequently, youths may be more reluctant than their peers to stay in the treatment program to learn alternatives to self-harming because they feel the self-injury meets their affect regulation needs. This bears resemblance to alcoholics deciding not to go back to treatment because of their perceived benefits or relief from continued alcohol consumption. Alternatively, individuals with higher levels of intrapersonal distress may be more likely to stay in treatment because their distress increases motivation to learn healthier coping skills. Specific to the SHIELD program, the distress participants experience internally may provide them with a rationale for continuing such a lengthy treatment program. Until the SHIELD program adopts the pretreatment phase that is normally part of a DBT treatment program, staff should consider spending more time providing information on the benefits of completing a full course of treatment to

adolescents and their parents. This approach may help mitigate future dropout. Based on the present findings, this is especially important for adolescents reporting lower pretreatment levels of intrapersonal distress.

The present study takes into account the critical role parents play in their adolescent's lives. Consequently, another aim of this study was to examine whether parent reports help identify predictors of early adolescent dropout from the SHIELD treatment program. Previously, researchers have noted that using multiple informants may provide additional insights into youth functioning and outcomes (De Los Reyes & Kazdin, 2005). Some researchers have even suggested that parents may be better at recognizing the long-term consequences of a youth's social and emotional problems (Van Roy, Groholt, Heyerdahl, and Clench-Aas, 2010). Given that parents also affect factors associated with dropout, such as their youth's ability to make it to treatment appointments, it was thought that their reports would also help in predicting youths' reason for discharge. Moreover, parents of SHIELD program participants also play an active role in the treatment process. Given all these reasons, the present study anticipated that parent reports would be good predictors of adolescent treatment dropout. However, parent reports on the subscales of the YOQ did not distinguish those adolescents who would eventually dropout of treatment from graduates. Although this finding is surprising, it is consistent with past research that has reported ascertaining predictors of dropout can be a difficult and complex process (Haan, 2013; Kazdin, 1994). One possible reason that parents in the present study may not have been able to predict their youth's reason for discharge is their difficulty in grasping their adolescent's struggle with psychological and emotional problems. Many parents have come into the treatment

program asking such questions as: what is going on with their teen, why would their teen want to harm themselves or why won't their child just stop self-harming? These questions convey the distress and struggle parents experience when they discover their adolescents' self-harming behaviors. The parent's statements may also demonstrate their inability to provide validation and the desired support for teens that are struggling emotionally and behaviorally (Miller, Rathus, Linehan, 2007b; Linehan, 1993a, 1993b). Conceivably, parents of self-injurers cannot predict factors related to emotional and behavioral problems that they do not fully understand. Parents may see their teen is struggling with emotional and behavioral problems but may not necessarily understand or be aware of their adolescent's subjective and often internal distress.

The present study used the YOQ to assess differences between treatment graduates and dropouts. This was done at two time points, their pretreatment report and their last session attended. A youth's reason for discharge (graduation from the treatment program versus early dropout) was hypothesized to have an effect on the adolescent reported YOQ scores. Despite having similar pretreatment scores, youth graduating from the SHIELD program reported a much larger average drop in YOQ scores from their initial assessment to their last report. As such, it appears that staying for the entire duration of the treatment leads to better outcomes for participants. This finding is supportive of the overall effectiveness of the treatment program. While on average most youths at their last session were still experiencing a level of distress above the clinical cutoff, program graduates had scores that were significantly and reliably lower than those who dropped out from treatment. Given the above-noted finding that even graduates report levels of distress above the clinical cutoff, it is appropriate that the SHIELD

program provides referrals for additional therapy after the treatment is completed, regardless of whether the youth graduates from the program. Step-down treatment is both necessary and warranted for a majority of the youth who leave the program.

Individuals with lower self-reported intrapersonal distress account for 4.5 percent of those who are likely to drop out of the treatment, which is not the most impressive statistic. However, this may still have clinical relevance and be very important to those future SHIELD participants who are identified early as at risk for dropout. Today, SHIELD clinicians have an additional piece of information that may help them to improve treatment outcomes for adolescents in the program. Participants reporting comparatively lower levels of interpersonal distress can be provided with additional psycho-education and interventions that may increase the likelihood they will stay for a full course of the treatment. Moving forward, if a youth in the treatment program initially reports a lower level of intrapersonal distress or if they display a slower rate of change as measured by their YOQ scores, clinicians will be alerted that this may indicate a greater likelihood the youth will drop out from the treatment program.

In terms of clinical implications, the findings of the present study indicate that within this population of adolescents with histories of self-injury, completing a full course of SHIELD treatment is reliably more beneficial than terminating the treatment early. Communicating these findings to adolescents and their parents may be one strategy that helps reduce dropout rates going forward. Although youth with lower levels of intrapersonal distress may report feeling better than some of their peers who report high levels of distress, they may still be at risk for treatment failure. In other words, clinicians, parents, and youth need to be aware that decreased symptom severity does not always

mean decreased risk for negative outcomes. Educating parents, adolescents, and clinicians about these nuances will be important moving forward. Pretreatment protocols can potentially impact dropout rates by creating greater buy-in to a full course of treatment.

Limitations

Results of the present study should be interpreted with caution considering the numerous limitations of the research design of the study. Notable limitations are discussed in detail below. The use of an archival data set from an active treatment program prevented us from implementing the type of control conditions that are standard in randomized clinical control trials. The treatment program also does not have standardized training protocols for individuals providing the pretreatment and weekly assessment measures to the youth and their caregivers. This may impact the reliability of the findings as the motivation of the respondents can be affected by how assessment measures are presented. As such, moving forward the SHIELD program should have more stringent guidelines for those administering the assessment measures to the participants.

One issue that limits the generalizability of the present findings is the criteria for admittance into the SHIELD program. Merely reporting a history of self-injury at some point in their lives was sufficient for some adolescents to be allowed admittance into the treatment program. This is problematic because some individuals in the treatment program had only self-harmed once or twice while other participants had many incidences of self-injury and/or they were actively self-harming during their time in

treatment. Moreover, the severity of self-harming behaviors is potentially confounding. There were also some participants who had never attempted suicide while other participants had one or more attempts. A related issue is the dataset does not have an accurate accounting of youth self-injury episodes across the course of treatment. Rates of self-injury during treatment may be a potential predictor of an adolescent's reason for dropout. It may also be associated with a youth's level of intrapersonal distress, the sole significant predictor of dropout found in this study. Future research in the SHIELD program may want to assess more thoroughly the rates of self-injury.

Another significant limitation is the size of the sample used in the study. Because of the exclusion criteria used in this study and an inability to get many individuals who dropped out to complete exit assessments, less than half of all participants who have participated in the SHIELD program were included in the study. In order to answer the research questions it was necessary for adolescents to have a completed YOQ at entrance into the treatment program as well as at exit from the program, regardless of their reason for discharge. It was also necessary for them to have pre and post scores recorded from their parent/caregivers. These necessary criteria further limited the sample size and thus reduced the power to find significant results. There could also be meaningful differences between youth who dropped out and completed exit assessments and those who left without completing them. Another potential confound of this study was the large discrepancy between the sample sizes for the group of participants who graduated from the treatment program ($n = 156$) compared to those who dropped out from treatment ($n = 33$).

It is also important to note that this study relied heavily on self-report and parent/caregiver report measures, which can limit the inferences that can be made from the findings. Additionally, some research has noted that adolescents may be more likely to inflate their level of distress, reporting more severe distress on measures of psychosocial functioning than other age groups would. This would negatively affect the reliability and validity of the results. Careless responding or even intentional false responding may also negatively influence results of adolescent's self-reports (Fan, et al., 2006). A tendency of youth or parents to want to appear as if they are doing well, *response bias*, is always a concern when using self-report measures.

Future Research

Considering the length of the SHIELD program and the modular nature of the treatment, it may be especially important for teens to receive a full course of the treatment. Completing the entire treatment may also allow them to gain better mastery of all the skills available for reducing their self-harming behaviors. Future research needs to verify the validity of the present finding that youth reported Intrapersonal Distress scores can predict the reason for discharge. More specifically, it is necessary to confirm that those youth reporting lower levels of intrapersonal distress are more likely to dropout compared to those reporting higher intrapersonal distress. Clinicians can then see if treatment interventions lead to reductions in SHIELD program dropout rates for the participants with lower levels of intrapersonal distress. For example, based on the findings of this study, youth may be more likely to stay in treatment if they receive additional psycho-education on the potential benefits of completing a full course of

treatment. There are many possible interventions that could potentially help reduce dropout rates including: psycho-education, coaching, and parent education.

Throughout the literature, many individual, family, and environmental factors have been examined which can affect adolescent treatment dropout (Edlund et al., 2002; Haan, 2013). However, with the large variation in symptom presentations of youth in treatment, perhaps it would be best if future research of dropout predictors were more population specific. Given the large role relationships can have in the SHIELD programs treatment, Adolescent-Therapist Alliance, Parent-Therapist Alliance, and Parent-Adolescent Alliance can all be evaluated as predictors of dropout from the SHIELD program. These alliances have been found to affect outcomes in previous research (Robinson et al., 2013; Shelef et al., 2005; Robbins et al., 2006). Factors including transportation costs for attending two treatment days per week may affect dropout rates as well. Some past participants in the SHIELD program have driven significant distance to receive the treatment. However, distance from the facility has not been measured to see if graduates tend to live close to the treatment facility compared to adolescents who drop out. The research team should consider adding a question about mileage from the treatment facility to the initial pretreatment assessment. Additionally, the program requires a commitment of 6 hours per week. It is plausible the duration of the program leads to dropouts for some participants. Families have many commitments, possibly including childcare for any additional children they have that are not participating in the treatment. Collecting information on these two factors would not require much additional effort on the part of the research team but has the potential to help us gain additional understanding of factors that contribute to the high SHIELD program dropout rates.

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