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Child and Adolescent Adherence with Cognitive Behavioral Therapy for Anxiety: Predictors and Associations with Outcomes

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Abstract

Objective: Cognitive Behavioral Therapy (CBT) for anxiety disorders is effective, but non-adherence with treatment may reduce the benefits of CBT. This study examined (a) four baseline domains (i.e., demographic, youth clinical characteristics, therapy-related, family/parent factors) as predictors of youth adherence with treatment and (b) the associations between youth adherence and treatment outcomes.

Method: Data were from 279 youth (ages 7 to 17 years, 51.6% female; 79.6% White, 9% African American) with DSM-IV-TR diagnoses of separation anxiety disorder, generalized anxiety disorder and/or social phobia, who participated in CBT in the Child/Adolescent Anxiety Multimodal Study (CAMS). Adherence was defined in three ways (session attendance, therapist-rated compliance, and homework completion).

Results: Multiple regressions revealed several significant predictors of youth adherence with CBT, but predictors varied according to the definition of adherence.The most robust predictors of greater adherence were living with both parents and fewer youth comorbid externalizing disorders. With respect to outcomes, therapist ratings of higher youth compliance with CBT predicted several indices of favorable outcome: lower anxiety severity, higher global functioning, and treatment responder status after 12 weeks of CBT. Number of sessions attended and homework completion did not predict treatment outcomes.

Conclusions: Findings provide information about risks for youth non-adherence which can inform treatment, and highlight the importance of youth compliance with participating in therapy activities, rather than just attending sessions or completing homework assignments.

Keywords

child and adolescent anxiety; cognitive behavioral therapy; adherence; attendance; homework compliance

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Youth Adherence with Cognitive Behavioral Therapy for Anxiety Disorders: Predictors and Associations with Outcomes

Anxiety disorders are among the most common youth mental health disorders and are associated with broad impairments in functioning (Beesdo, Knappe, & Pine, 2009; Davis, Ollendick,&Nebel-Schwalm, 2008; Hughes, Lourea-Waddell, & Kendall, 2008). There is substantial evidence that cognitive behavioral therapy (CBT) is effective (e.g., Higa-McMillan, Francis, Rith-Najarian, & Chorpita, 2016; Walkup et al., 2008); however, about 40–50% of youth do not show clinically meaningful improvement (James, Soler, & Weatherall, 2005).Although a number of factors have been examined in relation to CBT outcomes for anxiety (e.g., baseline anxiety levels, parental psychopathology; see Compton et al., 2014; Southam-Gerow, Kendall, & Weersing, 2001), one factor that has received relatively little attention, yet may be critical for understanding child psychotherapy outcomes, is patient adherence (McNicholas, 2012; Nock & Ferriter, 2005).

In general, patient adherence is conceptualized as participation in prescribed therapy activities. However, there is no "gold standard" definition of adherence with CBT and prior studies have used varying definitions. The three most common indicators of patient adherence with therapy are attendance, observer ratings of adherence/compliance, and homework completion. Attendance encompasses the number of therapy sessions attended and is sometimes examined as treatment completion, early termination, or dropout, which are closely related constructs. In addition to attending sessions, researchers have emphasized the importance of complying with therapeutic activities, including participation and involvement in the therapy session and actively engaging in activities such as role-playing (Becker et al., 2015; Nock & Ferriter, 2005). The degree of compliance in the therapy session is typically measured by the therapist (e.g., Nock, Ferriter, & Holmberg, 2007) or independent observer (e.g., Chu & Kendall, 2004). Also, homework is an essential component of CBT for anxiety and completing homework assignments outside of the therapy session may impact treatment outcomes (Hudson & Kendall, 2002). Studies of treatment adherence for youth mental health disorders have focused on treatment for externalizing disorders, which are primarily behavioral interventions with parents, and have examined parent attendance and therapist-rated quality of participation in parent management training sessions (e.g. Dumas, Nissley-Tsiopinis, & Moreland, 2007; Nix, Bierman, McMahon, & CPPRG, 2009). Studies that have examined internalizing and externalizing disorder treatment, have mostly looked at retention or completion of treatment (e.g. Miller, Southam-Gerow, &Allin, 2008; Pellerin, Costa, Weems, & Dalton, 2010). Moreover, findings from this literature have been inconsistent in terms of predictors of

attendance and therapist ratings of compliance, which may be partly due to the different definitions of adherence (Nix et al., 2009; Nock & Ferriter, 2005).Because there is no unitary "gold standard" definition of adherence this study examined three related, but distinct constructs of adherence: attendance, observer ratings of compliance, and homework completed.

Given the importance of youth adherence in predicting therapy outcomes (Becker et al., 2015; Nock & Ferriter, 2005) and the limited data on youth adherence with treatments for anxiety, this study focused on youth adherence with CBT for anxiety in a large sample of children and adolescents and explored: a) predictors of different aspects of youth adherence and b) the associations between youth adherence and CBT treatment outcomes for anxiety.

Predictors of Youth Adherence

Based on prior reviews of patient adherence with treatment across the lifespan (Kardas, Lewek, & Matyjaszcyk, 2013; Nock & Ferriter, 2005; Sabate, 2003), four domains of predictors of youth adherence with anxiety treatment were examined: demographics, youth clinical characteristics, therapy-related factors, and parent/family factors.

Demographics—With respect to demographic factors, low socioeconomic status (SES), ethnic minority status, and living with a single parent have been associated with fewer sessions attended and lower quality participation in parent management training for young children with disruptive behavior problems (Nix et al., 2009; Dumas et al., 2007). However, studies that have looked at treatment completion in community mental health clinics have yielded inconsistent findings. In a sample of children from early childhood through adolescence, Miller and colleagues (2008) found that SES, race/ethnicity, and single parent status were the most common differences between youth who remained in outpatient therapy and those who terminated early at a clinic serving youth with a variety of diagnoses and therapy treatments. However, Pellerin and colleagues (2010) reported no significant associations between demographics(such as child age, ethnicity, gender and family income) and child and adolescent treatment completion or attendance with therapy treatment at an urban community mental health clinic. There are two studies that have examined demographic predictors of youth adherence with anxiety treatment. In one study, ethnic minorities and children from single parent households were more likely to terminate CBT treatment prematurely (Kendall & Sugarman, 1997). However, in another study with a similar but smaller sample, there were no significant associations between demographics and child involvement in therapy (Chu & Kendall, 2004). Additional studies are needed to clarify differences in findings.

Youth clinical characteristics.—With respect to youth clinical characteristics, greater internalizing or externalizing symptom severity and impairment in functioning were associated with premature termination (Pellerin et al., 2010).Data on child clinical predictors of adherence with treatment for anxiety disorders is limited, with one study finding no associations between internalizing and externalizing symptom ratings and completion of CBT for anxiety (Pina, Silverman, Weems, Kurtines, & Goldman, 2003).

Therapy-related factors.—Research on therapy-related factors has examined a number of variables in relation to treatment adherence, such as expectations and attitudes about treatment (Becker et al., 2015). Specifically, positive parent and child beliefs about the effectiveness of treatment significantly predict greater therapist-rated adherence and attendance, respectively (Edlund et al., 2002; Nock et al., 2007).These expectancies have yet to be examined in predicting youth adherence with anxiety treatment.

An additional therapy-related factor is the therapeutic relationship, and children with positive relationships with their therapists are more likely to attend therapy sessions for a range of mental health disorders (Garcia & Weisz, 2002). For youth anxiety treatment specifically, there is little data supporting this hypothesis. Hughes and Kendall (2007) found a moderate correlation ($r = .38$) between the average rating of the therapeutic relationship and homework compliance concurrently. Additional research is needed to examine whether initial therapeutic relationship predicts adherence.

Parent/family factors.—Parents play an important role in whether a child or adolescent is adherent with therapy. Parents are typically responsible for transportation and payment for services, directly influencing session attendance (Nock & Ferriter, 2005). Factors associated with parents and families, such as parental psychopathology and family stress, are believed to have an impact on homework completion and managing the child's involvement in out of session therapy activities for treatment of anxiety disorders (Hudson & Kendall, 2002). Some, but not all, studies on adherence with treatments for a range of mental health disorders have revealed that greater parental depressive symptoms is associated with lower quality participation in parent management training (Nix et al., 2009) and youth completion of mental health treatment (Pellerin et al., 2010). Also, parents who reported more parenting and life stress were more likely to have children who attended fewer therapy sessions and dropped out of treatment prematurely (Miller et al., 2008; Pellerin et al., 2010).Overall, there is limited research examining predictors of youth adherence with CBT for anxiety treatment.

Youth Adherence and Therapy Outcomes

In theory, patient adherence with treatment is critical to the effectiveness of the treatment, however, few empirical studies have explored these effects for child anxiety treatment outcomes and extant findings are inconsistent. For instance, when defined as observer ratings of practicing and using prescribed treatment skills, there is preliminary evidence that greater child involvement in individual therapy sessions, especially at mid-treatment, is associated with larger reductions in anxiety symptom severity and impairment ratings post-treatment (Chu & Kendall, 2004). However, when defining adherence as completion of therapy assignments out of session (i.e. homework assignments), data are mixed—with some studies showing a positive relation with outcomes (Kazantzis, Deane, & Ronan, 2000; White et al., 2013) and others (Hughes & Kendall, 2007) suggesting that other variables such as therapeutic relationship are more important predictors of CBT treatment outcome for youth anxiety. Replication of these findings with well-powered samples is needed, given the modest sample sizes of prior reports.

The Current Study

The first study aim was to identify baseline and initial therapy predictors of treatment adherence. Four domains of predictors were examined: baseline demographics, clinical characteristics, therapy-related factors, and family and parent factors. Given the limited and mixed research on predictors of youth adherence with CBT, the first aim was exploratory using a large number of baseline and initial therapy predictors. In terms of demographic predictors, it was hypothesized that higher SES, non-racial/ethnic minority status, and living with both parents would be associated with greater adherence. Other hypothesized predictors of higher levels of youth adherence include: less severe internalizing and externalizing symptoms, expectancy that therapy will be effective, a positive therapeutic relationship, lower parental psychopathology and lower family stress. The second study aim was to examine the association between adherence and treatment outcomes. Based on prior studies, it was hypothesized that greater adherence would predict better treatment response, reduced anxiety symptoms, and greater overall functioning at post treatment.

Method

Participants

Participants were 279 children and adolescents (51.6% female; 79.6% White, 9% African American, 2.5% Asian, 1.4% Native American; 13.3% Hispanic) from six sites enrolled in the Child/Adolescent Anxiety Multimodal Study (CAMS; see Compton et al., 2010; Walkup et al., 2008 for detailed study methods) who were randomly assigned to the two conditions including CBT (CBT only n = 139 and combination CBT and Sertraline (COMB)n = 140).Participants were recruited through advertisements and other outreach in effort to represent the populations typically seeking services at the various clinics located in urban settings in the United States. Comparison of participants in CBT only and COMB showed no significant differences on any measures of youth adherence with CBT. Eligible participants were ages 7–17 years old, who met criteria for at least one of the following DSM-IV TR (American Psychiatric Association, 2000) anxiety disorders: separation anxiety disorder (SAD), social phobia (SoP), or generalized anxiety disorder (GAD). Although participants with a wide range of comorbidities were included, youth with the following primary disorders were excluded: major depressive disorder, bipolar disorder, pervasive developmental disorder, and schizophrenia or schizoaffective disorder. Youth with low IQ were generally excluded, since low IQ may limit the youth's ability to participate in CBT. Participants were from predominantly middleclass and upper middle class families, with 75.6% scoring at or above 4 on the Hollingshead Two-Factor Scale (range 0 – 5; Hollingshead, 1971).

CAMS CBT Intervention

CAMS used the *Coping Cat*, which is a manual-based CBT for children and adolescents. There are two age-appropriate versions of the *Coping Cat* protocol: *Coping Cat* for children (Kendall & Hedtke, 2006) and *C.A.T. Project* for adolescents (Kendall, Choudhury, Hudson, & Webb, 2002). Both protocols include 12 individual child sessions (60 minutes each) and 2 parent only sessions scheduled over 12 weeks. Each session includes a homework assignment, referred to as a STIC (Show That I Can) task to practice coping skills, and/or

exposure task performed outside of sessions. CBT was provided by trained therapists (see Podell et al., 2013 for full description).

Procedures

After families signed informed consent, data collection started at baseline with a semi-structured diagnostic interview conducted by Independent Evaluators (IEs). IEs were certified to evaluate participants and supervised throughout the study. Also at baseline, the child/adolescent and parent/guardian filled out questionnaires. In the CAMS project, eligible youth were randomized into one of four treatment conditions: CBT only, SRT (Sertraline medication) only, COMB (combination CBT and SRT), or PBO (placebo) (see Walkup et al., 2008 for the CONSORT diagram for CAMS). In the present study which examined youth adherence with CBT only, youth in the SRT only and PBO were therefore excluded.For youth in the CBT and COMB conditions, their CBT therapist completed a session summary form at every session during the treatment period. At 12 weeks (post treatment), IEs conducted the diagnostic interview and rated symptom severity and functioning. IEs were masked to participants' treatment conditions. Families were compensated for their participation. All study procedures were approved and monitored by the Institutional Review Boards at each site.

Measures

Predictors—Demographic predictors (collected from the parent) included youth age, sex, race, ethnicity, socioeconomic status (SES), and whom the youth was living with.Because most youth in this study were White (79.6%), race was dichotomized into White and non-White. SES was derived from parent reports of parental occupation and parental education level using Hollingshead's (1971) two-factor index. Total scores ranged from 1 to 5, and were dichotomized into low SES (scores 1–3) and high SES (scores 4–5).Baseline clinical characteristics (principal diagnosis, number of comorbid internalizing and externalizing disorders) were assessed using the Anxiety Disorders Interview Schedule for DSM-IV-Child and Parent Versions (ADIS-IV-C/P; Silverman & Albano, 1996). The ADIS-IV-C/P has demonstrated excellent psychometrics (Lyneham, Abbott, & Rapee, 2007; Silverman, Saavedra, & Pina, 2001). In CAMS, 10% of IE evaluations were assessed for inter-rater reliability, calculated as intraclass correlation coefficients, which ranged from .82 to .88 (Compton et al., 2014). The IEs identified the principal diagnosis and determined the number of other internalizing (depressive or anxiety disorders other than SAD, SoP, or GAD) and externalizing (ADHD, ODD, or CD) diagnoses. Using information gleaned during the ADIS-IV-C/P interview, IEs also rated the global anxiety symptom severity using the *Clinical Global Impressions Scale – Severity* (CGI-S; Guy 1976). The CGI-S ranges from 1 (not at all ill) to 7 (extremely ill), with higher scores indicating greater severity.The CGI-S has demonstrated strong associations with self-report and therapist administered measures of symptom severity and impairment (Zaider, Heimberg, Fresco, Schneier, & Liebowitx, 2003).To assess overall functional impairment, the *Children's Global Assessment Scale* (CGAS; Shaffer et al., 1983) was rated by the IE on a scale from 0 to 100. Lower scores reflect greater functional impairment and lower overall functioning. The CGAS has acceptable psychometric properties (Green, Shirk, Hanze, & Wanstrath, 1994).

Therapy-related factors included pretreatment expectancy and initial therapeutic relationship. Pretreatment expectancy was assessed at baseline prior to randomization, by asking each child/adolescent and parent to indicate how much improvement they expected under each of the treatments (COMB, SRT, CBT, PBO). Possible ratings were 1 (very much worse) to 7 (very much improvement). Treatment expectancy ratings for the treatment to which the youth was randomly assigned (CBTor COMB) were used in the current analyses.The quality of the initial Therapeutic Relationship was rated by the therapist after the first CBT session using a 7-point Likert scale, with responses ranging from "very poor" to "very good."

Family/parental psychopathology was assessed at baseline using multiple measures of parent psychopathology, burden, and family functioning. The *Brief Symptom Inventory* (BSI; Derogatis, 1993) was rated by the parent and assessed distress associated with parental psychopathology. The BSI is a 53-item self-report measure, rated on a 5-point Likert scale from 0 (not at all) to 4 (extremely). The BSI Global Severity Index (BSI-GSI) provides a single score of current psychological distress and symptoms (higher values indicate greater severity). Prior studies have demonstrated good psychometrics (Derogatis & Melisaratos, 1983), and in this sample, the alpha for the BSI-GSI was .95 at baseline. The family *Burden Assessment Scale* (BAS; Reinhard, Gubman, Horwitz, & Minsky, 1994) is a 21-item measure of caregiver strain around having a child with a mental health disorder. Parents completed the BAS and items included questions about how much their child's anxiety disrupts family life, routines, and emotions over the previous two weeks using a scale ranging from 1 (not at all) to 5 (very much). Higher scores indicate greater burden. Reliability and validity for the BAS have been demonstrated (Reinhard et al., 1994); the alpha was .92 at baseline for this sample. The *Brief Family Assessment Measure-III* (BFAM-III; Skinner, Steinhauer, & Santa-Barbara, 1995) provides an assessment of family functioning from the perspective of children/adolescents and their parents.Parents and children/adolescents responded to 14 items using a 5-point scale.The BFAM-III General Scale, tapping overall perceived family health, was used. Higher scores suggest greater levels of perceived family dysfunction. There is discriminant and content validity for the BFAM-III (Bloomquist & Harris, 1984), and the alpha was .85 for parent report and .75 for youth report at baseline for this sample.

Adherence measures.—*Sessions attended:* attendance was scored as the number of youth therapy sessions attended within the 12 week treatment period (possible range 1–12 sessions). *Therapist-rated compliance:* after each CBT session, therapists rated the youth's overall compliance on the session summary form, defined as one question asking how well the child completed the requirements of the therapy as given by the therapist (e.g. works on the assignments of the session, works on homework) and how engaged the child is in the treatment process (e.g. engaged in the sessions, resists or dismisses the therapists' suggestions). Therapists were instructed to consider compliance independently of improvement or adverse events and provided a rating using a 7-point Likert scale, with responses ranging from "poor" to "good".Therapist-rated compliance was averaged over all completed sessions to form a mean compliance score per person. *Homework completed:* therapists reported whether a child completed a STIC or exposure task prior to the session

(yes/no) at each CBT session. The measure of homework completed was calculated as a ratio of the total number of sessions that the youth completed homework divided by the total number of sessions the youth attended. This data was extracted from the session summary form.

Treatment outcomes.—Three different measures of youth treatment outcomes were used, which were assessed by IEs at baseline and 12 weeks post randomization.The *Pediatric Anxiety Rating Scale* (PARS; RUPP, 2002) is a measure of the severity/impairment associated with a broad range of anxiety symptoms. The IE-rated PARS total score in this study was calculated by summing six items assessing anxiety severity, frequency, distress, avoidance, and interference in the previous week.Scores ranged from 0 to 30, with higher scores reflecting greater anxiety symptom severity.The PARS has demonstrated good reliability and validity (RUPP, 2002). Global functioning at 12 weeks was assessed by the IE with the CGAS (previously described with the clinical predictors at baseline).The *Clinical Global Impressions-Improvement* (CGI-I; Zaider et al., 2003) scale assessed "responder status".IEs rated the CGI-I on a scale from 1 (very much improved) to 7 (very much worse). Responder status was used as a dichotomous measure; youth with CGI-I scores of 1 (very much improved) or 2 (much improved) were categorized as treatment responders. The CGI-I has demonstrated strong associations with self-report and therapist administered measures of symptom severity and impairment (Zaider et al., 2003).

Data Analysis

Missing data.—All but 18 children participated in the post-treatment assessment at 12 weeks (6.5% missing). There was also a small percentage of missing data for baseline and adherence measures (0.4 – 2.9% missing), and missing data was imputed using Multiple Imputation in SPSS 23. After examining the missing data, 20 datasets were imputed (Graham, Olchowski, & Gilreath, 2007).

Plan of analysis.—Although youth were nested within therapists, intraclass correlations were low (ICCs < .10), so ratings were determined to be independent and multilevel models were not used. The first aim explored predictors of adherence, so four multiple regressions were conducted (one for each predictor domain: demographic, clinical, therapy-rated, family/parental psychopathology) to identify significant predictors of attendance. Four additional multiple regressions were conducted each for predictors of therapist-rated compliance and homework completion. The second aim examined associations between adherence and youth anxiety outcomes after 12 weeks of treatment. Three regressions with all three indicators of adherence (number of sessions attended, therapist-rated compliance, homework completion) were conducted, controlling for youth age, sex, race, family SES, treatment condition, site and baseline anxiety severity and functioning. Linear regressions were used for continuous outcomes (PARS, CGAS) and logistic regression was used for CGI-I response status (dichotomous).

Results

Descriptive Statistics

Means and standard deviations for all measures are presented in Table 1. Descriptive statistics were calculated prior to multiple imputation. On average, children attended 10 out of 12 possible child therapy sessions, reflecting the low early termination rates from both conditions (4.3% CBT and 9.3% COMB). Over 90% attended at least 8 sessions, and 35.1% completed all 12 sessions; only 2.2% attended 1 session. CBT therapists reported mean compliance rating of 5.58 (SD =1.15). In terms of homework completion (STIC tasks and/or exposures), 31.5% of children completed at least 1 therapy activity at home prior to all of their sessions, whereas 8.8% did not complete any therapy activities outside of sessions. The three adherence indicators (number of sessions attended, therapist-rated compliance, and homework completion) were significantly correlated with each other ($r = .20$ to $.34$, $p < .01$). The magnitude was modest, suggesting some independence among these variables.

Predictors of Adherence

Demographic predictors.—There were few significant demographic predictors (see Table 2). Children living with both natural parents were more adherent (across all three indicators of adherence; $\beta = .13$ to $.17$, $p < .05$). In addition, children from higher SES families attended more CBT sessions ($\beta = .16$, $p < .01$). No other demographic variables (age, sex, race, ethnicity) predicted adherence.

Youth clinical characteristics.—Youth with fewer externalizing disorders were rated as more compliant($\beta = -.13$, $p < .05$) and completed more homework assignments ($\beta = -.19$, $p < .01$). In contrast, youth with more internalizing disorders were rated as more compliant($\beta = .13$, $p < .05$). None of the other youth clinical characteristics (anxiety symptom severity, global functioning, or principal diagnosis) at baseline predicted adherence.

Therapy-related factors.—Parent pre-treatment expectancy that their children would improve with treatment was significantly associated with youth attending more sessions ($\beta = .18$, $p < .01$). Better therapeutic relationship assessed at the first session significantly predicted higher mean therapist ratings of compliance($\beta = .52$, $p < .01$). None of the therapy-related factors significantly predicted homework completion.

Family and parent factors.—Less parental psychopathology predicted more sessions attended ($\beta = -.21$, $p < .01$). Youth-reports of less family dysfunction (BFAM) was associated with higher therapist ratings of compliance in sessions ($\beta = -.18$, $p < .01$). None of the family or parent factors predicted homework completion.

Effects of Adherence on Treatment Outcomes

In multiple linear regressions with all three adherence variables predicting treatment outcomes (Table 3), only therapist ratings of compliance predicted decreased anxiety symptoms (PARS; $\beta = -.23$, $p < .01$),increased global functioning (CGAS; $\beta = .35$, $p < .01$) and responder status [$OR = .45$ (95% CI = $.31$, $.68$), $p < .01$], at the post treatment assessment.

Discussion

Although CBT is an effective treatment for pediatric anxiety disorders (e.g. Higa-McMillan et al., 2016), youth adherence with treatment is considered to be required for optimizing benefits. This study explored predictors of youth adherence with CBT and the relation between youth adherence and treatment outcomes. The most robust predictors of greater youth adherence were living with both parents and fewer child externalizing disorders. In addition, higher therapist-rated compliance (but not sessions attended or amount of homework completed), was associated with better post treatment outcomes.

Predictors of Youth Adherence with CBT

This study is one of the largest and the first to examine a broad range of predictors of youth adherence with CBT for anxiety, using three definitions of adherence. With respect to demographic variables, children living with both parents were more adherent based on all three adherence measures. Similarly, children in homes with higher family income attended more therapy sessions. A two parent living situation and higher family income likely translate into higher family supports in the household, as families with both parents have more adults available to bring children to therapy sessions and support homework compliance. In addition, higher SES families have more resources to support child attendance and fewer financial and transportation obstacles that are often barriers for single parent and lower income families (Owens et al., 2002). Overall, however, the demographic predictors accounted for 5–10% of the variance in adherence suggesting additional variables should be examined.

With respect to baseline youth clinical characteristics, results indicated that youth with a higher number of comorbid internalizing disorders, such as depression or obsessive compulsive disorder, and those with fewer externalizing disorders, were rated as more adherent by their therapists. It may be that children with more internalizing symptoms (and fewer externalizing symptoms), experience more internal distress and thus higher motivation to engage in therapy to achieve symptom relief. Children with externalizing symptoms such as inattention, impulsivity, and oppositionality may be more likely to be noncompliant with homework assignments, disorganized, have difficulty following through with therapist directions, or they may outright refuse to complete homework. Of note, and consistent with previous studies (Chu & Kendall, 2004; Pina et al., 2003), other child clinical factors such as principal anxiety disorder, severity of anxiety symptoms (CGI-S), and global functioning (CGAS) did not predict adherence. Despite these findings baseline clinical characteristics accounted for small amounts of variance in all three indicators of adherence (2–5%) and many clinical characteristics (such as baseline anxiety severity and functioning) were not predictive of treatment adherence.

In contrast to demographics and baseline child clinical characteristics, therapy-related predictors, in particular therapeutic relationship, accounted for a substantial amount of variance (30%) in therapist-rated compliance (but was not related to number of sessions attended or homework completed). Since the therapist rated both the initial therapeutic relationship and compliance at each session, this association is not surprising and may be inflated. Although there may be biases with this association, the importance of the

therapeutic relationship for youth adherence with treatment (and outcomes) is also theoretically supported and the bedrock of most approaches to psychotherapy (Shirk & Karver, 2003). These findings support this theory indicating that the more therapists perceived a positive therapeutic relationship early in treatment, the more the youth was rated by the therapist as treatment compliant throughout treatment. Another therapy-related predictor was parental beliefs that their children would improve with treatment, which significantly predicted greater number of sessions attended. Parents are often responsible for bringing children to therapy, and parents who perceive that treatment will be beneficial are more likely to bring their children to therapy sessions.

With respect to parent and family factors, these variables accounted for very little of the variance in adherence (1–5%). When examining individual parent and family predictors, less parental psychopathology was associated with more therapy sessions attended. Since parents are typically responsible for bringing children to therapy sessions, this finding that parental psychopathology predicts session attendance is consistent with prior research (Nock et al., 2007; Pellerin et al., 2010). Also, youth-reports of less family dysfunction were associated with higher therapist ratings of compliance. Perhaps when children perceive less stress at home, they are more likely to be able to participate in therapy activities (Kazdin, Holland, & Crowley, 1997).

Overall, the current findings provide support for Kazdin's barriers to treatment model (Kazdin et al., 1997),which proposes that barriers to treatment, such as stressors and obstacles that impede participation (e.g. parental stress and psychopathology, accessibility of treatment setting, parent expectations about treatment effectiveness) and issues with treatment demands better explain adherence in youth therapy rather than demographic or clinical characteristics of the child/adolescent.Therefore, therapists should take into consideration the living situation of families and stressors that families without both parents in the household may encounter that impede treatment adherence. In addition, parent factors such as parental psychopathology and parent expectations about treatment were significantly associated with session attendance, and highlight the importance of supporting parents when promoting youth adherence with CBT.Although type of primary anxiety diagnosis and anxiety symptom severity did not predict youth adherence with CBT, number of internalizing and externalizing disorders did, suggesting that addressing symptoms of inattention, impulsivity, and/or defiance may increase youth adherence with treatment for anxiety, even when anxiety is considered the primary, or most impairing, disorder. Finally, while the initial therapeutic relationship predicted therapist ratings of youth adherence, additional research is needed to clarify and understand the processes through with therapists may promote youth adherence through the therapeutic relationship.

Youth Adherence and Treatment Outcomes

A critical question related to youth adherence is whether more is better, with respect to treatment outcomes. Data on this relation in the literature is mixed–with variations in findings due in part to how youth adherence has been defined.To address this limitation, the current study examined three indicators of youth adherence, yet, only one of the three adherence variables was related to treatment outcomes. Specifically, only therapist-rated

compliance was a predictor of outcomes, accounting for up to 13% of the variance in outcomes above and beyond the variance explained by demographic control variables such that children rated as more compliant with therapy tasks (both within and outside of treatment sessions) were more likely to be treatment responders, had lower anxiety severity, and increased global functioning at post treatment. These findings are consistent with previous studies that have examined attendance and therapist-rated compliance together, and found that therapist ratings of compliance, but not attendance predicts treatment outcomes (e.g. Garvey, Julion, Fogg, Kratovil, & Gross, 2006; Nix et al., 2009). One "take home" message is that since CBT involves skill development and practice, it is especially important for children to actively participate and follow through with therapy activities throughout treatment (Chu & Kendall, 2004).

Limitations and Future Directions

Results should be interpreted in the context of limitations. Overall, this study was notable for high treatment completion and attendance rates, which may have reduced the ability to detect some associations due to the restricted range and limited variability of adherence scores. This study used therapist ratings for one measure of adherence and one of the predictors (initial therapeutic relationship), which may have influenced these relations. It is possible that therapists' perception of a more positive therapeutic relationship may bias them to rate the child/adolescent as more compliant. Youth ratings of therapeutic relationship at the initial session were not assessed, but should be included in future studies. Also, future studies should include observer ratings of compliance, which would reduce the issue of shared method variance. Furthermore, the therapist rating of compliance includes ratings of engagement, which are overlapping constructs that may also have differences. For example, treatment engagement may also include readiness for treatment (Becker et al., 2015), but the distinction between compliance and engagement could not be disentangled is this study and warrant exploration in future research. Although this study focused on youth adherence, it was acknowledged that parents can play a role in youth adherence with treatment. Future studies could explore the adherence of parents in supporting youth adherence. In addition, therapists may have assigned differing amounts and levels of difficulty of homework, which may have influenced youth adherence.

There may be predictors of adherence that were not measured, such as therapist demographics, therapist experience, or parent and youth perceptions of the accessibility of services. This study focused on baseline and initial therapy predictors of youth adherence, however, there may be factors during treatment (e.g. changes in therapeutic relationship, changes in symptom severity) that contribute to adherence, and these time-varying factors should be examined in future studies.

The primarily Caucasian, non-Hispanic, high SES sample living with both parents may limit variability in some measures and restricts the generalizability of findings.Cultural differences in the perception of mental health and treatment may impact adherence and treatment outcomes. In addition, youth from lower SES families or not living with both parents may face additional challenges that reduce adherence, which should be explored further with a more diverse sample. This study found that adherence was associated with

treatment outcomes, so it is necessary to examine adherence in samples with greater risks as those findings may inform interventions to increase adherence and thus treatment outcomes.Given the small percentage of racial minority youth in this study, the measure of race was dichotomized and racial minorities were grouped together; however, there may be different associations with adherence for different racial groups that this study was unable to explore.

Clinical Implications

Many interventions for treatment adherence have focused on increasing attendance (e.g. appointment reminders, promoting accessibility to services; Lindsey et al., 2014).The current findings suggest that attending sessions is not sufficient for positive treatment outcomes, particularly for youth anxiety treatment. Rather, overall youth adherence with therapy, including engagement and participation in skill development in session as well as practicing these skills, is associated with positive treatment outcomes. Therefore, future research should examine interventions that target promoting youth behaviors of engaging and participating in therapy activities. There are important implications of these findings for therapists to employ strategies that promote youth engagement and involvement in therapy activities. Also, this study identified predictors that may be targeted in interventions to increase youth adherence with therapy. For example, interventions can incorporate strategies for addressing barriers to treatment adherence, such as those associated with living with a single parent, low expectations about treatment, support for parental psychopathology and family stress, and management of externalizing behaviors (e.g. Chronis, Gamble, Roberts, & Pelham, 2006; Miller & Rollnick, 2002). Further exploration of supports for these predictors of adherence and whether they have a positive impact on treatment outcomes is needed.

Acknowledgments

References

American Psychiatric Association (APA) (2000). Diagnostic and statistical manual of mental disorders (4th ed., text revision). Washington, DC: American Psychiatric Association.

Becker KD, Lee BR, Daleiden EL, Lindsey M, Brandt NE, & Chorpita BF (2015). The common elements of engagement in children's mental health services: Which elements for which outcomes? Journal of Clinical Child & Adolescent Psychology, 44(1), 30–43. [PubMed: 23879436]

Beesdo K, Knappe S, & Pine DS (2009). Anxiety and anxiety disorders in children and adolescents: developmental issues and implications for DSM-V. Psychiatric Clinics of North America, 32(3), 483–524. [PubMed: 19716988]

Bloomquist ML, & Harris WG (1984). Measuring family functioning with the MMPI: A reliability and concurrent validity study of three MMPI scales. Journal of Clinical Psychology, 40, 1209–1214. [PubMed: 6490919]

Chronis AM, Gamble SA, Roberts JE, & Pelham WE (2006). Cognitive-behavioral depression treatment for mothers of children with attention-deficit/hyperactivity disorder. Behavior Therapy, 37(2), 143–158. [PubMed: 16942968]

Chu BC, & Kendall PC (2004). Positive association of child involvement and treatment outcome within a manual-based cognitive-behavioral treatment for children with anxiety. Journal of Consulting and Clinical Psychology, 72(5), 821–829. [PubMed: 15482040]

Compton SN, Peris TS, Almirall D, Birmaher B, Sherrill J, Kendall PC, ... & Piacentini JC (2014). Predictors and moderators of treatment response in childhood anxiety disorders: Results from the CAMS trial. Journal of Consulting and Clinical Psychology, 82(2), 212 – 224. [PubMed: 24417601]

Compton SN, Walkup JT, Albano AM, Piacentini JC, Birmaher B, Sherrill JT, ... & Iyengar S (2010). Child/adolescent anxiety multimodal study (CAMS): Rationale, design, and methods. Child and Adolescent Psychiatry and Mental Health, 4(1), 1–15. [PubMed: 20051130]

Davis III TE, Ollendick TH, & Nebel-Schwalm M (2008). Intellectual ability and achievement in anxiety-disordered children: A clarification and extension of the literature. Journal of Psychopathology and Behavioral Assessment, 30(1), 43–51.

Derogatis LR (1993). Brief Symptom Inventory: Administration, scoring, and procedures manual Minneapolis, MN: National Computer Systems.

Derogatis LR, & Melisaratos N (1983). The Brief Symptom Inventory: An introductory report. Psychological Medicine, 13, 595–605. [PubMed: 6622612]

Dumas JE, Nissley-Tsiopinis J, & Moreland AD (2007). From intent to enrollment, attendance, and participation in preventive parenting groups. Journal of Child and Family Studies, 16(1), 1–26.

Edlund MJ, Wang PS, Berglund PA, Katz SJ, Lin E, & Kessler RC (2002). Dropping out of mental health treatment: patterns and predictors among epidemiological survey respondents in the United States and Ontario. American Journal of Psychiatry, 159, 845–851. [PubMed: 11986140]

Garcia JA, & Weisz JR (2002). When youth mental health care stops: therapeutic relationship problems and other reasons for ending youth outpatient treatment. Journal of Consulting and Clinical Psychology, 70(2), 439–443. [PubMed: 11952203]

Garvey C, Julion W, Fogg L, Kratovil A, & Gross D (2006). Measuring participation in a prevention trial with parents of young children. Research in Nursing & Health, 29(3), 212–222. [PubMed: 16676341]

Graham JW, Olchowski AE, & Gilreath TD (2007). How many imputations are really needed? Some practical clarifications of multiple imputation theory. Prevention Science, 8(3), 206–213. [PubMed: 17549635]

Green B, Shirk S, Hanze D, & Wanstrath J (1994). The Children's Global Assessment Scale in clinical practice: an empirical evaluation. Journal of the American Academy of Child and Adolescent Psychiatry, 38, 1158–1164.

Guy W (1976). The Clinical Global Impressions. In Guy W (Ed.), ECDEU assessment manual for psychopharmacology–Revised (pp. 218–222). Rockville, MD: NIMH.

Higa-McMillan CK, Francis SE, Rith-Najarian L, & Chorpita BF (2016). Evidence base update: 50 years of research on treatment for child and adolescent anxiety. Journal of Clinical Child & Adolescent Psychology, 45(2), 1–23. [PubMed: 26743331]

Hollingshead AB (1971). Commentary on the indiscriminate state of social class measurement. Social Forces, 49, 563–567.

Hudson JL, & Kendall PC (2002). Showing you can do it: Homework in therapy for children and adolescents with anxiety disorders. Journal of Clinical Psychology, 58(5), 525–534. [PubMed: 11967878]

Hughes AA, & Kendall PC (2007). Prediction of cognitive behavior treatment outcome for children with anxiety disorders: Therapeutic relationship and homework compliance. Behavioural and Cognitive Psychotherapy, 35(4), 487–494.

Hughes AA, Lourea-Waddell B, & Kendall PC (2008). Somatic complaints in children with anxiety disorders and their unique prediction of poorer academic performance. Child Psychiatry and Human Development, 39(2), 211–220. [PubMed: 17786552]

James AA, Soler A, & Weatherall RR (2005). Cognitive behavioural therapy for anxiety disorders in children and adolescents. Cochrane Database of Systematic Reviews, Issue 5.

Kardas P, Lewek P, & Matyjaszczyk M (2013). Determinants of patient adherence: a review of systematic reviews. Frontiers in Pharmacology, 4(91), 10–16. [PubMed: 23403503]

Kazantzis N, Deane FP, & Ronan KR (2000). Homework assignments in cognitive and behavioral therapy: A Meta-Analysis. Clinical Psychology: Science & Practice, 7(2), 189–202.

Kazdin AE, Holland L, & Crowley M (1997). Family experience of barriers to treatment and premature termination from child therapy. Journal of Consulting and Clinical Psychology, 65(3), 453–463. [PubMed: 9170769]

Kendall PC, & Hedtke K (2006). Cognitive-behavioral therapy for anxious children: Therapist manual (3rd edition). Ardmore, PA: WorkbookPublishing.

Kendall PC, & Sugarman A (1997). Attrition in the treatment of childhood anxiety disorders. Journal of Consulting and Clinical Psychology, 65(5), 883–888. [PubMed: 9337507]

Kendall PC, Choudhury M, Hudson J, & Webb A (2002). The C. A. T. project therapist manual Ardmore, PA: Workbook Publishing.

Lindsey MA, Brandt NE, Becker KD, Lee BR, Barth RP, Daleiden EL, & Chorpita BF (2014). Identifying the common elements of treatment engagement interventions in children's mental health services. Clinical Child and Family Psychology Review, 17(3), 283–298. [PubMed: 24379129]

Lyneham HJ, Abbott MJ, & Rapee RM (2007). Inter-rater reliability of the Anxiety Disorders Interview Schedule for DSM-IV: child and parent version. Journal of the American Academy of Child and Adolescent Psychiatry, 46, 731–737. [PubMed: 17513985]

McNicholas F (2012). To adhere or not, and what we can do to help. European Child & Adolescent Psychiatry, 21(12), 657–663. [PubMed: 22944908]

Miller LM, Southam-Gerow MA, & Allin RB Jr (2008). Who stays in treatment? Child and family predictors of youth client retention in a public mental health agency. Child & Youth Care Forum, 37(4), 153–170. [PubMed: 19774098]

Miller WR, & Rollnick S (2002). Motivational interviewing: Preparing people for change New York, NY: Guilford.

Nix RL, Bierman KL, McMahon RJ, & Conduct Problems Prevention Research Group (2009). How attendance and quality of participation affect treatment response to parent management training. Journal of Consulting and Clinical Psychology, 77(3), 429–438. [PubMed: 19485585]

Nock MK, & Ferriter C (2005). Parent management of attendance and adherence in child and adolescent therapy: A conceptual and empirical review. Clinical Child and Family Psychology Review, 8(2), 149–166. [PubMed: 15984084]

Nock MK, Ferriter C, & Holmberg E (2007). Parent beliefs about treatment credibility and effectiveness: Assessment and relation to subsequent treatment participation. Journal of Child and Family Studies, 16(1), 27–38.

Owens PL, Hoagwood K, Horwitz SM, Leaf PJ, Poduska JM, Kellam SG, & Ialongo NS (2002). Barriers to children's mental health services. Journal of the American Academy of Child & Adolescent Psychiatry, 41(6), 731–738. [PubMed: 12049448]

Pellerin KA, Costa NM, Weems CF, & Dalton RF (2010). An examination of treatment completers and non-completers at a child and adolescent community mental health clinic. Community Mental Health Journal, 46(3), 273–281. [PubMed: 20146097]

Pina AA, Silverman WK, Weems CF, Kurtines WM, & Goldman ML (2003). A comparison of completers and noncompleters of exposure-based cognitive and behavioral treatment for phobic and anxiety disorders in youth. Journal of Consulting and Clinical Psychology, 71(4), 701–705. [PubMed: 12924675]

Podell JL, Kendall PC, Gosch EA, Compton SN, March JS, Albano AM, ... & Keeton CP (2013). Therapist factors and outcomes in CBT for anxiety in youth. Professional Psychology: Research and Practice, 44(2), 89–98.

Reinhard SC, Gubman GD, Horwitz AV, & Minsky S (1994). Burden Assessment Scale for families of the seriously mentally ill. Evaluation & Program Planning, 17, 261–269.

Research Units on Pediatric Psychopharmacology Anxiety Study Group (2002). The Pediatric Anxiety Rating Scale (PARS): development and psychometric properties. Journal of the American Academy of Child and Adolescent Psychiatry, 41, 1061–1069. [PubMed: 12218427]

Sabaté E (2003). Adherence to long-term therapies: Evidence for action World Health Organization.

Shaffer D, Gould M, Brasic J, Ambrosini P, Fisher P, & Bird, et al. (1983). A Children's Global Assessment Scale. Archives of General Psychiatry, 40, 1228–1231. [PubMed: 6639293]

Shirk SR, & Karver M (2003). Prediction of treatment outcome from relationship variables in child and adolescent therapy: a meta-analytic review. Journal of Consulting and Clinical Psychology, 71(3), 452–464. [PubMed: 12795570]

Silverman WK, Saavedra LM, & Pina AA (2001). Test-retest reliability of anxiety symptoms and diagnoses with the Anxiety Disorders Interview Schedule for *DSM–IV*: Child and parent versions. Journal of the American Academy of Child & Adolescent Psychiatry, 40, 937–944. [PubMed: 11501694]

Silverman W, & Albano AM (1996). The Anxiety Disorders Interview Schedule for DSM–IV: Child and parent versions San Antonio, TX: The Psychological Corporation.

Skinner H, Steinhauer P, & Santa-Barbara J (1995). Family Assessment Measure III (FAM–III) North Tonawanda, NY: Multi-Health Systems.

Southam-Gerow MA, Kendall PC, & Weersing VR (2001). Examining outcome variability: Correlates of treatment response in a child and adolescent anxiety clinic. Journal of Clinical Child Psychology, 30(3), 422–436. [PubMed: 11501258]

Walkup JT, Albano AM, Piacentini J, Birmaher B, Compton SN, Sherrill JT, ... & Kendall PC (2008). Cognitive behavioral therapy, sertraline, or a combination in childhood anxiety. New England Journal of Medicine, 359(26), 2753–2766. [PubMed: 18974308]

White SW, Ollendick T, Albano AM, Oswald D, Johnson C, Southam-Gerow MA, ... & Scahill L (2013). Randomized controlled trial: multimodal anxiety and social skill intervention for adolescents with autism spectrum disorder. Journal of Autism and Developmental Disorders, 43(2), 382–394. [PubMed: 22735897]

Zaider TI, Heimberg RG, Fresco DM, Schneier FR, & Liebowitz MR (2003). Evaluation of the Clinical Global Impression Scale among individuals with social anxiety disorder. Psychological Medicine, 33, 611–622. [PubMed: 12785463]

Table 1.

Means, Standard Deviations, and Ranges for all Variables

	Mean (SD)	Range
Adherence		
No. sessions attended	10.2 (2.34)	1.00 – 12.00
Therapist-rated compliance	5.58 (1.15)	1.40 – 7.00
Homework completed	.75 (.30)	.00 – 1.00
Predictors		
Demographic		
Age (years)	11.25 (2.83)	7 – 17.8
Sex	51.6% female, 48.4% male	
Race	79.6% White, 9% Black, 2.5% Asian, 1.4% American Indian, .4% Native Hawaiian/Pacific Islander, 7.2% other	
Ethnicity	13.3% Hispanic, 86.7% non-Hispanic	
Socioeconomic status	24.4% SES 1–3, 75.6% SES 4–5	
Whom youth living with	73.1% both natural parents, 26.9% not both natural parents	
Clinical		
CGI-S	5.06 (.72)	4 – 7
Total internalizing disorders	45.6% with internalizing disorders other than separation anxiety, social phobia, or generalized anxiety disorder	
Total externalizing disorders	18.7% with externalizing disorders	
Principal diagnosis	21.5% separation anxiety disorder, 43.7% social phobia, 34.8% generalized anxiety disorder	
Therapy-related factors		
Child pretreatment expectancy[1]	5.75 (1.23)	1 – 7
Parent pretreatment expectancy[1]	6.08 (.79)	3 – 7
Initial therapeutic relationship	5.28 (1.3)	1 – 7
Family/parental psychopathology		
BSI total	27.0 (22.3)	0 – 124
BAS total	47.9 (14.1)	21 – 92
BFAM child total	14.4 (5.51)	1 – 29
BFAM parent total	11.6 (5.34)	0 – 30
Outcomes		
PARS total baseline	19.3 (4.07)	7 – 29
PARS total 12 week	8.69 (6.13)	0 – 26
CGAS baseline	50.6 (7.33)	30 – 71
CGAS 12 week	67.3 (10.8)	30 – 91
CGI-I responder	74.7% responder, 25.3% non-responder[2]	

Note. CGI-S = Clinical Global Impressions Scale – Severity, BSI = Brief Symptom Inventory, BAS = Burden Assessment Scale, BFAM = Brief Family Assessment Measure, PARS = Pediatric Anxiety Rating Scale, CGAS = Children's Global Assessment Scale, CGI-I = Clinical Global Impressions – Improvement.

[1]To ease interpretation, Child and Parent pretreatment expectancy were reverse scored from 1 very much worse to 7 very much improved, whereas papers such as Compton et al., 2014 used the rating from 1 very much improved to 7 very much worse.

[2]Current rates of treatment response are based on raw data at 12 weeks and exhibit slight difference with Walkup et al., 2008, which used Last Observation Carried Forward to account for missing data in reporting treatment response.

Table 2.

Multiple Regressions Predicting Adherence to CBT

	No. sessions attended			Therapist-rated compliance			Homework completed		
	F	R²	β	F	R²	β	F	R²	β
BL Demographic	5.0**	.10**		2.6*	.05*		2.4*	.05*	
Age (years)			−.07			−.04			−.02
Sex			−.02			−.10			.04
Race			.11			.06			.04
Ethnicity			−.06			.01			−.02
Socioeconomic status			.16**			.09			.10
Whom child living w/			.15*			.13*			.17**
BL Clinical	.86	.02		2.2	.04		2.8*	.05*	
CGI-S			.02			−.04			.13
CGAS			.02			.07			.09
Total internalizing disorders			.07			.13*			.04
Total externalizing disorders			−.10			−.13*			−.19**
Principal diagnosis			−.01			.00			.04
BL Therapy-related factors	3.9*	.04*		40**	.30**		1.7	.02	
Child pretreatment expectancy			.06			.09			.06
Parent pretreatment expectancy			.18**			.03			.07
Initial therapeutic relationship			.02			.52**			.08
Family/parental psychopathology	3.3*	.05*		2.6*	.04*		.82	.01	
BSI total			−.23**			−.07			−.11
BAS total			.01			.03			.06
BFAM child			.02			−.18**			.02
BFAM parent			.03			.01			−.01

Note. CGI-S = Clinical Global Impressions Scale – Severity, CGAS = Children's Global Assessment Scale, BSI = Brief Symptom Inventory, BAS = Burden Assessment Scale, BFAM = Brief Family Assessment Measure.

*
$p < .05$

**
$p < .01$

Table 3.

MultipleRegressions Predicting Child Outcomes with Adherence

Linear Regressions	PARS total			CGAS		
	F	R²	β	F	R²	β
Step 1 Control variables	9.6**	.20**		8.1**	.17**	
Step 2	12**	.12**		12**	.13**	
Step 2 No. of sessions attended			−.14			.00
Step 2 Therapist-rated compliance			−.23**			.35**
Step 2 Homework completed			−.10			.04

Logistic Regressions	CGI-I Response			
	B	P	Odds Ratio	95% CI
No. sessions attended	−.44	.17	.64	[.34, 1.21]
Therapist-rated compliance	−.79**	.00	.45	[.31, .68]
Homework completed	−.31	.10	.74	[.51, 1.05]

Note. Analyses control for baseline score on the treatment outcome, child age, sex, race, family socioeconomic status, treatment condition, and site.

Note. PARS = Pediatric Anxiety Rating Scale, CGAS = Children's Global Assessment Scale, CGI-I = Clinical Global Impressions – Improvement: 0 = responder (CGI-I = 1 or 2), 1 = non-responder.

*
$p < .05$

**
$p < .01$