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Implementation Support: Improving Transportability of Evidence-Based Treatments from Laboratories to Schools

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Implementation Support: Improving Transportability of Evidence-Based Treatments from Laboratories to Schools

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Implementation Support: Improving Transportability of Evidence-Based Treatments from Laboratories to Schools

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Despite the proven benefits of evidence- based practices (EBTs) demonstrated in outcome research trials, their effectiveness decreases when transported to usual care (UC) settings. Researchers posit that implementation support strategies may provide a mechanism to improve EBT treatment delivery and improve their fit within complex settings such as schools. Knowledge of specific implementation modalities leading to successful EBT delivery in UC remains in early stages of research. The majority of youth with mental health disorders receive services in schools, yet these settings often have fewer specialty clinicians who can provide effective mental health care. Therefore, understanding implementation support in educational contexts is crucial to meet the emotional, behavioral, and academic needs of youth. This study examines differential implementation support for a group-based CBT intervention focused on adolescents at-risk for depression. School-based clinicians will be assigned to 1 of 2 conditions: didactic training and manual only, or didactic training, manual, weekly consultation, and weekly fidelity monitoring feedback. The primary outcomes include treatment fidelity, depressive symptoms, and academic performance. It is hypothesized that additional implementation support will increase fidelity and subsequently client outcomes. Finally,

it is expected that fidelity will correlate with client outcomes. These results suggest that implementation support strategies may be both beneficial throughout treatment, and they may also help improve effectiveness of EBTs when they are transferred from research settings to UC. More empirical research is needed to understand implementation support process in relation to client outcomes to reduce the EBT research practice gap.

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Chapter 1 Introduction

Almost half of adolescents in the United States (46%) suffer from a mental health disorder, and an estimated 20% of these youth experience severe distress or functional impairment (Merinkangas, et al., 2010). Despite the high rates of mental illness, the majority of children and adolescents who experience any mental health disorder will not receive treatment (Burns et al., 1995; Katota, Zhang, & Wells, 1992; Merikangas et al., 2010, 2011). Effective psychosocial treatments have been developed to address youth mental health disorders (Weisz & Gray, 2008; Weisz, Hawley & Jensen-Doss, 2004). Treatments that have been tested, primarily in randomly controlled trials (RTCs) and found to benefit youth relative to comparison conditions, such as a wait-list or attention-placebo condition, are often referred to as "evidence based treatments" (EBTs). EBTs for youth psychopathology in children and adolescents outperform usual clinical care (Weisz et al., 2013).

Unfortunately, when youth receive mental health treatment, they are unlikely to receive an EBT from their mental health care provider (Herschell, McNeil, & McNeil, 2004). Studies examining mental health treatment in typical service settings report that community therapists value a wide range of strategies from various theoretical modalities, and these services can be characterized as eclectic (Brookman-Frazee, Garland, Taylor, & Zoffness, 2009; Garland, Bickman & Chorpita, 2010). Observations of usual care practice indicate therapists provide a great breadth of practice strategies, however, strategies are implemented with low intensity (Garland, Brookman-Frazee et al., 2010). Perhaps as a consequence, youth receiving mental health services in usual care often get worse or do not improve across an episode of care (Warren, Nelson, Mondragon, Baldwin, & Burlingame, 2010).

In theory, deploying EBTs into usual care settings makes sense; however, EBTs developed under rigorously controlled conditions in academic settings have been shown to fare less well when the providers, clients, and organizations are more similar to those found in typical care (Weisz, Jensen-Doss, & Hawley, 2006; Weisz et al., 2013). Whereas treatments developed in academic settings and implemented by expert providers to treat carefully recruited clients have shown large clinical effect sizes (Kazdin, 2008; Weisz, Weiss, Han, Granger, & Morton, 1995), these same treatments show attenuated benefit in more "real world" settings, such as community clinics and schools (Gibbons, Stirman, DeRubeis, Newman, & Beck, 2013; Weisz et al., 2013). The current challenge remains to close the gap between academic and usual care settings in order to provide effective treatments for youth suffering from mental health disorders.

Implementation strategies provide a mechanism to improve empirically supported treatment delivery in usual care. The goal of implementation strategies is to assist effective delivery of EBTs to improve their fit within complex contexts (Fixen, Blase, Naoom, & Wallace 2009; Proctor et al., 2009; Southam-Gerow & McLeod, 2013). Implementation strategies can include tools, training, consultation, and quality assurance/quality improvement to bridge innovations into practice (Wandersman, Chein, & Katz, 2012). Strategies are classified as targeting multiple, hierarchical levels. For example, creating funding initiatives targets top level policy and organizational structure while increasing clinician skill to improves lower level intervention delivery targets.

Research has posited that measuring implementation strategy success may be a crucial step in clarifying whether attenuated treatment benefits are due to poor treatment delivery or ineffective treatment protocol (Fixen et al., 2005; Proctor et al., 2009). Treatment fidelity refers to the degree treatments were delivered as intended (Southam-Gerow & McLeod, 2013; McLeod, Southam-Gerow, & Wiesz, 2009) and is composed of

three distinct components: adherence, differentiation and therapist competence (Southam-Gerow & McLeod, 2013). Threats to fidelity may interfere with internal validity and confound relationships between treatments and client outcomes (Southam-Gerow & McLeod, 2013; Perepletchikova, Treat, & Kazdin, 2007). Despite its importance, treatment fidelity is often measured inadequately in clinical trials (McLeod et al., 2009; Perepletchikova et al, 2007; Weisz et al., 2005).

Implementation support has been theorized as one approach to facilitate treatment fidelity and improve EBT success in usual care settings. Implementation support includes providing *tools* such as a specific treatment manual, provider *training*, *clinical consultation*, and *quality assurance* such as fidelity monitoring, which may include observation of actual cases and the provision of feedback (Garland & Schoenwald, 2013). The most promising implementation support modalities are in the early stages of research, and currently, a gap in the literature exists regarding which strategies are most crucial to improve delivery of interventions. Developing guidelines for implementation support may be especially critical to complex systems of care where children receive services, such as schools.

Offering mental health services in schools may be an optimal way to increase access to effective treatment for adolescents (Rones & Hoagwood, 2000; Tegethoff, Stalujanis, Belardi, & Meinlschmidt, 2014). The majority of youth who receive any mental health services are likely to receive them in a school setting (Farmer, Burns, Phillips, Angold, & Costello, 2003), particularly minority youth who do not have regular access to a doctor or other health care provider (Aviles, Anderson & Davila, 2006; Tegethoff et al., 2014). Interventions implemented in schools address barriers that limit access to services including transportation, child-care, and lack of access to a medical or health care professional, (Aviles et al., 2006).

Depression is one particular and common mental health disorder that may be amenable to treatment in schools. Because depression undermines achievement and school failure, treating depression in a school context may be valuable. An estimated 11% of youth will experience an episode of major depression before the age of 18 (Merkikangas et al., 2010) suggesting that it is a prevalent disorder requiring treatment to prevent debilitating impairment in school, peer, and family outcomes (Avenevoli, Swendensen, He, Burstein, & Merikangas, 2015; Fergusson & Woodward, 2002; Jaycox et al., 2009). Depression also correlates with physical health concerns, and lower quality of life ratings (Dockray, Susman, & Dorn, 2009; Morrison, Shin, Tarnopolsky, & Taylor 2015; Wickrama, Wickrama, & Lott, 2009). The presence of depression in community samples of children and adolescents has been found to increase the probability of having another mental health disorder by 20-fold (Angold & Costello, 1993). Adolescent depression predicts future suicide attempts with 30% of adolescents with major depressive disorder reporting suicidality and 10% reporting a suicide attempt (Avenevoli et al., 2015). Intervening during adolescence is critical since the consequences of untreated depression continue and worsen in adulthood.

Fortunately, EBTs have been tested and developed to treat youth depression. Cognitive behavioral therapy (CBT) has been documented as one EBT for treating depression in youth (Ferdon & Kaslow, 2008; Lewinsohn & Clark, 1999; Michael & Crowly, 2002; Reinecke, Ryan & Dubois, 1998, Weisz, McCarty, & Valeri, 2006) including school settings (Clark et al., 1995; Jaycox, Reivich, Gillham, & Seligman, 1994; Mychailyszyn, Brodman, Read & Kendall, 2012). CBT for depression has also been developed for use in school settings (Stark, 1990). Although school-based CBT interventions have been tested, they are rarely used (Ennett et al., 2003; Kratochwill, 2007; Schaughency & Ervin, 2006). School systems have been suggested as an ideal

context to take a larger role in supporting socioemotional functioning for youth (Weist et al., 2003) and should be a target for strengthening the capacity of mental health services. Due to the complexity of school systems, it is essential to further understand how implementation support can improve transportability of EBTs in schools and how desired client outcomes can be achieved within school contexts.

The purpose of this study is to examine the differential implementation support for a group-based CBT intervention (Act & Adapt) for adolescent depression in middle schools. Specifically, this study will examine how implementation support, which includes tools, training, weekly consultation and quality assurance feedback, herein called (AA-E) are related to improvements in client outcomes over time in comparison to an intervention group (AA) only receiving tools and training. All clinicians in both conditions will receive tools (manuals, worksheets, intervention materials) and a one-day training including both didactic and experiential training provided by a licensed psychologist. Both AA-E and AA groups will be led by indigenous school based clinicians. The AA-E group will receive weekly on-site consultation provided by a trained doctoral level graduate student supervisor. The supervisor will also provide quality assurance feedback on clinician fidelity following each session. This study will first examine if students in the AA-E group have greater symptom improvement relative to students in the AA group. Next, the study will examine if clinicians receiving additional implementation support, consultation and quality assurance, demonstrate greater treatment adherence and competence delivering the intervention, using observational coding. Finally, the researcher will examine if treatment fidelity correlates with student outcomes.

Chapter 2 Integrated Analysis

Unmet youth mental health needs have warranted national attention and federal support to identify and provide targeted support to at risk children and those with current needs (President's New Freedom Commission, 2003; Institute of Medicine, 2015; U.S. Public Health Service, 2000). One in five children and adolescents youth (herein referred to collectively as "youth") in the United States—a total of 8.3 million—has a diagnosable mental disorder (CWLA, 2010; Simpson, Cohen, Pastor, & Reuben, 2008). By 2020, adult mental health and substance use disorders are estimated to surpass all physical diseases as a major cause of disability worldwide, underscoring the critical need to detect and treat mental health symptoms when they begin in childhood (SAMHSA, 2015). Fortunately, psychosocial treatments have been developed to address a broad range of externalizing and internalizing mental health disorders (Chambless & Ollendick, 2001; Weisz & Gray, 2008; Weisz et al., 2004). Well-tested treatments exist to target symptoms of attention deficit disorder (ADHD), depression, anxiety, post-traumatic stress disorder, and disruptive conduct problems, among others (Weisz & Gray, 2008). However, most youth lack access to care leaving them at risk for educational failure, school drop out and involvement with the juvenile justice system (Golzari, Hunt, & Anoshiravani, 2006; Teplin, Abram, McClelland, Dulcan & Mericle, 2002).

The prolific production of named therapy treatments spurred the psychology field to evaluate which treatments lead to therapeutic benefit (Chambless & Hollon, 1998; Chambless & Ollendick, 2001). In 1993, the Task Force on Promotion and Dissemination of Psychological Procedures of Division 12 (Clinical Psychology) of the American Psychological Association formed to determine the effectiveness of psychotherapy interventions. The task force developed criteria to evaluate outcome research trials with

regards to the internal and external validity and the extent to which the studies demonstrated that the results were not due to confounding factors such as the passage of time (Chambless & Hollon, 1998; Kazdin, 2002). The committee provided a report outlining criteria to identify treatments demonstrating proven benefit referred to as "evidence -based treatments" (EBTs). An EBT is defined as a treatment shown to be more efficacious than a control group in two or more independent randomly controlled trials. The initial task force included two levels to classify treatment: *well-established* and *probably efficacious*. Well-established treatments demonstrate efficacy by being either statistically significant or superior to a pill, placebo, active treatment, or equivalent to an already existing well established treatment in at least two independent research settings by two independent research teams (Chambless et al., 1998; Chambless & Hollon, 1998; Silverman & Hinshaw, 2008). The goal of developing evidence criteria was to assist both clinicians and clients on the state of science to inform their treatment decisions (Southam-Gerow & Prinstein, 2014).

REVIEW OF THE EVIDENCE FOR EBTS

Presently, the large number of youth EBTs continues to rise to address a broad range of mental health disorders (Chambless & Ollendick, 2001; Hoagwood, Burns, Kiser, Ringeisen, & Schoenwald, 2001; Silverman & Hinshaw, 2008; Weisz & Gray, 2008; Weisz et al., 2004; Weisz, Ng, & Bearman, 2014). The majority of EBTs are cognitive behavioral therapies (CBT), and they exist for presenting problems of anxiety, depression, conduct and related disorders, Attention deficit hyperactivity disorder (ADHD) and related conditions, and post-traumatic stress disorder (PTSD) (Chambless & Ollendick, 2001; Weisz & Gray, 2008; Weisz et al., 2004), among others. Meta-analyses spanning more than four decades of research have found youth psychotherapy to

outperform waitlist or control conditions (Casey & Berman, 1985; Kazdin, Bass, Ayers, & Rogers, 1990; Weisz, Weiss, Alick, & Klotz, 1987; Weisz, Weiss, Han, Granger, & Morton, 1995). These meta-analyses were broad in their inclusion criteria including any intervention that mitigates any mental health disorder using any treatment modality except psychopharmacological treatment.

Meta-analyses assess the overall magnitude of all youth psychotherapy outcome research and include an aggregate summary of all outcome studies examining treatment for a broad list of mental health disorders. Meta-analyses measure the effect size (ES), which is the index of the magnitude and direction of treatment effect. The first meta-analysis by Casey and Berman (1985) included 75 studies published between 1952-1983 focused on children aged 12-years and younger. The analysis included outcome studies examining social adjustment (46%), hyperactive or impulsive behavior (13%), phobias (12%) and somatic problems (4%). A total of 64 studies included a treatment-control group, and collectively the mean ES, was 0.71. This indicated that the average treated youth outperformed youth in control groups by two-thirds of a standard deviation. While overall behavioral treatments outperformed nonbehavioral treatments, authors noted these differences were confounded by specific outcome measures and target problems specified in behavioral studies. These results were fundamental to challenging critics doubting the benefits of youth psychotherapy.

A second meta-analysis by Weisz et al. (1987) replicated efforts by Casey and Berman (1985) and expanded the sample to include 105 outcome studies including adolescents, focusing on children aged 4-18 years. Studies targeted externalizing problems (47%), internalizing problems (42%), and "difficult to classify" problems (0.6%) such as emotional disturbance. Similar results to Casey and Berman were found; behavioral interventions (77%) were more effective than nonbehavioral interventions

(17%) regardless of client age, clinician experience, or problem type. Overall, the mean effect size was 0.79, suggesting a moderate to large effect for child psychotherapy. A third meta-analysis by Kazdin et al. (1990) examined 223 outcome studies published between 1970-1988 focusing on youth aged 4-18. Outcome studies focused on externalizing problems (47%), internalizing (16%), learning and academic problems (16%) and both externalizing and internalizing problems (0.3%). Separate effect sizes were found for (a) studies using a treatment control comparison (N=105), (b) studies using a treatment and no-treatment control (N=64) and (c) studies including active control groups (N=41). The ES with the inclusion of active control samples was 0.77 at post-treatment indicating the average child functioned better than 78% of control group samples treatment. In order to address whether treatment effects are specific to the target intervention or if treatment effects occur due to increasing an overall general wellbeing, a fourth meta- analysis by Weisz et al. (1995) was conducted. The sample of 150 studies published between 1983-1993 focused on children aged 2-18 years. Results indicated psychotherapy effectiveness was more robust for outcome measures matching the target intervention, and therapy gains were not due to general enhancement or overall increased wellbeing from attending therapy.

Overall, these results indicate that three-fourths of the youth in intervention groups outperformed control groups demonstrating the positive effect of youth psychotherapy (Casey & Berman, 1987; Kazdin et al., 1990; Weisz et al., 1987, 1995) and a larger effect was found for behavioral strategies than nonbehavioral strategies (Casey & Bearman, 1987; Weisz et al., 1987; 1995). Collectively, all four meta-analyses reported mean unweighted effect sizes ranging from 0.71-0.84, within or just below Cohen's (1988) threshold for a large effect (0.80). Together, the meta-analyses include over 12,000 diverse subjects spanning over 200 studies, with the positive effects of youth

psychotherapy encompassing a large number of treatment modalities and target symptoms (Weisz, Weiss, & Donnenberg, 1992; Weisz et al., 2005).

Use of Untested Treatments Warrants Concern

Clinicians using treatments without demonstrated efficacy raises concern, since their effects are unknown and may be ineffective. Despite the overwhelming evidence for EBTs, these interventions are rarely used in usual care (McHugh & Barlow, 2010; Weisz et al., 2014). Usual care includes a wide variety of intervention techniques occurring in diverse settings including community mental health settings, schools, hospitals, and private practice (Kazdin, 2013). Alarmingly, the majority of youths do not improve across an episode of care in usual care settings and in fact about one-third show clinical worsening (Warren et al., 2010; Manteuffel, Stephens, Soundheimer, & Fisher, 2008). Warren et al. (2010) examined treatment trajectories and symptom severity of 936 youth in a public community mental health system and 3,075 youth receiving services through a private managed care system. Results found baseline symptom levels comparable across settings. However, when controlling for treatment duration, symptom severity worsened in 24% of youth receiving community mental health setting and in 14% of youth in managed care. Clinicians in both settings reported using eclectic treatment techniques, but the managed care group also reported short-term cognitive-behavioral strategies. Therapy did not impact symptoms for approximately one-half of youth who had no directional change in symptom severity over the course of treatment. This study highlights the need for intervention monitoring in usual care settings to reduce the number of children receiving untested and potentially ineffective treatments.

There is also evidence that these untested treatments, as delivered in clinics and community settings, may be ineffective. Weisz et al. (1995) examined outcome research

from 1972-1995 for clinic based research and only found nine studies meeting the following criteria: 1) involved clinic referred youth; 2) treatment was done in service clinics, programs, or agencies outside of university laboratories; 3) intervention was provided by practicing clinicians opposed to trained researchers; 4) therapy was provided as natural services instead of a research-based protocol; and 5) studies needed to provide a treatment group and control group with either no intervention or placebo. The sobering results found ES values for the nine studies ranged from -0.40-0.29 with a mean ES of (0.01), demonstrating that clinic-based therapy on average was as effective as no treatment at all. Weisz and Jensen (2001) replicated the search by Weisz and colleagues (1995) and only identified four additional studies meeting criteria highlighting the discrepancy of over 500 youth psychosocial efficacy trials in contrast to 14 effectiveness trials, or clinic based trials, investigating results of youth treatments in usual health settings. The results were similar to Weisz et al. (1995) in that the effect size across all fourteen studies was (-0.01) indicating that usual care treatment provided in clinics had a negligible, and sometimes detrimental, effect. Further, a randomized trial evaluating the effect of usual outpatient care for high-risk youth in comparison to an academic tutoring control group found little support for usual care effectiveness with an overall effect size of -0.08 (Weiss, Catron, Harris, & Phung, 1999). Similar results were found at 2-year follow-up demonstrating that child psychotherapy did not produce any delayed treatment effects (Weiss, Catron, & Harris, 2000).

Two recent meta analyses have shown that EBTs generally outperform usual care with small to medium effect sizes in head-to-head trials regardless of client comorbidity, ethnic minority representation, and symptom severity (Weisz et al., 2006; Weisz et al., 2013). The most recent meta-analyses assessed the effect of 52 studies reported a mean standardized difference of 0.27 and results persisted at follow-up assessments, indicating

a randomly selected youth would more likely have better outcomes after receiving an EBT than usual care treatment. While EBT performance is more modest when pitted against usual care treatments, these effects are still superior despite the challenges EBTs implementation confronts in usual care (Weisz et al., 2013).

Clinicians rarely use EBTs

As previously noted, EBTs are rarely used and rarely sustained in everyday practice (Garland et al., 2010; Kazdin, Holland, Crowley, & Breton, 1997). Pignotti and Thyer (2012) conducted a quantitative survey study assessing the use of evidence based treatments and novel unsupported therapies (NUTs) in a sample of 400 licensed clinical social workers (LCSWs) from 39 states across the United States. Results of this study indicated that an overwhelming majority of LCSWs reported the use of at least one EBT, but three-quarters of the sample also reportedly use NUTs in their everyday practice. The findings of the study were limited since the majority of the participants were in private practice, so the results may not be generalized to community mental health clinics. Further, survey research depends on self-report, and it is impossible to know what interventions clinicians use in their everyday practice. For example, clinician may have reported using evidence-based practices, but adherence to a treatment protocol or what parts of an intervention were used remains unknown. Despite the limitations, this study underscores how NUTs continue to be used in everyday practice and perhaps contribute to the ineffectiveness of usual care (Pignotti & Thyer, 2012).

Studies that have collected observational or chart review data report that usual care for youth varies widely with regard to types of interventions used, treatment duration, and intensity of techniques used during session (Borntrager, Chorpita, Higa-McMillan, Daleiden & Starace, 2013; Garland et al., 2010). Usual care has been

observed to frequently include a large breadth of both EBT and NUT strategies (Garland et al., 2010). However, the intensity of delivering strategies has been found to be negligible and core EBT components thought to be integral for treatment are often left out (Garland et al., 2010). The lack of depth of EBTs in usual care indicates that EBT delivery may be improved by aiming efforts to train clinicians on specific strategies used infrequently and at low intensity (Brookman-Frazee, Haine, Baker Ericzén, Zoffness, & Garland, 2010; Garland et al., 2008).

Consistent with observational and chart-review studies, clinician self-reported techniques often do not include EBTs (Borntrager et al., 2013). Borntrager and colleagues (2013) reviewed service provider monthly treatment and progress summaries. The sample included 814 youth ages 3-19 receiving interventions targeting traumatic stress in a large community mental health system, and 78% of youth had a comorbid diagnosis. Clinicians reported using delivering evidence-based techniques supported by the treatment outcome literature in 100% of case summaries. However, exposure—a key strategy common to EBTs for trauma (Chorpita, Daleiden & Wiesz, 2005)—was used intermittently ranging from only 14-22% of cases. Similar to Garland et al. (2010), clinicians delivered both empirically and non-empirically derived techniques with low intensity (Borntrager et al., 2013). In sum, even when EBTs are used in usual care, clinicians report that they often pick and choose protocol elements based on personal clinical preference, thus not following the research-based manual (Busa, Bearman & Heier, unpublished), often omit key elements of EBTs and may deliver these interventions below the prescribed dosage.

CONDITIONS OF USUAL CARE DO NOT MIRROR THE CONDITIONS IN WHICH EBTS WERE DEVELOPED

Efficacy versus effectiveness

A longstanding controversy in the youth intervention field is the performance gap between efficacy and effectiveness trials of EBTs (Chambless & Ollendick, 2001; Hoagwood, Hibbs, Brent, & Jensen, 1995; Institute of Medicine, 2014; Kazdin, 1991; 2008; Weisz et al., 1992; Weisz, Donenberg, Han & Weiss, 1995; Weisz & Gray, 2008). Efficacy refers to the benefit of an intervention under the ideal circumstances of a randomized controlled trial (RTC) often occurring in university labs or clinics. The benefit of treatment is determined by reduced symptomology or impairment. Effectiveness refers to the benefit of an intervention in naturalistic settings and conditions, also typically tested in an RCT. Treatment will typically be delivered in settings such as community health clinics, schools, and private practice, implemented by providers who were already working in these settings (Hoagwood et al., 1995; Silverman & Hinshaw, 2008). The current model for EBTs first involves the treatment tested under standardized conditions in structured laboratory settings. After two separate RTCs that demonstrate intervention benefit, the interventions are often tested in real world settings with a representative population to determine the external validity (Glasgow, Lichenstein & Marcus, 2003; Weisz et al., 2014). As already noted, when EBTs are transported into more typical settings their proven benefits from efficacy trials drop (Hoagwood et al., 2001; Weisz et al., 2006, 2013).

The clinical effect of EBTs may be attenuated in terms of benefit as the conditions in which they are tested become more similar to "real world" settings because they were developed and tested in highly controlled conditions (Chambless & Ollendick, 2001; Glasgow et al., 2003; Weisz et al., 2006, 2013). Regardless of the strong evidence base

for EBTs in well-controlled trials, the drop in effect as they move into real-world settings—coined the "implementation cliff" (Weisz, Ng, & Bearman, 2014, p. 59) leaves us with interventions compromised for external validity (Glasgow et al, 2003; Weisz, 2014).

Client characteristics differ in usual care

The efficacy RTCs that establish the evidence base have typically included clients that do not mirror the complexity of cases seen in usual care (Bearman, & Weisz, 2015; Weisz et al., 1993,1995, 2013). Only 2.1% of all youth were clinically referred in randomized controlled trials published between 1960-2009 (Weisz et al., 2013). Clinically referred youth are more likely to have comorbid disorders and co-occurring problems that require attention and treatment. However, the majority of EBTs have been designed for single problems, meaning intervention protocols may not offer the same results clients with comorbid disorders (Bearman & Weisz, 2015; Weisz et al., 1992; 2006; Southam-Gerow, Weisz & Kendall, 2003; Southam-Gerow, Chorpita, Miller & Gleacher, 2008). A more recent review of treatment studies spanning from 1994-2009 only found ten controlled trials that even included comorbid clients highlighting that EBTs have rarely been evaluated with the types of complex cases seen in usual care settings (Riosa, McArthur & Preyde, 2011). Further, treatment is more effective for youth with homotypic comorbidity, disorders among the same diagnostic grouping, than heterotypic problems. .Youth and their families in usual care are also more likely to be ethnically diverse, live in single parent homes, and have lower family income; factors that have been documented to lead to premature therapy termination (Kazdin, 1993) and reduced treatment benefit (Ehrenreich-May et al., 2011; Southam-Gerow et al., 2003; Weisz, Ugueto, Cheron, & Herren, 2013). It is well documented that ethnic minorities are

generally not well represented in efficacy trials (Huey & Polo, 2008), which may also influence the impact of EBTs in usual care settings. EBTs effects may not bridge with cultural values among minority youth and families receiving care attributing to attenuated benefits.

Clinician characteristics differ in usual care

Clinicians in research trials used to test EBTs differ from usual care clinicians in their professional experience, training, and educational backgrounds. In research trials, clinicians are often doctoral level clinicians or highly trained and motivated graduate students (Bearman et al., 2013; Weisz et al., 1992; Weisz, Donenberg, Han, & Kauneckis, 1995). On the other hand, clinicians in usual care vary in their professional training with the majority of the work force comprised of master's level social workers (Hartson, 2008). Lower percentages of graduate social work programs provide EBT coursework and supervision relative to psychiatry and clinical psychology training programs (Weissman et al., 2006) suggesting that this workforce may not receive adequate pre-service training in EBTs. Social workers may learn EBTs in post-service continuing education (CE) workshops, but these workshops rarely impact practice or therapist competence (Beidas, Edmunds, Marcus & Kendall, 2012). Clinicians in usual care also have higher caseloads with a broader array of diagnoses than clinicians in efficacy RCTs. Therefore, mastering single disorder manual would be inadequate to meet the wide array of symptoms and disorders across clients. Lastly, clinicians in RCTs are typically highly trained in the EBT being tested, often at the hands of the treatment developer (Bearman et al., 2013). In contrast, this sort of in-depth training in one EBT is typically not available to clinicians in usual care (Weisz et al., 2013).

Organizational characteristics differ in usual care

The success of interventions in complex systems of care depend on systems level factors such federal and state policies, and insurance policies and funding programs that impact the effectiveness of interventions in usual care more so than university laboratories (Glisson et al., 2008). The organizational social climate is comprised of the climate, (the way people perceive their environment) the culture (the way "things are done" or social norms in an organization), and work attitudes (Glisson et al., 2008; Verbeke, Volgering & Hessels, 1998). The organizational social climate in usual care varies greatly from the conditions in laboratory studies, and has been shown to have an impact on whether new interventions are adopted and how well they are implemented or sustained (Glisson et al., 2008).

The Role of Implementation Research in Closing the Research Practice Gap

The current challenge to close the gap on EBT effectiveness from the lab to usual care is addressed by dissemination and implementation (D&I) research (Glasgow et al., 2003). D&I research is not unique to psychology and is examined across a broad array of disciplines and stakeholders, such as agriculture, medicine, and engineering (Peters et al., 2014; World Health Organization, 2013). Little evidence suggests that EBTs are adopted and implemented effectively in community settings, preventing suffering clients from receiving beneficial treatment EBTs (President's New Freedom Commission on Mental Health, 2003). The role of D&I research as outlined by Southam-Gerow and McLeod (2013) is to (a) identify mechanisms to increase the speed of information transmission and (b) optimize psychosocial treatments into multiple contexts. The goal of implementation is for practitioners to use interventions correctly and effectively (Fixen et al., 2009; Proctor et al., 2009; Southam-Gerow & McLeod, 2013). As discussed, client,

clinician, and organizational variables differ greatly from the settings interventions that were developed and tested, and these variables cannot be controlled in the real world to make interventions fit (Peters et al., 2014). Therefore, we need to adjust the interventions and provide supportive infrastructure to better fit clients, clinicians, and organization structure. Implementation research can examine how maximizing the capacities of these variables can strengthen their ability to provide high quality interventions within unique contexts.

Defining an implementation research conceptual model

Implementation of any treatment, policy, or program is a process involving numerous sequences of activities (Proctor et al., 2011). The conceptual model adapted from Procter et al. (2009) (*Figure* 1.) posits that both separate intervention strategies and implementation strategies are required to implement treatments in usual care linked to implementation processes and outcomes. Further, implementation strategies are classified as targeting multiple, hierarchical levels. Four levels are characterized where implementation strategies can be targeted. The top level, systems environment, addresses strategies with external systems (including policy) that mandates implementation of regulations, policies, legal guidelines, or reimbursement factors. The middle two levels, organization and group/team, reflect internal champions or environmental factors associated with implementation. For example, an agency organizational culture can influence acceptability or uptake of EBTs, and strong leadership can promote ongoing use of EBT within an organization. The bottom level, individual providers/consumers, addresses individual clinician behavior in implementation. Strategies can focus on changing clinician attitudes that impede EBT use (Powell et al., 2012), or providing pre- or post-service training to advance EBT knowledge and skill. The model distinguishes

three distinct, but intercorrelated outcome levels: implementation, service, and client. This implementation model illustrates the complexity of advancing implementation research while also providing a framework to develop research questions and measure outcomes.

Implementation, service, and client outcomes

An important distinction is the difference between implementation, service, and client level outcomes. Client outcomes include satisfaction with treatment, symptomology, and functional outcomes (academic success, peer relationships, etc). Service outcomes, or quality improvement aims, include the efficiency, safety, effectiveness, timeliness, and patient centeredness of an intervention. Implementation outcomes include acceptability (perception of intervention among stakeholders), adoption (decision or intention to use an EBT), appropriateness (perceived fit of EBT), feasibility (extent the intervention can be conducted within the setting), fidelity (degree EBT was delivered as intended), penetration (degree that the an EBT can be integrated and delivered within a service system), and sustainability (extent intervention maintained), (Peters et al., 2014; Proctor et al., 2011). Implementation research requires measurement and evaluation of outcomes at all three levels (implementation, service, client), to understand if the treatment was not effective due to faulty intervention or implementation strategies (Fixen, Naoom, Blasé, Friedman, & Wallace, 2005; Perepletchikova & Kazdin, 2005; Proctor et al., 2011). If an intervention is not delivered using the same model as research trials, reduced effectiveness is not due to faulty interventions but rather poor implementation. Assessing each level of implementation individually can help discern how each construct contributes to treatment benefits.

Defining implementation outcomes: Integral for intervention success

An implementation outcomes framework allows researchers to compare which strategies demonstrate success (World Health Organization, 2014). A current implementation model posits that both intervention and implementation strategies are required to effectively use an intervention outside of laboratory settings. Implementation strategies can target multiple, hierarchical levels from higher systems such as funding to lower systems, or individual clinician behaviors (Powell, Proctor & Glass, 2013; Proctor et al., 2009). Specific implementation outcomes must be measured to evaluate the effectiveness of these strategies. Implementation outcomes are distinct from service and treatment outcomes (Fixen et al., 2005; Proctor et al., 2009). Reviews of implementation research have identified and conceptualized eight key implementation outcomes, including acceptability or perceived fit and sustainability or ability to continue intervention. Stakeholders can evaluate implementation outcomes to can determine if insignificant changes in client or service outcomes were due to ineffective treatment or flawed intervention implementation (Proctor et al., 2009; 2011).

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TREATMENT FIDELITY IS A CRITICAL IMPLEMENTATION OUTCOME

One implementation outcome, treatment fidelity, refers to the degree to which a treatment was delivered as intended (McLeod et al., 2009; Southam-Gerow & McLeod, 2013). Treatment fidelity is synonymous to treatment integrity, and used interchangeably in research (McLeod et al., 2009; Perepletchikova & Kazdin, 2005). The three components of fidelity are defined as follows: (Southam-Gerow & McLeod, 2013). *Adherence* refers to the extent which treatment was delivered as prescribed in a written protocol or manual; *differentiation* refers to the extent a therapist deviates from treatment protocols*;* and *therapist competence* refers to the level of skill and judgment level of the therapist when delivering intervention (Fairburn & Cooper, 2011; McLeod et al., 2009; Perepletchikova, Treat & Kazdin, 2007; Schoenwald et al., 2011; Southam-Gerow & McLeod, 2013).

Inadequate treatment fidelity measurement poses a threat to internal, external, construct, and statistical validity. For example, treatment fidelity measurement is critical to evaluate so that appropriate inferences and relationships between treatment and outcomes can be determined (Southam-Gerow & McLeod, 2013; Perepletchikova et al., 2007). Further, the findings cannot be generalized to other settings without knowing how the intervention impacted dependent variables. Compromised fidelity negatively impacts the construct validity of the intervention since it cannot be determined what the intervention was and how effects were produced. Finally, the statistical conclusion

validity is compromised when interventions are not delivered as intended. Unsystematic error could be introduced and consequently increase within the group variability, leading to reduced effect sizes and statistical power (Perepletchikova et al., 2007).

Treatment fidelity has been defined as an important factor in clinical research yet few clinical trials adequately report fidelity processes for replication (McLeod et al., 2009; Perepletchikova et al., 2007; Weisz et al., 2005). An examination of the full youth psychotherapy literature (N=236 studies), published between 1965-2002, found that only approximately half reported use of a treatment manual and only approximately one-third reported consultation or adherence checks suggesting treatment may have not been delivered as intended (Weisz et al., 2005). Another study evaluated treatment fidelity from studies in six top impact factor psychology and psychiatry journals. All studies were reviewed and scored using a measure to evaluate how the studies established, assessed, evaluated and reported fidelity, and also whether the studies reported clinician adherence and clinician competence. Overall results indicated that only 3.5% of studies implemented fidelity procedures adequately. Treatment adherence was only implemented adequately in 8.9% studies, with approaching adequacy in 39.1% and implemented inadequately in 52% of studies. Results for therapist competence were similarly low, with 87.1% of procedures implemented inadequately, 11.4% with approaching adequacy, and 1.50% adequately. Inaccurate fidelity assessment leaves a critical unanswered question: whether treatments are not effective in usual care (treatment failure) or whether they are not properly implemented (implementation failure), (Proctor et al., 2011). Failure to measure treatment fidelity poses a threat to interpretations of the validity of findings. Threats to fidelity may be one reason why interventions do not provide benefits when transported to real world settings.

IMPLEMENTATION SUPPORT IS ONE STRATEGY TO INCREASE FIDELITY

One type of strategy, implementation support, can be used to facilitate and maintain treatment fidelity to increase the validity of interventions and increase their success in usual care contexts. As described previously within the conceptual implementation model, implementation strategies can target multiple levels. For the purpose of this study, the implementation support methods will focus on targeting the individual clinicians.

Implementation support methods are one characteristic of efficacy trials that could increase therapist fidelity and help equalize EBT performance in usual care. The current ''gold standard'' of training in EBT includes a workshop, a treatment specific manual, and clinical consultation (Sholomskas et al., 2005). Roth, Pilling & Turner (2010) found that "exemplary" CBT efficacy trials included model specific pretrial training, ongoing model specific consultation during the trial, use of treatment manual, and measurement and monitoring quality assurance indicators of treatment fidelity. Further, the training in clinical trials included didactic presentations, video case examples, and behavioral role-playing. Prior to starting the research trials, clinicians were also required to demonstrate competency with pilot cases. Fidelity checks were a common component in efficacy trials. The authors concluded that EBTs should be packaged as comprehensive packages of consultation and training in addition to the manuals alone.

Evidence suggests that high quality training should include "active" and "passive" components (Beidas & Kendall, 2010; Garland & Schoenwald, 2013). "Passive" components include didactic lectures on treatment content and principals while "active" learning components include necessary skill modeling, behavioral role plays, and practices cases (Beidas & Kendall, 2010; Fairburn & Cooper, 2011). Key components of "active training" should include coaching and feedback for therapists. Training in EBTs

has been found to influence therapist knowledge, attitudes and perceived behavior about EBTs (Fixen et al., 1995; Garland & Schoenwald. 2013). Time-limited, discrete training such as the typical workshops used for continuing education credits alone do not result in behavioral change and proficient treatment delivery (Beidas & Kendall, 2010).

A second critical component for treatment fidelity includes ongoing consultation and quality assurance such as fidelity monitoring with feedback. Comprehensive meta-analysis of the child and adolescent outcome literature lends strongest empirical support for consultation and fidelity monitoring (Novins, Green, Legha & Aarons, 2013). However consultation is often not included in dissemination efforts when transporting EBTs to usual care (Sholomska et al., 2005). While training and tools are critical components for effective EBP delivery, alone they do not elicit behavioral change in clinician practice (Wandersman et al., 2012; Beidas & Kendall, 2010; Beidas et al., 2012; Roth et al, 2010). Ongoing consultation provides the opportunity for clinicians to clarify skills, practice skills over time, receive coaching, and problem solve barriers to treatment implementation (Fixen et al., 2005; Beidas et al., 2012; Schoenwald, Mehta, Frazier & Shernoff, 2013).

In support of this, results from a trial examining three training modalities for cognitive behavioral therapy (CBT) for substance abuse found that community clinicians who received consultation, didactic training, and a manual, demonstrated higher levels of CBT adherence and skills when performing a behavioral role play than clinicians who only received training and manual or manual alone (Sholomkas et al., 2005). While clinicians in the training and manual condition had higher scores on adherence and skill than the manual only group, these results were not statistically significant. This indicates that consultation is a key component for behavioral change. The study occurred with community-based clinicians providing some evidence that training strategies from

efficacy trials can be implemented in usual care. An RTC evaluating three separate training techniques significantly increased fidelity for an anxiety based EBT with post training consultation. Even though consultation was not part of the randomized design, each hour of consultation post training improved therapist adherence by 0.40 points and skills by 0.30 points on a seven point scale (Biedas et al., 2012). Further, fidelity measures, including adherence and skills, continued to improve at follow-up which is noteworthy since studies utilizing only training strategies have demonstrated only minimal or even declining adherence scores at follow-up when consultation was not provided (Beidas et al., 2012; Sholomkas et al., 2005). Another RCT assigned licensed substance abuse professionals to various training groups for learning motivational interviewing. Similar to other studies, training provided gains in initial proficiency as measured by audio-recorded practice sessions, but gains diminished at four and eight month follow up (Miller, Yahne, Moyer, Martinez & Pirritano, 2004). Participants who received feedback on practice tapes and individual coaching had larger proficiency gains at follow-up assessments.

Results of a randomized experimental analogue study also suggest that it is not merely ongoing support that influences treatment fidelity, but the components of that support. Mental health trainees who received training in cognitive restructuring for youth depression showed increased treatment fidelity with standardized clients following ongoing consultation that included modeling, role play, and quality assurance feedback, whereas trainees who received supportive and didactic consultation failed to make any gains following the training, and did not approach proficiency (Bearman, Schneiderman, & Zoloth, under review). Taken together, these results indicate that ongoing consultation and feedback can maintain treatment proficiency and improve clinician adherence and competence.

Treatment fidelity has been indicated as one key component for intervention success, and is essential to interpret findings of research trials (Perepletchikova & Kazdin, 2005). Treatment fidelity is a multifaceted construct that includes three components: adherence, differentiation, and competence. Measurement of individual fidelity components is key, as a clinician could deliver all content in a treatment manual but poorly, or the therapist could skillfully provide an intervention but include content not prescribed in a treatment manual (Busa et al., unpublished). An often overlooked aspect of efficacy trials include implementation support strategies such as treatment manual selection, training, and ongoing consultation and fidelity monitoring. Including these implementation support strategies into an EBT is one way to increase overall fidelity and effectiveness of EBTs when they are transported into usual care. Some studies indicate implementation support strategies results in higher clinician adherence within community health contexts. However, we need to directly measure these methods in a broader range of settings and with more diverse clinical samples. Developing guidelines for effective implementation support strategies, including consultation and quality assurance, at the clinician level may help increase fidelity of treatments and thus improve client outcomes. This may be especially important in complex systems of care where youth receive services. Next we discuss how school contexts are one place to examine fidelity to yield positive emotional, behavioral, and academic outcomes for students.

SCHOOLS MAY BE A LOGICAL PLACE TO PROVIDE EBTS

For the few youth who do obtain services, the education system is the "de facto system of care" (Burns et al., 1995, p. 152). Schools are the primary provider of behavioral health services for youth (Burns et al., 1995; Farmer et al., 2003; Hoagwood et al., 2001). Specifically, 70-80% of youth who receive any mental health services receive

services from schools (Burns et al., 1995; Hoagwood et al., 2001). School mental health services have better access to youth than other sectors (e.g. community health and private providers) necessitating effective school based services (Center for School Mental Health, 2013). Additionally, schools are the most common first point of entry for mental health services and those that first receive services within the education sector are least likely to subsequently receive services from another sector of care (Burns et al., 1995; Leaf et al., 1996; Weist, Myers, Hastings, Ghuman & Han, 1999).

Schools reduce logistical and natural barriers that make it a more ideal environment to address the mental health needs of youth. School services reduce financial costs that prevent children from obtaining additional mental health services. Uninsured youth and those whose families are ineligible for private insurance can receive free care within schools. Caregivers may also be unable to take time off work to take their children to appointments, and the burden is eliminated in school settings. Additionally, school services reduce financial expenses including transportation to appointments and child- care for other siblings. Stigma or distrust of providers is another reason parents often do not obtain services for their children (Bringewatt & Gershon, 2009). Parents may be more comfortable to seek and utilize school services from a system with which they are already familiar. Teachers play an important role in identifying and providing referrals for youth in their classrooms that would benefit from mental health services (Williams, Horvath, Wei, Dorn & Johnson-Reid, 2007) and can use their existing family relationships to refer youth for care.

Schools target larger numbers of youth with mental health needs

Particular youth populations are especially likely to lack access to effective mental health (MH) care. Specifically, ethnic and minority youth disproportionally lack

access relative to non-minority youth (Burns et al., 1995; Leaf et al., 1995; Merikangas et al., 2011, Snowden & Yamada, 2005). Latino youth have the highest rates of unmet needs and are 2.6 times less likely to receive services than their white counterparts (Katoaka et al., 2002). Likewise, a disproportionate number of youth from poor or low-income families suffer from mental health illnesses (Bringewatt & Gershoff, 2009). Low socioeconomic status (SES) is the largest predictor for youth emotional problems emotional problems, and it also accounts for the majority of the racial and ethnic disparities in MH problems (Werner & Smith, 1992). Youth in poverty are more likely to receive services for shorter periods of time or terminate services early (SAMHSA, 1999). The largely unmet mental health needs of these particularly vulnerable youth can be reduced with school mental health services, as ethnic minority youth and low income youth are more likely to obtain services when they are offered in schools than when they are referred to traditional mental health clinics (Baruch, 2001; Levy & Land, 1994).

Schools are a logical place to provide implementation support

Schools have more access to youth and families than other MH professionals. School clinicians also have opportunity to impact youth at multiple levels from universal to selective interventions to prevent MH symptoms from reaching clinical levels (Kratochwill, 2007). Provision of school mental health services also allows for the natural observation of youth outcomes disrupted by poor mental health. School mental health problems are strongly correlated with disciplinary actions (Jennings, Pearson & Harris, 2000), academic performance (Greenberg et al., 2003; Welsh et al., 2001; Zins, Bloodworth, Weissberg, & Walberg, 2004), special education referrals, need for more restrictive placement (Bruns et al., 2004) and graduation rates (Lehr, Johnson, Bremer,

Cosio, & Thompson, 2004). Likewise, the peer social context, which is also disrupted by mental health problems, can also be easily evaluated in the school setting.

DEPRESSION IS SERIOUS MH DISORDER THAT CAN BE TREATED WITH EBTS

Depression is one of the most impairing and common health concerns and 12% of youth experience a depressive episode in their lifetime (Merikangas et al., 2010). Depressed youth are more likely to experience impairments in multiple peer domains including family, school functioning, and physical functioning. Youth depression is correlated with lower grades, lower perceived peer support, less academic engagement and efficacy, and poorer physical quality of life indicators (Jaycox et al., 2009; Morrison et al., 2015). Functional impairments also negatively affect caregivers who report increased strain and stress caring for their depressed children (Jaycox et al., 2009). Further, depressed youth face increased risk for substance abuse, future adult unemployment and unplanned pregnancy, (Armstrong & Costello, 2002; Avenevoli et al., 2015; Birmaher et al., 1996; Fergusson &Woodward, 2002). Rates of depression increase during adolescence, and incidences of depression are drastically higher for girls than boys (Avenoli et al., 2015; Lewisohn, Rhode & Seeley, 1998; Merikangas et al., 2010; Petersen, Sarigiani & Kennedy, 1991; Thapar, Collinshaw, Pine & Thapar, 2012). Most importantly, youth depression is a risk factor for adolescent suicide, and research suggests almost half of youth suicide victims have a mood disorder diagnosis (Fergusson & Woodward, 2002; Gould, Greenberg, Velting & Shaffer, 2003; Pfeffer, 2001; Waldvogel, Reuter & Oberg, 2008).

The presence of depression in community samples of children and adolescents has been found to increase the probability of having another mental health disorder by 20-fold (Angold & Costello, 1993). Most recent estimates have found that 63.7% of

adolescent major depression disorder cases (age 13-18) were associated with another mental illness compounding functional impairment (Avenevoli et al., 2015; Birmaher, Ryan, Williamson, Brent, & Kaufman, 1996; Merikangas et al., 2010). The consequences of untreated depression persist well into adulthood, and the impact only worsens. Youth depression further predicts mental health impairment, poor physical in adulthood, unemployment warranting early detection and treatment (Copeland, Shanahan, Costello & Angold, 2009; Ferguson, Horwood, Ridder, & Beautrais, 2005).

In 2013, approximately 70% of males and 60% of female adolescents with major depressive disorder did not receive any treatment (National Survey of Drug Use and Health, 2013). Lack of mental health service use may be particularly true for ethnic minority youth, who face increased risk for depression, (Avenevoli et al., 2015, Bringewatt & Gershoff, 2009). Nearly three fourths (71.4%) of African American adolescents and more than half (63%) of Hispanic and Latinos did not receive treatment for depression (National Survey of Drug Use and Health, 2013). Treatment patterns of mental health care indicate that when ethnic youth obtain treatment they attend fewer therapy appointments and receive shorter therapy sessions in comparison to Caucasian peers (Saloner, Carson, & Le Cook, 2014).

CBT for depression is one effective treatment

Cognitive behavioral therapy (CBT) is one of the most studied EBTs for treating youth depression (Ferdon & Kaslow, 2008, Lewinsohn & Clark, 1999, Michael & Crowly, 2002, Reinecke et al., 1998, Weisz et al., 2006). CBT is a collaborative, problem-focused technique based on behavioral and cognitive conceptualizations of depression (Beck & Beck, 2011; Stark, 1990). CBT for depression typically teaches coping skills, problem solving, cognitive restructuring, and increasing positive behaviors.

These strategies aim to develop adaptive cognitive, attributional, and behavioral patterns that lead to improved symptoms and functioning (Asarnow, Jaycox & Tompson, 2001). Meta-analysis focusing on CBT specific interventions for depression have found varying ES sizes ranging from 1.02 (Reinecke et al., 1998), 1.27 (Lewisohn & Clark, 1999), 0.72 (Michael & Crowley, 2002) and 0.34 (Weisz et al., 2006). The lowest ES size found by Weisz and colleagues (2006) can be attributed to more strident inclusion criteria and applying stronger statistical analyses for more precise measures of effect size, yet the results still indicate a small to medium effect of CBT compared to standard care for depression.

CBT can be adapted in schools with implementation support

Although school-based CBT treatments (Baskin, Slaten, Sorenson, Glover-Russell, & Merson, 2010; Weisz et al., 1997; Reese, Prout, Zirkelback & Anderson, 2010) and school-based CBT treatments for depression in particular (Clark et al., 1995; Mychailyszyn et al., 2012; Stark, 1990), have been developed, their use remains limited in schools (Ennett et al., 2003; Kratochwill, 2007; Schaughency & Ervin, 2006). The most recent school efficacy trial examined the evidence based Positive Thoughts and Action prevention program for middle school at risk for depression with an added parent component compared to usual school services did not find clinically signifiant effects between treatments (McCarty, Violette, & McCauley, 2010). However, the treatment yielded high rates of participation and satisfaction by both parents and students, underscoring the feasibility of implementing EBT in schools to student improve emotional well-being. In a survey of 548 National School Psychologists, 72% reported being not familiar with well-researched EBTs (Hicks, Shahidullah, Carlson and Palejwala, 2014). In a similar vein, low percentages of the sample reported using EBTs in

their daily practice with 89% implementing EBTs rarely or never; 7% sometimes; 2% half of the time; and only 1% reporting using EBTs often or very often. When asked about perceived EBT barriers to use, the top reasons were lack of training; efforts to implement seemed unreasonable; and they did not have necessary support to implement EBTs. Unique factors in school settings may influence EBT implementation warranting examination (Forman et al., 2013). Reviews of implementation of EBTs in schools found that school organizational structures such as oversight committee, program characteristics (use of a manual and videos, fit of intervention to school goals, training and quality assurance), and administrator support were key factors to EBT delivery (Forman & Barakat, 2011). These results suggest that school-based providers lack appropriate support (e.g. tools, training, and ongoing consultation) to implement EBTs within school contexts.

Summary

Schools play a central role in providing access to mental health services to youth (Burns et al., 1995; Costello et al, 2014; Stephen, Weist, Katoaka, Adelsheim, & Mills, 2007). School are the primary mental health providers for low-income and ethnic minority youth (Farmer et al., 2003), and these youth are more likely to obtain services when offered in schools (Baruch, 2001; Levy & Land, 1994). School MH services reduce barriers such as transportation issues, financial constrains, and stigma or distrust of mental health providers (Bringewatt & Gershon, 2009, Stephan et al., 2007). Further, schools can link mental health to school success and demonstrate the correlation between psychological and physical well-being (Catalano, Oesterle, Fleming, & Hawkins, 2004).

Depression is one MH disorder that may be amenable to treatment in schools (Calear & Christensen, 2010; Clark et al., 1995; Jaycox et al., 1994). CBT for depression is one treatment that has been tested and developed in school contexts (Gillham et al.,

2007; Gillham, Reivich, Jaycox & Seligam, 1995; Stark, 1990; Weisz, Thurber, Sweeney, Proffitt, & LaGagnoux, 1997), yet it remains widely unused (Ennett et al., 2003; Kratochwill, 2007; Schaughency & Ervin, 2006). Survey data indicate that many school psychologists rarely use EBTs with students and barriers for use include lack of time to learn a treatment manual, inadequate training, and insufficient support to sustain EBT delivery (Hicks et al., 2014). School clinicians may lack appropriate support to deliver EBTs effectively.

SUMMARY AND RATIONALE

Approximately 4 in 5 youth experience a mental health disorder across their lifetime (Merikangas et al., 2010). Untreated mental health needs leads to negative short-term and long-term outcomes including reduced school disciplinary actions (Jennings et al., 2000), substance abuse (Reiger et al., 1990), involvement in the juvenile justice system (Golzari et al., 2006) and impaired physical chronic health functioning (Alonso et al., 2014). Despite the high prevalence less than half of these youth receive any services and youth with externalizing disorders were more likely to obtain treatment than youth with internalizing disorders including depression and anxiety (Costello, Sampson, Kessler & Merikangas, 2014)

Fortunately a cadre of EBTs have been developed and tested to be beneficial to treat youth mental health disorders (Chorpita et al., 2011). Research has found EBTs to outperform usual care regardless of client comorbidity, ethnic minority representation, and symptom severity (Weisz et al., 2006; Weisz et al., 2013). However, most youth do not receive EBTs from their service providers and are more likely to receive eclectic, non-empirically supportive treatments (Garland et al., 2010). The use of untested treatments warrants concern as many youth either do not improve during an episode of

care or show clinical worsening (Warren et al., 2010). Even when youth do receive an EBT, providers often deliver intervention components less intensively and core, active elements are often left out (Garland et al., 2010). Also, clinicians may often pick and choose which EBT elements they use or rely clinical preference, thus not following the empirically validated manual (Busa et al., unpublished). The clinical benefits of EBTs may be compromised in usual care contexts, and therefore efforts should be aimed towards training clinicians to improve EBT delivery.

Implementation support has been posited to help close the gap on EBT effectiveness from the laboratory to usual care. The goal of implementation support is to identify which factors improve the speed of information transmission and increase psychosocial treatments in multiple usual care contexts (Southam-Gerow & McLeod, 2013). However, little research exists on which implementation strategies advance EBT delivery. Therefore, research is needed assessing specific implementation strategies to help determine how they contribute to treatment benefits. Understanding the specific implementation processes that leads to improved client outcomes when EBTs are transported to usual care holds promise to advance the impact of effective treatments for youth mental health disorders.

Chapter 3 Methods

RESEARCH QUESTIONS AND HYPOTHESES

Research question 1a. Will youth in the AA-E condition report significantly greater improvement in post-treatment and six-month follow-up assessments of symptoms than youth in the AA condition?

Hypothesis 1a. It is hypothesized that youth in AA-E condition will report a greater decrease in depressive symptoms across the four data collection phases

symptoms relative to youth in the AA condition.

Research question 1b. Will youth in the AA-E condition report significantly greater improvement in post-treatment and six-month follow-up assessments of attendance and grades than youth in the AA condition?

Hypothesis 1b. It is hypothesized that youth in AA-E condition will have higher increase in attendance and homework completion relative to youth in the AA condition across the four timepoints.

Research question 2. Will clinicians in the AA-E demonstrate significantly higher average treatment fidelity and greater improvement over time than clinicians in the AA condition, as measured by observational coding?

Hypothesis 2. It is expected that average fidelity will be higher for clinicians in the AA-E condition. It is expected that average fidelity will improve significantly more over time for the AA-E condition (beginning, early mid point, late mid-point and end of treatment) than the AA group.

Research question 3. Is there a statistically significant relation between clinician fidelity and client depression outcomes measures?

Hypothesis 3. There is a significant positive correlation between clinician fidelity and client outcomes on client depression outcome measures.

PARTICIPANTS

Youth sample. 6th and 7th grade students with elevated scores on the Children's Depression Inventory, 2nd Edition (CDI-2; Kovaks, 2011) indicating clinical risk for depression will be recruited from two middle schools serving ethnically diverse students to participate in a video guided, group intervention for depression called "Act & Adapt," (Connor-Smith, Jensen-Doss, & Weisz, 2004; Weisz, Thurber, Sweeney, Proffitt, & LeGagnoux, 1997). The sample will include 72 youth, including an estimated 58% female, ages 12-15 years; 42% will be Caucasian, 34% Latino/Latina, 13% Asian, 8% African American, and 3% Two or more Races.

School based group clinicians. One school-based clinician will lead each Act & Adapt group. Professionals indigenous to schools (employed by schools or contracted with schools) who provide supportive services to pupils vary at each school campus. To account for the diversity of service clinicians, group clinicians will be broadly defined as any school-based professional who provides emotional/behavioral support services to students including practicum students seeking masters and doctoral degrees, school counselors, and Communities in Schools (CIS) social workers. A total of twelve clinicians will participate in the study with the majority (91%) female and average 32 years of age. Among clinicians, 75% will be Caucasian, 17% Latino, and 8% will be African American. The majority (59%) will have a master's in social work, 25% will have master's degree in counseling psychology, 8% will have a doctoral-level psychology degree, and 8% will be a graduate practicum student.

MEASURES

Youth measures. The Children's Depression Inventory, 2nd Edition, (CDI-2; Kovaks, 2011) is a brief self-report questionnaire designed to assess depressive symptoms in youth from 7-17 years of age. The CDI-2 consists of 28 items with an item response scale from 0 (none) to 2 (definite) completed by youth. The CDI-2 provides a total score for depression as well as two subscales. The Emotional Problems subscale is subdivided into Negative Mood/Physical Symptoms and Negative Self-Esteem and the Functional Problems subscale is subdivided into Ineffectiveness and Interpersonal Problems (Bae, 2012). The CDI-2 has high levels of internal consistency (alphas from .67-.91), has satisfactory test-retest reliability (.76 to .92), demonstrates construct validity, demonstrates discriminant validity, and correlates with other measures of depression (Bae, 2012; Tobin & Mulderink, 2014). Parent and youth self-report measures will both be used since research has shown youth and parent reports of depression often vary (Kazdin, French, & Unis, 1983).

The CDI-2 Parent form (Kovaks, 2011) is a parallel measure, consisting of the same item content asked from different perspectives (i.e. youth view of the self versus guardian view of youth), with increasing scores reflecting higher depressive severity. The CDI-2 parent form consists of 17 items and provides three scales as well (Total Score, Emotional Problems, and Functional Problems). Youth with a T-score above 65, indicating elevated depressive symptoms will be asked to participate in the study. Data from both parent and student versions will be collected at all data collection time-points.

Student homework is defined as the number of days a student turns in homework in core reading and math classes during a six week grading period. This data will be collected for each student (baseline, mid-point, post-intervention, and 6-month follow-up). At each time point the data from the prior six weeks will be used for analyses.

Secondary student attendance is defined as the number of days absent or tardy during a six week grading period. This data will be collected for each student at each time-point (baseline, mid point, post intervention, and 6 month follow-up).

Therapist measures. The Therapist Background Questionnaire (TBQ) consists of 11 items related to clinician demographic information, type of training, degree, years of clinical practice, theoretical orientation, typical practices, and typical client demographics.

Implementation outcome measures. The Therapist Integrity to Evidence Based Interventions (TIEBI; Bearman, Herren & Weisz, 2012; adapted from a coding system used in Weisz et al., 2012) coding system will assess treatment integrity— including therapist adherence and therapist competence in delivering the intervention. Treatment session recordings will be coded, in five-minute segments, for the presence/absence of 15 items reflecting Act & Adapt content. Sessions in each treatment episode will be randomly selected for coding, with all sessions divided into fourths (beginning, early, middle, late phase of treatment) and one session from each phase of treatment randomly selected for each group. Coding will include therapist adherence (percent of five minute segments in which prescribed content from Act & Adapt is present) and therapist competence (skillfulness and thoroughness of delivery, rated from 0=not at all to 4=expert). Coders will be blind to study condition and will show acceptable agreement with an expert coder prior to coding (ICC > .60). A total adherence score for each coded session will be generated using the mean proportion of total session time (i.e., total number of five-minute segments) spent on Act & Adapt skills. A total skillfulness score will be obtained by averaging the item extensiveness scores for each coded session. Agreement between independent coders on a double-coded sample of 31 therapy sessions was good for both adherence (mean ICC=.92, range .69-1.00) and competence (mean

ICC=.94, range .77-99) in a prior study (Weisz, Bearman, Santucci & Jensen-Doss, under review).

The Manual for the Cognitive Behavioral Therapy Competence Observational Measure of Performance with Youth Depression (CBTCOMP-YD; Lau & Weisz, 2012) is a coding system to measure therapist competence in the delivery of CBT for youth depression, and consists of 21 items assessing aspects of specific practices. For the purpose of this study only the expertise quality dimension and global CBT competence measure will be utilized. The expertise quality dimension is scored on a three-point Likert-scale (1 = novice, 3 = expert). The global CBT competence is scored on a 10-point Likert-scale (1 = novice, 5 = intermediate, 10 = expert). Inter-rated reliability will be obtained for global CBT competence and CBT expertise measures summary scores. In a prior study using these items, blind coders demonstrated strong interrater reliability on the global CBT competence and CBT expertise measures summary scores (*M* ICC = .78) (Bearman et al., under review).

PROCEDURE

Approval by human subjects committee. This study will be conducted in compliance with the ethical standards set forth by the American Psychological Association and The University of Texas at Austin. All research materials will be approved prior to data collection by the Departmental Review Committee within the Department of Educational Psychology and by the Institutional Review Board of The University of Texas at Austin.

School partnerships. The PI will partner with two local middle school principals to participate in a mass screening of depression among 6th and 7th grade students and a subsequent trial of the AA-E and AA groups for adolescent depression.

Recruitment of youth. Initial universal school-wide screening using the CDI-2 will be administered to all 6th and 7th grade students (N=1,600) at participating middle schools as part of routine care to identify students in need of services. Students with a T-score above 65 (Kovaks, 2011) indicating elevated depressive symptoms will be eligible for participation. Using previous recruitment data from urban, low- income middle schools, approximately 10% of the sample will be identified for elevated symptoms of depression (*N*=160). Caregivers of high- risk students will be sent a letter by the researcher informing that their child may be eligible to participate in a coping skills group.

Based on previous recruitment processes in urban, low-income schools approximately 47% of parents will provide consent for participation (*n*=75), (Bearman, unpublished). Based on previous school based depression trials, it is expected that 5% of the sample will discontinue participation in the study for the following reasons: student moves out of school district prior to completion of treatment, student is no longer interested in participating (Bearman, unpublished). Caregiver consent and student assent will be obtained. The final sample used for 6-month follow-up assessment will include (*n*=72) students.

Recruitment of clinicians. The PI will first meet with school principals and administrative staff to develop school partnerships in the spring prior to beginning the intervention. At the beginning of the school year, principals will identify potential school providers based on who is already providing MH services within the school. A recruitment meeting will be scheduled with all identified providers to explain research rationale and answer questions. Consent forms will be collected from all providers.

Assessment schedule. Families who consent for their child to participant will complete a pre-intervention measures with study staff at a time/location convenient for

them: home, or schools during non instructional times. Assessment measures (see Table 1) will be collected pre intervention, mid point, post intervention and 6- month follow-up. School clinicians will complete pre assessment measures prior to receiving training in Act & Adapt.

Double randomization. A total of six Act & Adapt groups will occur at each school. The PI will complete a double randomization and randomly assign both clinicians (*n*=12) and also students (*n*=72) to the (a) AA-E condition with clinicians receiving tools, training and additional implementation support (weekly consultation and quality assurance) or the (b) AA condition with clinicians receiving tools and training. Each school clinician will be assigned to a student group of up to six students.

Training and tools. All group clinicians will receive an eight hour intervention workshop for Act & Adapt providing didactic and experiential training. All group clinicians will also be given tools including clinician manual, student handouts and intervention video. Training will include experimental learning techniques including modeling, role -play, and practice cases found to be effective in increasing EBT knowledge (Roth et al, 2010).

Implementation support: Consultation and Quality Assurance. Treatment clinicians (*n*=6) in the AA-E condition will receive weekly, in–vivo consultation from the PI to discuss group process, content, and plan for upcoming meetings. Clinicians will engage in role-plays to practice techniques proposed to be effective for fidelity (Garland & Schoenwald, 2013; Roth et al., 2010; Schoenwald, Mehta, Frazier & Shernoff, 2013) such as cognitive restructuring and problem solve barriers such as group motivation. All consultation meetings will be held by the same supervisor. Each consultation meeting will be recorded and a written agenda will be used for uniformity. Quality assurance will be defined as the supervisor (PI) reviewing audiotapes and providing feedback on the

fidelity from the previous session. The PI will complete a weekly written feedback QA form indicating which session goals the clinician addressed and skills to improve for subsequent session.

Group intervention. Act & Adapt is an empirically supported treatment adapted for video guided delivery in schools, based on the Primary and Secondary Control Enhancement Training (PASCET) program for treating depression (Bearman & Weisz, 2009). The intervention is founded on the two-process model of change and coping.

Students learn primary (ACT) skills for youth to change objective conditions such as using relaxation to soothe physiological sensitivity, or enhancing social skills to improve interpersonal interactions, and (ADAPT) skills on adjusting one's thoughts or expectations to minimize the impact of a situation—such as changing the meaning attached to an event without altering conditions (Bearman & Weisz, 2009). ACT & ADAPT includes a flexible manual with scripted material and suggested activities, student handouts, and a video of ethnically diverse youth struggling with life stressors and using the ACT & ADAPT strategies to cope. The video is delivered in a series of brief vignettes and used to generate group discussion and model the use of coping skills.

Group structure, location, and setup. The Act & Adapt program will consist of 12 weekly sessions. Groups will meet once a week for 45 minutes and consist of up to eight youth per group. Each coping skills group will take place during the time and place most convenient for each school, as agreed upon by the school principal and staff, and without interrupting instructional time. All groups will be audio-recorded in order to measure fidelity for each session. Audio-recordings will be saved on a secure hard-drive for fidelity coding.

Fidelity coding and scoring. The adapted TIEBI and the CBTCOMP-YD will be used to independently code selected sessions by two trained coders on the research

team. Coders will be blind to clinician condition. Each coder will have completed a didactic training course and will be familiar with the intervention protocol. Training will consist of review of the scoring manual, review of specific session segments in order to familiarize themselves with examples of different treatment procedures at varying levels of extensiveness, and practice scoring of sessions compared to expert ratings, Meeting will be held with coders to discuss questions and make uniform decisions. Inter-rater reliability will be obtained for the TIEBI and CBTCOMP-YD by double coding a random selection of 25% of all coded sessions.

Compensation. All school clinicians will receive a honorarium at baseline, mid-point, post intervention, and 6-month follow-up when assessment measures are collected. Caregivers and youth will also each receive a five-dollar gift card for completing all measures at each timepoint.

PROPOSED STATISTICAL ANALYSES AND EXPECTED OUTCOMES

Preliminary analyses will be conducted to assess whether there are significant differences on the demographic and clinical characteristics between participants in either of the two experimental conditions (i.e. Intervention only or intervention group plus weekly consultation and feedback) ensuring equal randomization. To determine if differences are present, *t* tests for continuous data at baseline (age, grade, CDI-2 scores attendance, homework completion) and Chi-square tests for categorical data will be employed (ethnicity, gender). Youth and parent report of depression symptoms do not correlate highly (De Los Reyes & Kazdin, 1995). Separate analyses will be run for CDI-2 youth and parent reports. Preliminary tests will also be conducted on school clinician characteristics using Chi-square will be employed (theoretical background, professional degree).

Prior to conducting a formal analysis of the data, preliminary steps will be taken to strengthen the validity of the conclusions to ensure assumptions of a repeated measures ANOVA are met. Plots and descriptive data will be inspected so that there are not any serious departures from the normality assumptions. Independence of observations is reasonable since subjects were randomly assigned into groups and measurements were taken individually. Levene's test will be conducted to determine that homogeneity of variance was not violated. The assumptions of sphericity will be through Mauchley's test of sphericity. If violated, the Greenhouse-Geisser adjusted *F* tests will used when interpreting effects involving the within-subjects factor of time.

Preliminary analyses will also be used to determine if there were significant school effects. Repeated measures ANOVA with 2 between factors (condition and school) and one-within factor (time) will be conducted to test for a possible main effect of school and three-way interaction (School × Condition × Time). Assuming both the main effect of school and interaction are not significant, the primary hypothesis will best tested by Condition × Time and post hoc follow-ups.

Power analysis. An a priori power analysis was conducted using G*Power software to determine the approximate number of participants required in the repeated measures ANOVA analysis to obtain a statistically significant finding in an overall model with a small effect size $f = 0.15$, alpha =.05, power of .80, 2 groups and 4 measurements, 0.50 correlation among measures, and nonsphericity factor =1 were used to determine adequate sample size. A total sample size determined was 62 participants. A previous RTC using the PASCET model delivered by graduate students for elementary school students reported an effect size of 0.48, which is just below Cohen's threshold for a medium effect (Weisz et al., 1997). A recent meta-analysis of school-based depression interventions found indicative programs targeting students exhibiting elevated levels of

depression, to be the most promising with effect sizes varying from 0.05-0.71. Therefore, a more conservative effect size slightly above a small effect for Cohen's *f* (*f*=0.1) was used.

Main Analyses. A 2 (intervention) × 4 (time) ANOVA with repeated measures will be run on the dependent variables to determine if students in the intervention plus consultation and feedback demonstrate a stronger change in reduced symptoms and improved educational outcomes across four time points. This question seeks to address whether participants in the intervention group whose therapists received ongoing consultation and feedback reported lower depressive symptoms and improved educational outcomes. Significant Condition × Time interactions will be explored with post-hoc *t*-tests on between group differences and within-group differences. Follow-up post-hoc comparison of means will be used completed using the Tukey correction.

The second research question addresses whether fidelity is higher for those clinicians in the AA-E condition who received additional consultation and quality assurance feedback over the course of treatment. A 2 (condition) × 4 (time) ANOVA with repeated measures on time will be performed on clinician fidelity using the CBTCOMP-YD and TAM-OBs. Significant Condition × Time interactions will be explored with post-hoc *t*-tests on between group differences and within-group differences. Follow-up post-hoc comparison of means will be used completed using the Tukey correction.

The third research question suggests that a positive relationship exists between fidelity and client outcomes. It is possible that fidelity mediates the relationship between condition and client outcomes (Proctor et al, 2011). A mediation model using Sobel's test requires a large sample size, and a minimal sample size of 10-20 participants for each

independent variable is need in multiple regression (Keith, 2006, p. 202). With a small clinician sample size (n=12), this relationship cannot be tested. To assess this, we will use a Pearson correlation using average fidelity scores at the time-points (beginning, early, middle, late phase of treatment) to examine if there is a significantly positive relationship between average fidelity and client outcomes at each time point.

Chapter 4 Discussion

Methodological Considerations

One important consideration was whether to use a multi-level modeling approach in order to account for the effects of different nested levels of students within groups, nested within providers and schools. Only including two schools makes it reasonable to used a fixed effect to account for the school variation since a mixed model will not save degrees of freedom when treated as a random effect.

Instead, preliminary analyses will be performed to examine possible main effects of school on all outcomes. If, a significant interaction of School × Condition × Time, is found, the analysis will include school as a grouping variable in the repeated measures ANOVA. However, to increase the power of the results and validity of findings, future analysis could include hierarchical linear modeling (HLM) procedures with school as a level 2 grouping variable and client outcomes as a level 1 time varying variable. Also, the outcomes of individuals in the same group could be correlated with each other due to the effect of the clinician group leader. This may violate an assumption.

Limitations

This study has limitations including a small sample size that is limited to two schools from a in southwestern region in the US, thereby limiting the generalizability to other school districts each with their own organizational infrastructures. The small sample also prohibits a direct test of the potential mediating role of fidelity on youth outcomes. The current study may provide promising preliminary evidence that fidelity mediates the effect of consultation and quality assurance on youth outcomes, suggesting that higher adherence and therapist competence in turn improves depression symptoms

and increases academic performance. However, a mediation model using Sobel's test requires a large sample size, and a minimal sample size of 10-20 participants for each independent variable is need in multiple regression (Keith, 2006, p. 202).

A larger, more fully powered study would also permit examination of individual clinician attitudes on treatment fidelity. Positive attitudes towards EBTs have been shown to correlate with EBT adoption and use (Borntrager, Chorpita, Higa-McMillan, & Weisz, 2009). Future directions could include evaluating the interaction of attitudes and condition to examine whether those in the AA-E condition reported higher positive attitudes towards EBTs post treatment.

A second limitation is that this study only examined strategies that targeted provider level effects on implementation. It is possible that other, higher organizational factors may interact or limit effectiveness of implementation strategies at the individual clinician level (Proctor et al., 2009). Clinicians may have access to the tools, resources, and support to implement the intervention, but school organizational contexts may not be willing or able to provide the infrastructure for EBT training and supervision. Thus an individual provider may rely on larger systematic influences to adequately deliver effective interventions.

Appendix A

Table 1

Administration and Collection Time Points of Measures

Measure	Screen	Pre	Mid point	Post	6 mo.
Demographic Questionnaire	P, S, C				
Children's Depression Inventory (CDI-2)	S, C	S, C	S, C	S, C	S, C
Homework Completion		S	S	S	S
Attendance		S	S	S	S

Note: S=student; C= caregiver, P=provider; Homework Completion and attendance will be collected from student records

Appendix B

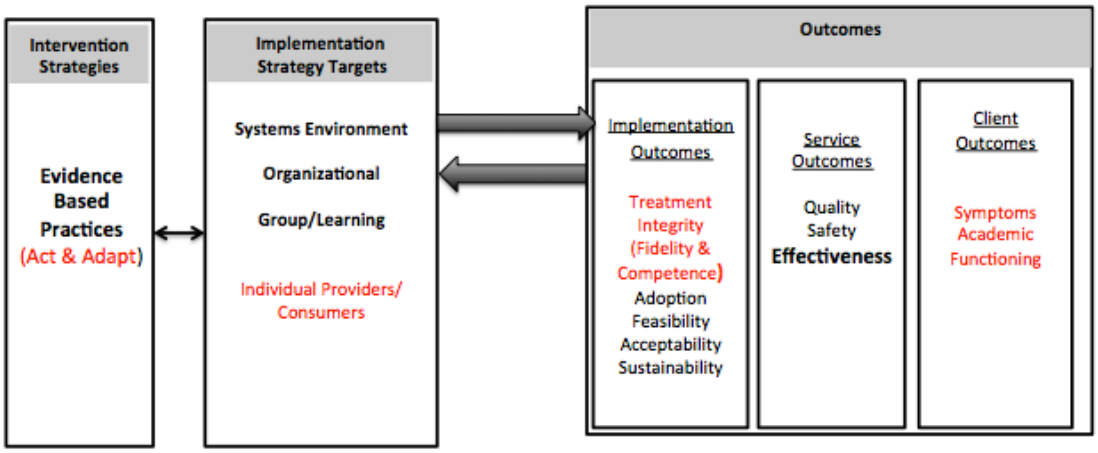

Figure 1. Implementation framework. This figure illustrations the conceptual model of implementation strategies on fidelity and client outcomes. Adapted from Procter et al., 2009; 2011.

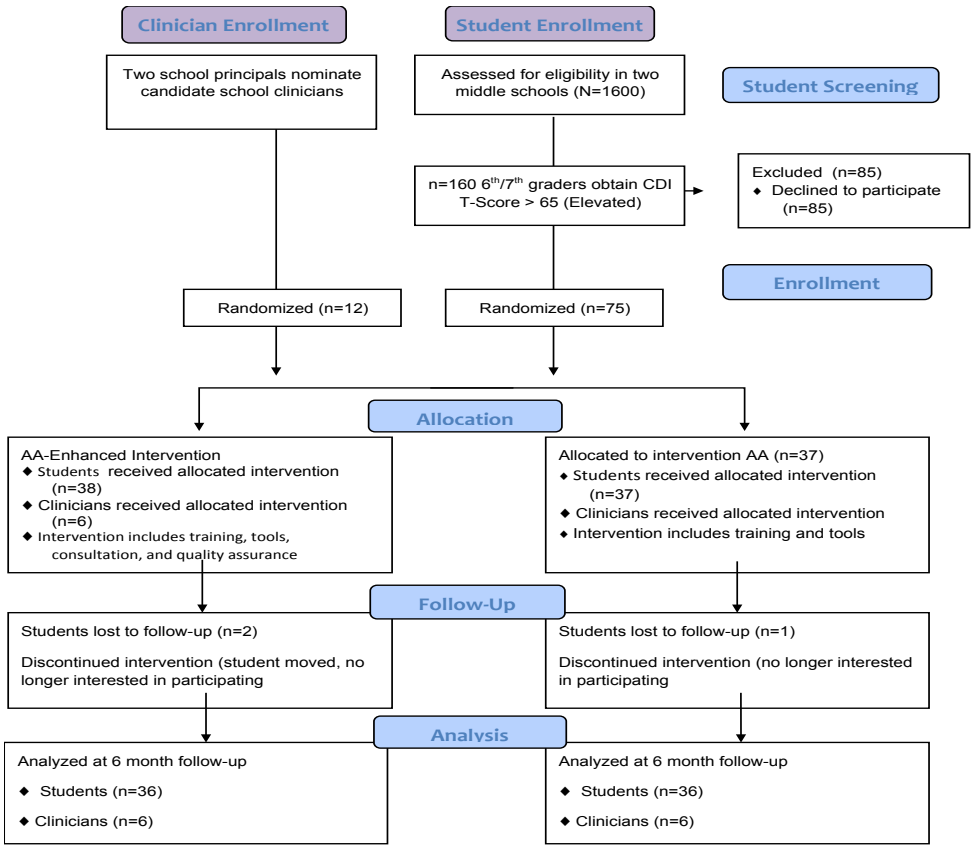

Figure 2. Participant recruitment overview

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