The Efficacy of Psychodynamic Psychotherapy Compared to Cognitive Behavioral Therapy and Drug Counseling for Substance Use Disorders: A Systematic Review and Meta-Analysis

Morris D. Franco, MA, MS

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The Efficacy of Psychodynamic Psychotherapy Compared to Cognitive Behavioral Therapy and Drug Counseling for Substance Use Disorders: A Systematic Review and Meta-Analysis

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Thank you to all who helped me get here. I appreciate you immensely, more than you can know. I hope to make you proud. I hope to pass it on. Thank you.
Abstract

In 2021, drug overdoses were the leading cause of death in the US for those under age 50, with a toll of 100,306 lives, an increase of 28.5% from 2020 (Center for Disease Control, 2021). This increasing toll makes it imperative to identify effective research-based treatments. Psychodynamic psychotherapy (PDT) is an option for treating substance-use disorder (SUD); however, few studies have examined its effectiveness. This meta-analysis builds on Warshaw’s 2022 meta-analysis of studies on the efficacy of PDT in treating SUDs. We conducted a between-groups analysis of randomized controlled trials, analyzing post-treatment and follow-up differences between PDT and cognitive behavioral therapy (CBT), and between PDT and drug counseling. Moderators included researcher allegiance, use of medication, and amount of intervention. The potential benefits of this study include a better understanding of the comparative efficacy of commonly used treatments and further insights into a type of treatment that is not as frequently studied. The outcomes of this meta-analysis revealed no substantial variability in treatment efficacy, thereby substantiating the central hypothesis positing PDT’s equivalence to CBT and drug counseling in addressing substance-use disorders ($d = 0.088$). The analysis of moderators failed to attain statistical significance regarding adjunct pharmacological treatment, RA, or treatment duration. The small overall sample size of the number of studies in the meta-analysis may have accounted for the lack of significant findings within the moderator analysis. All publication bias analyses were not statistically significant, suggesting it is unlikely that issues of publication bias impacted study results.
**TABLE OF CONTENTS**

<table>
<thead>
<tr>
<th>SECTION</th>
<th>PAGE NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>TITLE PAGE</td>
<td>1</td>
</tr>
<tr>
<td>ACKNOWLEDGMENTS</td>
<td>2</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>3</td>
</tr>
<tr>
<td>TABLE OF CONTENTS</td>
<td>4</td>
</tr>
<tr>
<td>LIST OF TABLES AND FIGURES</td>
<td>5</td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td>6</td>
</tr>
<tr>
<td>LITERATURE REVIEW</td>
<td>6</td>
</tr>
<tr>
<td>Present Study and Hypotheses</td>
<td>17</td>
</tr>
<tr>
<td>METHOD</td>
<td>20</td>
</tr>
<tr>
<td>Eligibility Criteria</td>
<td>20</td>
</tr>
<tr>
<td>Procedure</td>
<td>21</td>
</tr>
<tr>
<td>Data Analysis</td>
<td>23</td>
</tr>
<tr>
<td>RESULTS</td>
<td>24</td>
</tr>
<tr>
<td>Inclusion of Studies</td>
<td>24</td>
</tr>
<tr>
<td>Quantitative Data Synthesis</td>
<td>25</td>
</tr>
<tr>
<td>Publication Bias Analyses</td>
<td>25</td>
</tr>
<tr>
<td>DISCUSSION</td>
<td>26</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>33</td>
</tr>
<tr>
<td>APPENDIX A</td>
<td>43</td>
</tr>
<tr>
<td>APPENDIX B</td>
<td>48</td>
</tr>
<tr>
<td>APPENDIX C</td>
<td>58</td>
</tr>
</tbody>
</table>
APPENDIX D……………………………………………………………………………………66

LIST OF TABLES AND FIGURES

Table 1…………………………………………………………………………………….67
Table 2…………………………………………………………………………………….69
Table 3…………………………………………………………………………………….70
Table 4…………………………………………………………………………………….71
Table 5…………………………………………………………………………………….72
Table 6…………………………………………………………………………………….73
Table 7…………………………………………………………………………………….74
Table 8…………………………………………………………………………………….75
Figure 1……………………………………………………………………………………76
Figure 2……………………………………………………………………………………77
Figure 3……………………………………………………………………………………78
The Efficacy of Psychodynamic Psychotherapy Compared to Cognitive Behavioral Therapy and Drug Counseling for Substance-Use Disorders: A Systematic Review and Meta-Analysis

In 2021, drug overdoses were the leading cause of death in the US for those under age 50, with a toll of 100,306 lives (Center for Disease Control, 2021). This figure was an increase of 28.5% from 2020’s record high of 75,673. Substance abuse is one of the largest public-health issues in the world; over three million people die from alcohol abuse each year, and at least 35 million people worldwide meet the criteria for substance-use disorders (SUDs; WHO, 2019). This increasing toll makes it imperative to identify effective research-based treatment options. Over 4 decades have passed since Lettieri et al. (1980) noted that, while many theories were offered to explain drug use, no one approach was linked to predictable treatment outcomes. Despite the many advances in the field, finding a more effective treatment for SUDs has been a persistent issue.

Literature Review

Psychodynamic Approaches

Dating back to Freud’s original writings, psychoanalytic theory has contributed centrally to the debate about the motives for and treatment of drug abuse. Historically, substance abusers were seen by psychoanalytic theorists as unsuited for the analytic method. However, since the 1980s, modifications of psychoanalytic theory have led to effective psychodynamically-based treatments for drug abusers (Halliday, 1992).

The current best-known psychodynamic explanation of drug use is Khantzian’s (1974) “self-medication” hypothesis. Khantzian (1974) maintained that the primary appeal of drugs lies in their ability to reduce and regulate psychological suffering and that the pleasure-seeking
aspects of drugs are of secondary importance. He argued that classes of drugs have distinctive actions and effects that interact with painful feeling states and psychiatric disturbances and that addicts have a drug of choice that best targets their psychological distress (Khantzian, 1974). For example, heroin may give its users a synthetic feeling of love and warmth they are missing in their daily lives and relationships. This self-medicating dimension of drug use is, in Khantzian’s view, an important motivating factor in becoming dependent on drugs or alcohol.

Other psychoanalytic theorists used slightly different names to describe this same phenomenon, including Freud, who viewed drugs and alcohol as the “drowner[s] of cares” (1930; 1964); Rado, who viewed them as “self-cure[s]” (1933; 1981); and Kohut, who viewed drug abuse as an attempt to “self-cure” self-esteem deficits (1971). Common among these authors is the view that abuse and addiction are best understood as psychological phenomena rooted in psychic conflict or failures of self-regulation, wherein the drug acts as the external agent that can reduce distress and restore equilibrium, even if only temporarily (Halliday, 1992).

The psychodynamic explanation of drug abuse as not just a biological or behavioral problem but as a psychological problem suggests that the treatment for the disorder should essentially be psychological; the approach would focus on the underlying motives and personality functioning that initiate and maintain the drug taking, not just the drug use itself (Halliday, 1992).

This view of addiction is not exclusive to psychoanalysis and can be found at the core of many contemporary, dynamically informed clinical approaches to substance-abuse treatment (Halliday, 1992). There is little empirical data, though, to demonstrate the effectiveness of such a treatment approach, and there remains a need for controlled research in the study of modified psychodynamic approaches to substance abuse (Warshaw, 2022).
There are several reasons why there is relatively little empirical research on psychodynamic psychotherapy (PDT) for SUDs. One primary reason is the dominance of other therapeutic modalities, such as cognitive behavioral therapy (CBT). Additionally, the nature of PDT, which often focuses on exploring deep-seated emotions and unconscious processes, can make it challenging to measure and evaluate using traditional empirical methods. Furthermore, there may be limited funding and resources allocated to researching PDT for SUDs compared to other treatment approaches.

Zilcha-Mano et al. (2018) highlight some of these challenges in their examination of the empirical support for PDT in general. They note that, while there is evidence supporting the effectiveness of PDT for various mental-health conditions, such as depression and anxiety, there is a relative scarcity of research specifically examining its efficacy for SUDs. This study underscores the need for further research into the efficacy of PDT for SUDs to better understand its potential role in treating this complex and challenging condition.

A major barrier to treatment has been the viewpoint from the psychodynamic tradition that substance abusers are unsuited for PDT due to a lack of motivation, immaturity, acting out, poor treatment retention, lacking impulse control, antisocial behavior, and high relapse rates (Zilcha-Mano et al., 2018). Bean (1984), for example, argues that psychotherapy with alcoholics cannot begin until several years of abstinence are achieved, and considers psychotherapy for substance abusers a luxury.

Several psychodynamic theorists have challenged the assumption that dynamic therapy cannot work for addicts. They criticize this assumption as based on inappropriate, unmodified models of treatment and have designed effective psychodynamic modes for SUD treatment. Luborsky (1984) argues that a modified psychodynamic treatment that initially is supportive and
didactic while the patient becomes abstinent and stabilized, guided by an active, educative, and engaged therapist rather than a passive and neutral one, could be effective. After this preparatory period, he argues, an insight-oriented approach can begin. Based on this approach, Luborsky (1984) designed a 12–session, modified supportive-expressive individual treatment for methadone-maintained opiate addicts, focusing exclusively on core conflict relationships. This study found PDT to be an effective treatment option. Building on this study, Halliday (1992) examined a 52–session, supportive-expressive group therapy (a psychodynamically oriented therapy), which was also effective for cocaine abusers.

Gregory et al. (2008) examined the effectiveness of a relatively newer form of PDT called dynamic deconstructive psychotherapy (DDP), specifically designed for engaging challenging patients, including those with co-occurring antisocial personality disorder or SUDs. Grounded in psychodynamic principles, DDP delves into the underlying conflicts and emotions that fuel maladaptive behaviors, aiming for resolution. The findings over a 12–month period showed significant improvements in parasuicide, alcohol misuse, institutional care, core symptoms of borderline personality disorder (BPD), depression, dissociation, and perceived social support among those receiving DDP compared to community care. DDP also demonstrated a higher retention rate, suggesting its potential cost-effectiveness compared to other treatments (Gregory et al., 2008).

In a recent randomized clinical trial, Suchman, DeCoste, Leigh, and Borelli (2017) evaluated the effectiveness of a PDT intervention for mothers in addiction treatment that focused on mentalization. Mentalization refers to the capacity to understand and interpret one’s own and others’ behavior in terms of underlying mental states, such as thoughts, feelings, and intentions. The intervention aimed to enhance mothers’ ability to mentalize and improve their parenting
skills, ultimately promoting better outcomes for both mothers and their children. It included components such as psychoeducation on mentalization, exploration of mother-child interactions, and techniques to promote empathy and emotional regulation in mothers. The study found that, compared to standard addiction treatment alone, the mentalization-based intervention led to improvements in mothers’ mentalization capacities and parenting behaviors and provided further evidence for PDT based approaches.

**Cognitive Behavioral Therapy**

CBT is a leading behavioral approach for intervention with SUDs (Substance Abuse and Mental Health Services Administration, 2014). CBT for SUDs is most often defined as a time-limited, multi-session intervention that targets cognitive, affective, and environmental risks for substance use and provides training in coping skills to help an individual achieve and maintain abstinence or harm reduction goals (McHugh et al., 2010).

A central element of CBT is anticipating likely problems and enhancing patients’ self-control by helping them develop effective coping strategies (McHugh et al., 2010). Specific techniques include exploring the positive and negative consequences of continued drug use, self-monitoring to recognize cravings early and identify situations that may enable or encourage use and developing strategies for coping with cravings and avoiding high-risk situations (McHugh et al., 2010).

Once high-risk situations and events are identified (including people, places, and internal cues, such as changes in affect), CBT can be directed to altering the likelihood that these events are encountered (providing alternative non-drug activities or activities with non-drug-using individuals) and rehearsing non-drug alternatives to these cues (McHugh et al., 2010). Cognitive interventions include increasing motivation for these alternative activities while decreasing
problematic cognitions that enhance the likelihood of drug use (McHugh et al., 2010). Similarly, providing psychoeducation on the nature of such thoughts and the role that they may play in recovery can help patients gain awareness about how such thinking patterns contribute to maintaining the disorder. As with other disorders, rehearsal of cognitive restructuring in drug cues may enhance the availability of these skills outside treatment settings (McHugh et al., 2010).

Qualitative reviews have concluded that CBT is more effective than no treatment but have reported mixed results on key questions such as efficacy over other evidence-based therapies (Magill et al., 2019). While studies have not shown the superiority of CBT over other evidence-based treatments for SUDs, it remains the most widely used behavioral treatment approach for SUDs (Magill et al., 2019). Its widespread use likely stems from its demonstrated effectiveness in reducing substance use and preventing relapse, supported by numerous empirical studies (National Institute on Drug Abuse, 2018). Additionally, CBT’s versatility allows it to be tailored to the individual needs and preferences of clients, making it accessible across various treatment settings and populations (McHugh et al., 2020).

**Individual Drug Counseling**

Traditionally, individual drug counseling (IDC) represents the standard form of outpatient drug-free treatment in the US (Woody et al., 1983). It is offered through one-on-one sessions with an IDC counselor. The qualifications for IDC counselors include a minimum of 3 years of experience and proficiency in the 12-step mode (Woody et al., 1983). The educational backgrounds of counselors can range from high school diplomas to doctorates, with most counselors holding bachelor's or master's degrees in social work, counseling psychology, or related fields (Wood et al., 1983).
The aim of an IDC counselor is to equip clients with practical strategies, such as avoiding triggers, attending support groups, and modifying risky environments. All goals in IDC directly target recovery. Examples of IDC goals include ending enabling relationships or developing healthier coping mechanisms for negative emotions (Woody et al., 1983). The focus in IDC remains on the present, with past experiences acknowledged only in their connection to addiction. This would defer from CBT or PDT, as it excludes any focusing on internal psychological process or delving into the root causes of substance use (Woody et al., 1983).

Various explanations have been given to try to explain IDC’s comparative success compared to more professional psychotherapy approaches such as CBT and PDT. Halliday (1992) suggests that professional treatment itself may not be a critical factor in accounting for changes in drug use; it may be that professional treatment has a negligible effect, while pre-treatment characteristics and other external factors play a larger role (Halliday, 1992). Kazdin (1986) theorizes that, in general, types of psychotherapy treatments should not be expected to differ in effectiveness, not just for SUD but for all types of mental-health struggles, since all psychotherapies offer assistance in the same vital factors: hope, rationale, and a supportive relationship.

The results of a large-scale study by the National Institute on Drug Abuse comparing various treatments for SUDs, including supportive-expressive therapy, CBT, and IDC, found no significant difference between the treatments (Crits-Christoph et al., 1999). Given the equivalence of the treatments in efficacy, the authors of the study suggested that IDC was the treatment of choice among those studied, given the ease of cost, time, and training for IDC compared to CBT and PDT (Crits-Christoph et al., 1999).
Comparison Studies

In 1980, Lettieri et al. noted that, while many theories were offered to explain substance use and abuse, none were linked to predictable nor more favorable outcomes. Despite years of research and advancements in the field, there remains a lack of evidence in favor of any one approach. Further, many of these approaches and theories are often conceptually and practically divergent (Halliday, 1992). This debate often goes beyond the evidence, with supporters of various approaches often favoring their ideologies, which has led to many unexamined assumptions and a lack of empirical data in the field (Halliday, 1992). Other issues include that many literature reviews are based on non-experimental designs, often using inexperienced therapists, small sample sizes, brief interventions, and automated treatments; lacking follow-up studies; and containing other biases in the research designs that make the findings unreliable or difficult to interpret (Halliday, 1992).

Luborsky (1995) attempted to rectify this issue by comparing the results of psychodynamic and behavioral treatments for SUD. The results showed evidence in support of the effectiveness of both psychodynamic and behavioral approaches but concluded that there were no significant differences between the two. Citing the oft-quoted “dodo-bird effect” first coined by Rosenzweig (1936), the researchers suggested that, while all psychotherapies produce some benefits for patients, these effects may be the result of factors common to all therapies and not to the specific treatments themselves. Ultimately, the researchers could not conclude that any approach was particularly effective (Luborsky 1995).

A review by Olson et al. (1981) comparing behavioral treatments and psychodynamic treatment for inpatient alcohol-use disorder (AUD) showed strong and consistent trends favoring the behavioral approach. Both approaches were effective in treating AUD, and the utility of
regular treatment was also supported; however, after 18 months, these results became
comparable across the three treatments, with none showing more effective results.

Woody et al. (1983) examined the effectiveness of a type of PDT called supportive-
expressive psychotherapy and compared it to treatment as usual. One month after the therapy
ended, both groups had made significant gains, and there were no significant differences between
the groups. By a six-month follow-up, however, many of the gains made by the drug counseling
patients had diminished, whereas most gains made by the patients who received supportive
expressive psychotherapy remained or were still evident (Woody et al., 1983). This study not
only provided evidence that supportive expressive psychotherapy can be effectively delivered to
substance abusers and psychiatrically impaired patients in community methadone programs but
favored supportive expressive psychotherapy in terms of long-term gains (Woody et al., 1983).

Halliday (1992) compared dynamic group therapy to behavioral group therapy for the
treatment of cocaine abuse. The evidence was consistent with many past comparison studies,
supporting both forms of treatment as equally effective (Halliday, 1992).

The “dodo-bird effect” gained more supporting evidence in a study by Ojehagen,
Berglund, Appel, Nilsson, and Skjaerris (1991) examining outpatient treatments for AUD.
Ojehagen et al. (1991) looked to compare behavioral and dynamic therapies, and, as had been the
case in prior studies, they found both to be effective; however, there were only small and
inconclusive differences between the therapies of types and different durations.

Sandahl et al. (1998) compared group PDT to CBT for moderately alcohol-dependent
clients and found that at a 15–month follow-up, patients from both treatment orientations had
improved with similar effectiveness in both groups. However, similar to the findings by Woody
et al. (1983), most of the patients in the psychodynamic group treatment could maintain a more
positive drinking pattern during the follow-up period compared to the patients in the cognitive behavioral treatment, who seemed to gradually deteriorate (Sandahl et al., 1998).

Crits-Christoph et al. (1999) compared treatment for cocaine abusers, comparing supportive expressive psychotherapy to cognitive therapy (CT) and IDC. Each group also received group drug counseling (GDC) in addition to their respective treatments. At first, the researchers found results that indicated that IDC paired with GDC was the most effective treatment option. Two other potential interacting factors were tested in the Crits-Christoph et al. (1999) study: whether supportive expressive psychotherapy would be more effective than other treatments for clients with other psychiatric symptoms, and whether CT would be more effective for clients with antisocial symptoms. In general, the sample displayed low psychiatric severity (the mean ASI-Psychiatric Severity Composite score was .19) and did not include patients concurrently on psychotropic medication (Crits-Christoph et al., 1999). Of the sample size, 14% of the patients met the full criteria for antisocial personality disorder, and another 31.8% met the criteria for an antisocial personality disorder as adults with no history of childhood conduct disorder. Supportive expressive psychotherapy was not superior among patients with comorbid psychiatric symptoms, nor was any evidence found that CT, relative to the other treatments, was more effective for patients with antisocial personality traits. Overall, clients with more psychiatric symptoms achieved poorer outcomes in all treatments than did clients with fewer psychiatric symptoms (Crits-Christoph et al., 1999).

However, in follow-up studies (Crits-Christoph et al., 2001; Crits-Christoph et al., 2008), the results were more consistent with previous findings, showing the comparative effectiveness of all treatment options. The researchers did report some interesting findings, including results that showed evidence of a tendency for greater improvement in family or social problems for
patients receiving supportive expressive psychotherapy with GDC compared to those receiving IDC with GDC (Crits-Christoph et al., 2008). At the same time, fewer patients receiving supportive expressive psychotherapy with GDC, compared to those receiving IDC with GDC, achieved early abstinence with maintenance of gains (Crits-Christoph et al., 2008).

In a more recent comparison study examining the effectiveness of PDT, Philips, Wennberg, Konradsson, and Franck (2018) investigated the feasibility of using mentalization-based treatment (MBT) for individuals concurrently experiencing BPD and SUDs. Conducting a randomized controlled feasibility study, the researchers aimed to assess the practicality and potential effectiveness of MBT in this population. The study found that while MBT showed promise in reducing suicide attempts, it did not significantly outperform standard treatment on various self-report and interview measures (Philips et al., 2018).

Overall, most of these studies (Crits-Cristoph et al., 2008; Halladay, 1992; Luborsky, 1995; Philips et al., 2018; Ojehagen et al., 1991; Olson et al., 1981) shared a common theme of finding equivalent results when comparing treatments and ultimately supported the “dodo bird” hypothesis. There were some exceptions to this, namely two studies that seemed to initially show equivalent results, but ultimately favored PDT, specifically in terms of maintaining long-term gains at follow-up (Sandahl et al., 1998; Woody et al., 1983), and one study that initially favored IDC for short-term gains (Crits-Cristoph et al., 2001); however, upon further review, supported equivalency among the treatments (Crits-Cristoph et al., 2008).

In terms of meta-analysis for PDT treatment of SUDs, the research is sparse. Wompold and Imel (2015) suggest that the dearth of research could be explained by a complex and controversial history of SUD treatment, along with outdated methodological procedures in the studies that were completed. A meta-analysis by Imel et al. (2008) found positive outcomes for
psychodynamic treatment and alcohol use. However, this study only focused on alcohol use outcomes, where only one study has looked at psychodynamic treatment across substance-use problems, Warshaw et al. (2022) which found evidence supporting PDT as an effective treatment for SUDs. This sparsity, along with the positive results of their study, emphasizes the need for further examination of RCTs for PDT treatment of SUDs. Specifically, up to the date of our research, there have been no meta-analyses examining the outcomes of PDT for SUD compared to other treatments.

**Current Study**

Warshaw (2022) recently examined the effectiveness of PDT for the treatment of SUDs. They used meta-analysis to examine the pre-post change in outcomes of PDT treatment in both randomized controlled trials (RCTs) and naturalistic studies. According to their results, the evidence supports PDT as an effective treatment for SUDs. Building on Warshaw’s (2022) study, we sought to examine the efficacy of PDT treatment for SUDs in comparison to other commonly used treatments through using meta-analysis. Warshaw’s study was the first to examine the efficacy of PDT treatment for SUDs in a meta-analysis. In Warshaw’s (2022) study, the most common comparison groups for PDT were CBT and drug counseling. Whereas Warshaw (2022) examined pre-post changes for the PDT group, we conducted a between-groups analysis, analyzing post-treatment and follow-up differences between PDT and CBT and drug counseling on the other. All RCTs of PDT for SUDs were eligible for review; specifically, we examined those that compared PDT to either CBT or drug counseling. We also examined the moderating effects of therapeutic allegiance, the number of intervention hours, and using medication on treatment outcomes.
In the present study, we hypothesized that PDT, CBT, and drug counseling would all be effective in treating SUDs. More specifically, we predicted that participants who received PDT, CBT, and drug counseling would demonstrate equivalent results in a between-groups analysis, analyzing post-treatment and follow-up differences between PDT on the one hand and CBT and drug counseling on the other. The present study conducted three primary moderator analyses based on a priori hypotheses derived from previous research (details for each hypothesis are provided below): (a) research allegiance, (b) use of pharmacological interventions in addition to treatment, and (c) number of intervention hours.

In terms of our moderator of researcher allegiance (RA), we based our hypothesis on the results of Munder et al.’s (2011) study. In this meta-analysis, the researchers investigated moderating and mediating factors for RA, a theory put forth by Luborsky (1995). They hypothesized that the results of outcome differences in comparison studies were more likely to be due to the researcher’s preference for a particular treatment (which they called “RA”) than to differences in the efficacy of the treatments themselves. In a review of 79 comparison studies of psychotherapies for depression and post-traumatic stress disorder, Munder et al. (2011) found that RA factored into treatment results and that methodological quality (MQ) acted as a moderator for RA, wherein the RA-outcome association was stronger when the MQ was low. The results support the view that RA generally acts as a bias in treatment comparisons, favoring the treatment the particular researcher aligns with. Based on these results, we predicted that RA toward a particular therapeutic intervention would demonstrate greater between-group differences favoring that particular intervention.

For the moderator of using adjunct pharmacological interventions, we based our hypothesis on the results of meta-analyses by Irvin, Bowers, Dunn, and Wang (1999), Magill and
Ray (2009), and Ray et al. (2020). In the meta-analysis by Irvin et al. (1999), the researchers reviewed the efficacy of a behavioral treatment called relapse prevention when used for individuals with SUD. According to the results, pairing the treatment with adjunctive use of medication focused on reducing craving and withdrawal symptoms enhanced overall treatment effectiveness, with effect sizes roughly 5 times higher when the treatment was combined with medication than when the treatment was used alone. In a follow-up meta-analysis by Magill and Ray (2009), 53 CBT trials were reviewed, which revealed similar results that showed the combination of CBT and medication use to be beneficial over CBT alone (although with a smaller effect size difference).

In another follow-up meta-analysis by Ray et al. (2020), the researchers reviewed various evidence-based treatments in conjunction with pharmacotherapy, including CBT, interpersonal therapy, GDC, and IDC. The researchers did not find evidence for the superiority of any one specific evidence-based treatment in combination with pharmacotherapy, although they did find general benefits for the combination of evidence-based treatments with pharmacological interventions. Based on these studies, we predicted that adjunctive use of pharmacological interventions in both groups would be associated with smaller between-group differences, and that the adjunctive use of pharmacological interventions in one group would be associated with greater between-group differences following that particular intervention.

Length of stay has long been thought to play a large role in treatment, with many studies reporting that patients who stay in treatment longer or attend more sessions have better post-treatment outcomes than patients who do not (McLellan & McKay, 1998). In a study that had over 10,000 participants (Simpson et al., 1997), the outcomes of three major SUD treatment modalities were examined: long-term residential (LTR) programs, outpatient drug-free (ODF)
programs, and outpatient methadone treatment (OMT) programs. In that study, the relationship of treatment duration with outcomes in each of the three major modalities was analyzed. Clients in both inpatient and outpatient settings (LTR and OMT) had significantly better outcomes than did those with shorter lengths of stay or shorter amounts of sessions attended, while the results for clients in ODF settings were inconclusive due to sample limitations (Simpson et al., 1997). These results supporting the duration of treatment as a predictor of favorable outcomes were recently confirmed in a study by Turner and Deane (2016) that examined predictors of reliable change in outcomes at various residential and non-residential drug treatment centers. Based on these results, we predicted that the results of our meta-analysis would favor treatments with longer durations (i.e., more sessions).

In summary, we predicted that RA to a particular therapeutic intervention would demonstrate greater between-group differences favoring that particular intervention. We predicted that the adjunct use of pharmacological interventions in both groups would be associated with smaller between-group differences, and the adjunct use of pharmacological interventions in one group would be associated with greater between-group differences following that particular intervention. In addition, we predicted that the number of intervention hours would be associated with greater between-group differences following the intervention that received more hours.

Method

Eligibility

This meta-analytic review of PDT, CBT, and drug counseling treatment for individuals with substance-use problems included data only from RCT studies. RCTs are often considered the gold standard in research methodology due to their ability to establish causality and control
for confounding variables. Specifically, the data from the studies that compared PDT to CBT or
drug counseling was included. For studies to be eligible, they had to be published no earlier than
1970 (see Keefe et al., 2014).

In our study, we used Warshaw’s (2022) definition of PDT as any psychotherapy
treatment that met one of the following criteria:

(a) the study author explicitly identified the treatment as psychoanalytic or
psychodynamic, unless the treatment was Interpersonal Therapy (IPT)—a specific
treatment method developed by Klerman, Weissman, and colleagues—in which case it
was excluded since IPT and PDT are not isomorphic (Markowitz & Weissman, 2008); (b)
the study used a treatment based on psychoanalytic or psychodynamic theory; or (c) the
treatment included all the following components (Keefe et al., 2014): the treatment
focused on transference or resistance in the therapeutic relationship; the conceptualization
of symptoms or problems emerged from intrapsychic conflict, developmental arrest,
difficulties with separation or individuation, object relations, or attachment; and the study
focused on the role of unconscious processes in the development or maintenance of
symptoms or problems We did not consider eclectic treatments that included
psychodynamic interventions as eligible for our study. (pp. 10–11)

To be eligible, all studies needed to include a comparison group, either CBT or drug
counseling. CBT treatment was defined for our study using the same principles as our
psychodynamic definition and as such needed to meet one of the following criteria: (a) the study
author explicitly identified the treatment as CBT or behavioral, or (b) the study used a treatment based on CBT theory.

A drug counseling treatment was defined for this study using similar principles as the PDT and CBT groups as such, which needed to meet one of the following criteria: (a) The study author explicitly identified the treatment as drug counseling, either with individuals or groups, or (b) the treatment was referred to in other terms, such as standard care or treatment as usual.

Eligible studies required participants to have been receiving treatment for a substance-use problem or to have received a formal substance-use diagnosis. While substance use did not must be the primary target in the study, the data were only extracted from a given study if it provided the necessary data for the subgroup of patients who were treated for substance-use problems. Studies that included populations wherein all the participants received both nicotine and substance-use treatment were considered eligible, although studies were not considered eligible if participants were given treatment for nicotine use alone.

All studies that met these criteria were included in our study, including those within and outside the US, those centered on adolescents and adults, those focused on comorbid populations, those exploring individual and group treatments, those investigating outpatient and inpatient treatments, and those conducted online and in person.

**Procedure**

The literature search, which included over 17,000 studies, consisted of both electronic and manual searches. The researchers attempted an electronic search of two major scholarly search engines, PsycINFO and Medline, and continued to search these databases at several different intervals during the span of their research. Additionally, the researchers conducted manual searches in six major academic journals for all issues published between 2014 and 2023.
Alcohol and Alcoholism, American Journal of Psychiatry, American Journal on Addiction, Archives of General Psychiatry/JAMA Psychiatry, Journal of the American Psychoanalytic Association, and Psychotherapy. These journals were selected based on that, at the time of the original electronic searches, they had the highest number of studies deemed eligible articles. When the literature search was updated, the list was retained to maintain consistency.

The present researcher was trained under the guidance of a meta-analysis expert to determine the studies’ eligibility. Included in this training was an overview of meta-analytic methods, uses, purposes, eligibility criteria for study inclusion, and a detailed review of study level and effect size level coding forms, as well as detailed instructions for extracting study and effect size level data.

The present researcher assessed the studies’ eligibility by examining the abstracts of the database search results and filtering the studies based on the eligibility criteria discussed above. For studies that appeared to be potentially eligible (as determined by the researchers), their full-text articles, book chapters, etc. were retrieved. Following the retrieval of the studies, the researchers further examined them based on the aforementioned psychodynamic eligibility criteria and finalized the inclusion of each study in the meta-analysis.

Additionally, the reference sections of all eligible studies were used to search for other potentially eligible studies that may have been missed in the previous searches. Once potentially eligible, the studies were retrieved in full text and reviewed to further determine their eligibility for inclusion in our study.

**Data Analysis**

The data (including means, effect sizes, and standard deviations) necessary to calculate post-treatment effect sizes between groups was extracted. We examined the standardized mean
difference score for independent groups—that is, the post-treatment and follow-up difference scores between groups.

There are no generally accepted standards for defining an equivalence margin (Miller & Manuel, 2008). Even a rather small effect may be clinically important if the treatment can be delivered to large populations at a relatively low cost (Miller & Manuel, 2008). Several proposals for choosing an equivalence margin in mental disorders have been made. Suggestions for the maximum difference in outcomes considered clinically irrelevant range from \( d = 0.24 \) to \( d = 0.60 \) (Steinert et al., 2017). Regarding categorically comparing treatments, the margin of difference for a clinically significant result in our current study is an effect size of 0.25.

For the analysis of our study’s categorical moderator, use of pharmacological interventions, we conducted a subgroup analysis using a \( Q \)-test, and we calculated associated \( p \)-values to determine whether the results were statistically significant (Lipsey & Wilson, 2001). For the continuous moderators, such as RA, we used meta-regression analyses to assess the relationship between the study effect sizes and the individual continuous predictor. We conducted three primary moderator analyses based on a priori hypotheses derived from previous research: (a) RA, (b) use of pharmacological interventions in addition to treatment, and (c) number of intervention hours.

Results

**Inclusion of Studies**

For our study, we updated the database initially compiled by the researcher’s in Warshaw (2022). For their initial comprehensive database search results analyzing studies from January 1970 to July 2020, PsycINFO identified 7,355 studies, and Medline identified 5,383 studies, to
be screened for eligibility. The numbers of studies the researchers found via citation searching
and other methods to be screened for eligibility were 79 and 36, respectively.

In our updated comprehensive database search results reviewing the period of July 2020–November 2022, PsycINFO identified an additional 1,146 studies, and Medline identified an additional 2,938 studies, to be screened for eligibility, bringing the combined totals to 9,258 studies identified by PsycINFO and 8,321 studies identified by Medline (Figure 1). Overall, researchers—including the present researchers—screened 17,694 studies per inclusion criteria. 17,242 studies were initially excluded, leaving 442 studies that were selected for full-text retrieval. For nine of the 442 selected studies, the full text could not be retrieved, and the studies were therefore excluded. Thus, we assessed 433 full-text studies for eligibility and included 16 studies, while excluding the remaining 417 studies per the study inclusion criteria in Appendix A. (The number of studies that were deemed ineligible and their justification for exclusion are provided in Figure 1.) Of the 16 studies included, 12 were independent samples.

**Quantitative Data Synthesis**

Effect sizes for between-group outcome differences were calculated for each of the 12 studies. Suggestions for the maximum difference in outcomes considered clinically irrelevant ranged from $d = 0.24$ to $d = 0.60$ (Steinert et al., 2017). Regarding categorically comparing treatments, the margin of difference for a clinically significant result in our current study was an effect size of 0.25.

The results indicated no demonstrable differences in outcome measures between participants randomized to the PDT or control groups ($d = .088$, 95% CI $[-.057,.234]$, $Z = 1.194$, $p = .232$; Table 1).
The heterogeneity test results for the overall meta-analysis were not statistically significant ($Q = 5.97 \ p = .876$), with no demonstratable true between studies heterogeneity ($I^2 = .00$). This indicates that there was less variability across effect sizes than would have occurred by chance and suggests that other moderator variables that may account for the degree of heterogeneity are unlikely.

The results assessing for publication bias using Begg and Mazumdar’s (1994) rank correlation method showed no indication of publication bias for the overall meta-analysis (Kendall’s tau [with continuity correction,] = .076 $p$[one-tailed] = 0.365 or Egger’s (Egger et al., 1997) regression intercept method (intercept = .098 $p$[one-tailed] = .437). Moreover, results from Duval and Tweedie’s (2000a; 2000b) trim and fill procedure suggested that any impact of potential publication bias was likely minimal (zero studies were trimmed, and the adjusted and observed estimates of effect size were identical).

Moderator analyses were done using a mixed-effects regression for the amount of treatment and RA measures, and a $Q$-between test was used for using pharmacological interventions. None of the moderator analyses revealed statistical significance, including the amount of treatment in the PDT groups (intercept = .172 $p = .215$; see Table 2) and NonPDT groups (intercept = .174 $p = .216$; see Table 3), as well as RA for direct variables in the PDT (intercept = .059 $p = .770$; see Table 4) and NonPDT groups (intercept = .051 $p = .629$; see Table 5), the indirect variables for the PDT (intercept = .063 $p = .831$; see Table 6) and NonPDT groups (intercept = .099, $p = .538$; see Table 7), and overall (intercept = .827 $p = .482$; see Table 8) and use of pharmacological interventions in the PDT groups ($Q = .093 \ p = .955$) and the NonPDT groups ($Q = .093 \ p = .955$).
**Discussion**

The outcomes of this meta-analysis revealed no substantial variability in treatment efficacy, thereby substantiating the central hypothesis positing PDT’s equivalence to CBT and IDC in addressing substance-use disorders ($d = 0.088$). The analysis of moderators failed to attain statistical significance regarding adjunct pharmacological treatment, RA, or treatment duration, in contrast to prior research expectations (Munder et al., 2011; Ray et al., 2020; Turner & Deane, 2016). The small overall sample size of the number of studies in the meta-analysis may have accounted for the lack of significant findings within the moderator analysis, as discussed in the subsequent limitations section.

Heterogeneity tests yielded non-significant results, suggesting less diversity across effect sizes than expected by chance, thus discounting the likelihood of other moderator variables influencing heterogeneity. Likewise, publication bias analyses did not exhibit statistical significance, indicating limited influence—if any—of publication bias on the meta-analytic results.

Several limitations warrant consideration in this study. Notably, one included study lacked comprehensive data for coding, resulting in conservative coding of effect sizes of $d = 0.000$. This conservative coding may lead to results that underestimate the true effect sizes. Moreover, the small sample size of 12 underscores broader gaps in empirical evidence concerning psychodynamic therapy, particularly within substance-use disorders. Additional studies are imperative to bolster sample sizes and enhance result accuracy.

Another limitation to the present study is that there was only one rater who coded all the eligible studies, i.e., the present researcher. While questions about coding were discussed with a senior meta-analyst before the analyses were conducted, the addition of another trained rater may
have contributed to greater accuracy of the coded data, potentially influencing the overall results of this meta-analysis.

Our results align with the current and past literature for meta-analysis reviewing SUD treatment, including Imel et al. (2008) and Warshaw (2022). Our findings of equivalency among treatments align as well with Rosenzweig’s (1936) often cited “dodo-bird effect.” Wampold and Imel (2015) discuss the “dodo-bird effect” at length in their book *The Great Psychotherapy Debate* and cite similar results to ours, that there is an equivalency between treatment effectiveness across the field of mental-health treatments, including the treatment of depression, post-traumatic stress disorder and AUDs. The authors argue that the observed benefits of psychotherapy likely stem from factors common across different approaches. These factors include the therapeutic alliance, client expectations, and therapist characteristics as potential explanations for positive outcomes rather than the specific techniques employed within a particular therapeutic school of thought (Wampold & Imel, 2015). Future research should further explore these factors and provide evidence for particular commonalities between treatments.

The non-significant moderator results are noteworthy as they were not as hypothesized and in contrast to prior research expectations (Munder et al., 2011; Ray et al., 2020; Turner & Deane, 2016). These results must be analyzed in the light of our studies small overall sample size mentioned earlier, as the small number of studies in the meta-analysis may have accounted for the lack of significant findings within the moderator analysis. It is expected that with a greater sample size these moderators may have revealed significant results, however if these results would remain consistent with our findings it would raise significant research questions. This highlights a need for further research for each moderator we studied. For example, currently there is significant evidence supporting pharmacological interventions in conjunction with
psychological treatment for the treatment of SUDs (Irvin et al., 1999; Magill & Ray, 2009; Ray et al., 2020). At the same time, if our studies results remained consistent with a larger sample size, that could bring the use of adjunct pharmacological treatment for SUDs into question, which would have large impacts on treatment, specifically considering the costs of these medications and their potentially harmful side effects. Similarly, our non-significant findings for amount of intervention would contradict with current evidence (Turner & Deane, 2016), but potentially suggest that more treatment is not necessarily more effective. These results are more likely to be explained by our small sample size and highlighting areas of potential future study and the need for continued research in this field.

It is noteworthy that only 16 studies and 12 independent samples were deemed eligible for our study. This relatively small sample size highlights the need for further research in the field of PDT for SUDs. Zilcha-Mano et al. (2018) suggested several reasons why there is relatively little empirical research on PDT for SUDs, primary being the dominance of other therapeutic modalities, such as CBT. Additionally, the complex nature of PDT can make it challenging to measure and evaluate using traditional empirical methods. Furthermore, there may be limited funding and resources allocated to researching PDT for SUDs compared to other treatment approaches. Wampold and Imel (2015) suggest that the dearth of research could also be explained by a complex and controversial history of SUD treatment, along with outdated methodological procedures in the studies that were completed.

Another explanation for the lack of research for PDT for SUDs is the viewpoint from the psychodynamic tradition that substance abusers are unsuited for PDT due to a lack of motivation, immaturity, acting out, poor treatment retention, lacking impulse control, antisocial behavior, and high relapse rates. Bean (1984) argues that psychotherapy with alcoholics cannot begin until
several years of abstinence are achieved, and that psychotherapy for substance abusers is a luxury. The results of our study add to the growing support PDT as a viable treatment for SUDs, providing evidence that can hopefully help dispel the long-held myth that substance abusers are unsuitable for PDT.

While our study did show supporting evidence for PDT, the outcomes were not significantly better than drug counseling. These results are in line with expectations from past studies (Crits-Christoph et al., 2008; Halladay, 1992; Luborsky, 1995; Philips et al., 2018; Ojehagen et al., 1991; Olson et al., 1981) and support the “dodo bird” hypothesis (Rosenzweig, 1936). The results are interesting given that drug counseling does not require nearly the same amount of training for its clinicians compared to CBT and PDT and does not focus on internal psychological processes (Woody et al., 1983). Various explanations have been given to try to explain drug counseling’s comparative success compared to more professional psychotherapy approaches such as CBT and PDT. Halliday (1992) suggests that pre-treatment characteristics and other external factors play a larger role than psychotherapy approaches. Kazdin (1986) theorizes that, in general, types of psychotherapy treatments should not be expected to differ in effectiveness since all psychotherapies help in the same vital factors: hope, rationale, and a supportive relationship. These findings are also in line with Crits-Christoph et al. (1999), who suggested drug counseling was the treatment of choice among those they studied given the ease of cost, time, and training for IDC compared to CBT and PDT (Crits-Christoph et al., 1999).

It is important to consider cultural considerations when generalizing the results of our study. While our study provided evidence for the efficacy of PDT for SUD, significant barriers to treatment remain, including stigma, and financial barriers. Despite a recent successful class action lawsuit to have an insurance company cover psychodynamic treatment it remains limited
in its support and accessibility (Lazar, 2021) As well, ethnic minorities with SUDs, may be particularly at risk for poor treatment outcomes, as found in a recent study by Saloner and Lê Cook (2013), who found that blacks, Hispanics and native Americans were significantly less likely than their white counterparts to complete SUD treatment. They found the differences in treatment completion were largely explained by differences in socioeconomic status and greater unemployment and housing instability (Saloner & Lê Cook, 2013). Stereotyping may also influence substance-use and treatment outcomes by increasing the risk of stereotype-threat situations, in which minority members find themselves at risk for fulfilling a commonly held group-based stereotype (Steele & Aronson, 1995). Additionally, there has been a lack of specialized programs for sexual minorities (Senreich, 2010) who are also at a higher risk of abusing substances with 6.7% of sexual minority adults in 2020 misused opioids in the past year, compared to 3.6% of the overall adult population, approximately 21.8% of sexual minority adults had an alcohol use disorder in the past year, compared to 11.0% in the overall population (SAMHSA, 2022). Future research should explore the efficacy of PDT for SUDs with these specific populations, and how it can be made accessible for them and catered to better fit their needs.

Future research should also explore the use of different modalities for the provision of PDT for SUDs including the use of video calls and other technologies (Meshberg-Cohen et al., 2023). As well, future research should explore the adjunct use of novel treatment approaches such as the use of psychedelics in conjunction with PDT for SUDs (Grabski et al., 2022; van der Meer et al., 2023). As well, many of our studies utilized abstinent based approaches, while more novel treatments have utilized a harm-reduction approach that has been supported by evidence
Future research may look to compare abstinent based PDT to harm-reduction based PDT approaches such as harm reduction psychotherapy (Tatarsky, 2003).

**Conclusion**

The results of our meta-analysis add to the growing evidence base for PDT—specifically, as an equivalent treatment to CBT and IDC for SUDs. Our results align with the current and historical literature for meta-analysis reviewing SUD treatment, including Imel et al. (2008) and Warshaw (2022). Our findings of equivalency among treatments align as well with Rosenzweig’s (1936) often cited “dodo-bird effect.” As emphasized earlier, the need for effective SUD treatments is a pressing one, with a toll of 100,306 lives lost to SUDs in 2021 alone (Center for Disease Control, 2021). It is this author’s hope that this study can provide supporting evidence for effective treatments for a population desperately in need, and perhaps inspire future research into a field that has been so lacking it (Zilcha-Mano et al., 2018).
References

* Indicates references included in the meta-analysis


testing and adjusting for publication bias in meta-analysis. *Biometrics, 56*(2), 455-463.

https://doi.org/10.1111/j.0006-341X.2000.00455.x


https://doi.org/10.1136/bmj.315.7109.629


Saloner B, Lê Cook B. Blacks and Hispanics are less likely than whites to complete addiction treatment, largely due to socioeconomic factors. *Health Affairs, 32*(1)135-145. doi: 10.1377/hlthaff.2011.0983.


Substance Abuse and Mental Health Services Administration. (2022, July 27). 2020 National Survey on Drug Use and Health: Lesbian, Gay, and Bisexual (LGB) Adults [Slides].


Appendix A: Eligibility Criteria for PDT for Substance-Use RCT MA

1. **Study design:** eligible studies must use random assignment of participants.

2. **Age:** No limitations for age were applied for the present meta-analysis, i.e., the study can include participants of any age.

3. **Problem/Diagnosis:** The participants had to be receiving treatment for a substance use problem/diagnosis. The substance use does not must be the primary problem/diagnosis, but the only eligible data are for those participants who **all** have a substance use problem/diagnosis. That is, an eligible study **can** include a study in which
   - participants have a primary diagnosis, for example, of Borderline PD but who **all** have substance use problems/diagnosis
   - participants do **not** all have a substance use problem/diagnosis, but the study provides separate subgroup data for participants who **all** have substance use problems/diagnosis

4. **Nicotine use:** Studies that provide treatment for individuals who have problems with **only** nicotine use are **not** eligible. If, however, a study includes individuals who **all** have **other** relevant substance use problem(s)—as well as problems with nicotine use—then that study **would** be considered eligible.

5. **Treatment:** studies had to provide treatment(s).

6. **Definition of PDT:** To be considered PDT, the intervention must meet **one** of the following criteria:
   
   a. The study authors explicitly identify the treatment as psychoanalytic/psychodynamic, unless the treatment is IPT—a specific treatment method developed by Klerman, Weissman, and colleagues—in which case it would be excluded based on criterion #8 below.
b. The study indicates that it used a treatment based on a psychoanalytic/psychodynamic theory

c. The treatment included **all** the following components (Keefe et al., 2014):
   
   i. focus on transference or resistance in the therapeutic relationship
   
   ii. conceptualization of symptoms/problems as emerging from either intrapsychic conflict, developmental arrest, difficulties with separation/individuation, object relations, or attachment
   
   iii. focus on the role of unconscious processes in the development or maintenance of symptoms/problems

d. Examples (this list is **not** exhaustive) of psychoanalytic/psychodynamic treatments include:
   
   i. Supportive-Expressive psychotherapy
   
   ii. Time-limited dynamic psychotherapy (TLDP)
   
   iii. Mentalization therapy/treatment
   
   iv. Transference-Focused Psychotherapy
   
   v. Relational psychotherapy (this should be verified eventually by checking the full text because it may or may not be a psychoanalytic/psychodynamic treatment)
   
   vi. Dynamic Deconstructive Psychotherapy (DDP)
   
   vii. Interpersonal Reconstructive Therapy (IRT)
   
   viii. Reconstructive Learning therapy (this should be verified eventually by checking the full text because it may or may not be a psychoanalytic/psychodynamic treatment)
ix. Insight-oriented therapy (this should be verified eventually by checking the full text because it may or may not be a psychoanalytic/psychodynamic treatment)

x. Time-Limited Psychotherapy (TLP; this should be verified eventually by checking the full text because it may or may not be a psychoanalytic/psychodynamic treatment)

xi. Brief Relational Therapy (BRT)

xii. Object relations therapy

xiii. Self-psychology therapy

xiv. Short-term anxiety-provoking psychotherapy

xv. Intensive short-term dynamic psychotherapy

xvi. Accelerated experiential dynamic psychotherapy (this should be verified eventually by checking the full text because it may or may not be a psychoanalytic/psychodynamic treatment)

xvii. Brief Adaptive therapy (this should be verified eventually by checking the full text because it may or may not be a psychoanalytic/psychodynamic treatment)

7. **Further Specification of PDT Definition:** Theoretically integrative or eclectic treatments that included using PDT techniques in the intervention group were not considered eligible.

8. **Interpersonal Therapy (IPT):** IPT—a specific treatment method developed by Klerman, Weissman, and colleagues—in and of itself is not considered an eligible PDT intervention.

9. **Individual/Group Format:** PDT intervention groups could be either individual or group modalities.
10. **Short-term or long-term:** The PDT intervention group could be either short-term or long-term treatment.

11. **Manual:** The PDT intervention group could either use a manual or not use a manual.

12. **Art therapy, drama therapy, or music therapy:** If the only psychodynamically-oriented treatment in the study is art therapy, drama therapy, or music therapy, the study is **not** eligible.

13. **Use of Adjunctive Treatments in the Intervention Group:** Studies in which participants in the intervention group received treatment that met criteria for PDT (as per above) and received adjunctive treatment (e.g., milieu therapy, art therapy) were considered eligible.

14. **Use of Medication:** Studies in which participants took psychiatric medications in addition to receiving PDT were considered eligible.

15. **Sample Size:** Studies had to include a sample size greater than 1.

16. **Effect Size Data:** To be eligible, the study had to provide sufficient data to permit the calculation of the effect size(s) or this information needed to be provided by the author(s) of the study. *If the study is otherwise eligible and indicates only that there were no significant findings in terms of between-group differences, it would still be eligible.*

17. **Date of study:** Based on Keefe et al. (2014) and Leichsenring and Klein (2014), only studies from 1970 on were considered eligible.

18. **Review articles:** Review articles were not included in the meta-analysis (although they may be used to obtain additional references).

19. **Outcome data:** Eligible studies must provide outcome data. If the only data provided by the study is dropout rates/attrition but no actual outcome data, the study is not eligible.
20. **Case studies:** Studies that consisted of single case study or multiple case studies were excluded.
Appendix B: Database Search Terms

Database search terms included the following: (psychodynamic* OR psycho-dynamic* OR dynamic* OR psychoanalytic* OR analytic* OR insight* OR interpret* OR (object W0 relation*) OR transference* OR supportive-expressive OR (supportive W0 expressive) OR mentalization OR relational OR (interpersonal W0 reconstructive) OR (short* W0 anxiety-provoking) OR (short-term W0 anxiety-provoking) OR (short* W0 anxiety W0 provoking) OR (time* W0 limited) OR (brief W0 adaptive) OR (reconstructive W0 learning) OR (self W0 psycholog*) OR (self-psycholog*) AND (therap* OR psychotherap* OR treatment* OR counseling OR counselling) AND (addict* OR substance* OR drug* OR alcohol* OR cocaine* OR opiate* OR opioid* OR marijuana* OR cannabis* OR ecstasy* OR LSD* OR amphetamine* OR methamphetamine* OR heroin* OR prescript* OR stimulant* OR hallucinogen* OR inhalant* OR barbiturate* OR phencyclidine* OR PCP* OR sedative* OR anxiolytic* OR hypnotic*) AND (study OR studies OR trial*).
Appendix C: Study Coding Form

1. Type of publication: [PUBTYPE]
   - (a) Book
   - (b) Book chapter
   - (c) Journal article
   - (d) Master’s thesis
   - (e) Doctoral dissertation

2. Publication year [Code “Unknown” if unknown; PUBYEAR]

3. Mean Age [MEANAGE; code “Cannot tell” if cannot tell]

4. Percentage white [RACE; code to two decimal places, e.g., code “50.24” if percentage white is 50.24%]

5. Percentage female [GENDER; code to two decimal places, e.g., code “50.24” if percentage female is 50.24%]

6. Were patients given a formal diagnosis (note: formal diagnosis can be done using, for example, ICD or DSM; note: if patients are just having substance use “problems,” for example, then code “0” for “No” [Dx])?
   - (0) No
   - (1) Yes

7. Primary substance being treated [PrimSub]
   - (a) Alcohol
   - (b) Cannabis
   - (c) Opiate
• (d) Mixed substances (that is, patients had substance use problem[s]/diagnosis, but no specific primary substance was required for receiving treatment)
• (e) Other: __________________ (code “e” and write in next to it the substance)

8. Did the study have an adjunctive treatment in the PDT group [AdjPDT]?  
   • 0 (No)  
   • 1 (Yes)

9. What was the adjunctive treatment given to the PDT group?  
   _____________________ (write in; if not applicable, code “N/A”) [AjdPDTname]

10. Did the study have an adjunctive treatment in the non-PDT group [AdjNonPDT]?  
    • 0 (No)  
    • 1 (Yes)

11. What was the adjunctive treatment given to the non-PDT group?  
    _____________________ (write in; if not applicable, code “N/A”) [AjdNonPDTname]

12. Amount of intervention (number of hours) for the PDT group: (Note: Code only the amount of PDT intervention—if there was adjunctive treatment[s] provided to the PDT group, do not code the amount of the adjunctive treatment[s]; DOSAGE_PD)

13. Type of comparison group: [CGTYPE]  
   • (a) No Treatment Control Group  
   • (b) Waiting list  
   • (c) CT/BT/CBT  
   • (d) Non-specific “supportive therapy”  
   • (e) Drug counseling  
   • (f) Medication
14. Amount of intervention (number of hours) for control group: (Note: Code only the amount of control group intervention; if there was adjunctive treatment[s] provided to the control group, do not code the amount of the adjunctive treatment[s];

DOSAGE_CONTROL]

15. Percentage attrition for PDT participants at posttest (i.e., take the number of participants who completed PDT, divide by the number of participants who started PDT, and then multiply by 100, and code to 2 decimal places). Then subtract that number from 100. [ATTRIT_PD; If cannot tell, code “Cannot Tell”]

16. Percentage attrition for control group participants at posttest (i.e., take the number of participants who completed the control group, divide by the number of participants who started the control group, and then multiply by 100, and code to 2 decimal places). Then subtract that number from 100. [ATTRIT_Control; If cannot tell, code “Cannot Tell”]

17. Number of conditions/groups beyond the PDT group (e.g., if a study had two intervention conditions, one being PDT and one being Motivational Interviewing, both of which were compared to a no-treatment control group, you would code “2”) 

[#_INTRVN]

Researcher Allegiance

18. Rate the degree of researcher allegiance to PDT by assessing study design issues, such as if the author(s) developed or advocated one of the treatments, supervised or
trained the therapists for one particular treatment in the study, or if more experienced therapists were used for one of the treatments. Use a five-point scale, where 0 represents no researcher allegiance and 4 represents evidence of strong researcher allegiance

[ALLEG_PDT]

• 0 (no researcher allegiance)
• 1
• 2
• 3
• 4 (strong researcher allegiance)

19. Rate the degree of researcher allegiance to the non-PDT by assessing study design issues, such as if the author(s) developed or advocated one of the treatments, supervised or trained the therapists for one particular treatment in the study, or if more experienced therapists were used for one of the treatments. Use a five-point scale, where 0 represents no researcher allegiance and 4 represents evidence of strong researcher allegiance [ALLEG_NonPDT]

• 0 (no researcher allegiance)
• 1
• 2
• 3
• 4 (strong researcher allegiance)

20. Who developed the PDT treatment? [Code this variable based on the information specifically presented in the Background and Method sections of the study; MUNDER1]

• 0 (No)
21. The author advocates for the PDT treatment. [Code this variable based on the information specifically presented in the Background and Method sections of the study; MUNDER2]
   - 0 (No)
   - 1 (Yes)

22. The author contributed to an etiological model that is consistent with the PDT treatment. [Code this variable based on the information specifically presented in the Background and Method sections of the study; MUNDER3]
   - 0 (No)
   - 1 (Yes)

23. Has the author published supporting evidence for the PDT treatment? [Code this variable based on the information specifically presented in the Background and Method sections of the study; MUNDER4]
   - 0 (No)
   - 1 (Yes)

24. A review of previous evidence favors the PDT treatment. [Code this variable based on the information specifically presented in the Background and Method sections of the study; MUNDER5]
   - 0 (No)
   - 1 (Yes)
25. Hypothesis in favor of the PDT treatment? [Code this variable based on the information specifically presented in the Background and Method sections of the study; MUNDER6]
   - 0 (No)
   - 1 (Yes)

26. Is the treatment description of PDT included in the article? [Code this variable based on the information specifically presented in the Background and Method sections of the study; MUNDER7]
   - 0 (No)
   - 1 (Yes)

27. Who developed the non-PDT treatment? [Code this variable based on the information specifically presented in the Background and Method sections of the study; MUNDER8]
   - 0 (No)
   - 1 (Yes)

28. The author advocates the non-PDT treatment. [Code this variable based on the information specifically presented in the Background and Method sections of the study; MUNDER9]
   - 0 (No)
   - 1 (Yes)
29. The author contributed to an etiological model that is consistent with the non-PDT treatment. [Code this variable based on the information specifically presented in the Background and Method sections of the study; MUNDER10]
   - 0 (No)
   - 1 (Yes)

30. Has the author published supporting evidence for the non-PDT treatment? [Code this variable based on the information specifically presented in the Background and Method sections of the study; MUNDER11]
   - 0 (No)
   - 1 (Yes)

31. A review of previous evidence favors the non-PDT treatment. [Code this variable based on the information specifically presented in the Background and Method sections of the study; MUNDER12]
   - 0 (No)
   - 1 (Yes)

32. Hypothesis in favor of the non-PDT treatment? [Code this variable based on the information specifically presented in the Background and Method sections of the study; MUNDER13]
   - 0 (No)
   - 1 (Yes)

33. Is the treatment description for non-PDT included in the article? [Code this variable based on the information specifically presented in the Background and Method sections of the study; MUNDER14]
• 0 (No)
• 1 (Yes)

34. Sum of the **direct** researcher allegiance items for **PDT** [Sum Direct PDT; **Note:** An Excel formula with calculate this value]

35. Sum of the **direct** researcher allegiance items for the **non-PDT** treatment [Sum Direct non-PDT; **Note:** An Excel formula with calculate this value]

36. Sum of the **indirect** researcher allegiance items for **PDT** [Sum Indirect PDT; **Note:** An Excel formula with calculate this value]

37. Sum **indirect** researcher allegiance for the **non-PDT** treatment [Sum Indirect non-PDT; **Note:** An Excel formula with calculate this value]

38. Overall score for Munder scale [MUNDER_Overall]
   • 0 (if there was no difference in the direct and indirect indicators)
   • 1 (if the treatments were equal in terms of the direct indicators and differed by one point in terms of the sum of the indirect indicators)
   • 2 (if the treatments were equal regarding the direct indicators and differed by two points or more in terms of the sum of the indirect indicators)
   • 3 (if the treatments differed by one point in terms of the sum of the direct indicators)
   • 4 (if the treatments differed by two points or more in terms of the sum of the direct indicators)

39. Overall Munder scale score indicates researcher allegiance for which treatment [MUNDER_Tx]?
   • (a) PDT
• (b) Non-PDT
Appendix D: Effect Size Coding Form

1. Effect Size Type [ESTYPE]
   a. Group comparison between PDT and comparison group at posttest
   b. Group comparison between PDT and comparison group at follow-up

2. Interval in months between completion of intervention and follow-up (if applicable to the particular effect size being coded on this particular coding form) [FaInt] [Code “N/A” if not applicable; if applicable but cannot tell from the study, use “Cannot Tell”]

3. % Attrition at follow-up (N.B.: calculate attrition rate relative to posttest; Code “N/A” if not applicable; Code “Cannot Tell” if cannot tell) [FuAttrit]

4. Outcome Measure: Note the full name and version of the measurement tool that the study data reported in this row was collected using (e.g., Beck Depression Inventory II) [OutcomeMeasureName]:__________

5. Type of Outcome [TypeOfOutcome]

Note regarding full scale vs. subscale data: If a study reports both total score data (i.e., GSI on the BSI) as well as subscale data (e.g., Anxiety subscale of BSI and Depression subscale of BSI), only code the total score data.

a. Substance use
b. Depression
c. Anxiety
d. General psychiatric symptoms (e.g., the GSI from the Brief Symptom Inventory)
e. Somatic symptoms
f. Interpersonal problems
g. Social functioning
h. Personality functioning/traits (e.g., a measure of reflective functioning or measures of disturbance in personality functioning, such as MCMI-III Borderline personality pathology scale or Personality Disorder Belief Questionnaire)
i. Other psychiatric complaints and common symptoms (e.g., other Axis I symptom measures [e.g., EAT-26], behavioral measures [e.g., attempts at self-harm], or measures of common symptoms [e.g., impulsivity and aggression measures]).

j. Other (write in): _______________________

6. Type of data effect size based on [DataFormat]
   a. Means, standard deviations, and sample sizes
   b. Frequencies or proportions, dichotomous
   c. Frequencies or proportions, polychotomous
   d. Pearson’s product-moment correlation
   e. Spearman rank-order correlation
   f. Point-biserial correlation
   g. Phi correlation
   h. Chi Square (with $df = 1$)
   i. $t$-value testing the statistical significance of $r$
   j. Cohen’s $d$, also known as standardized mean difference score
   k. Exact two-tailed $p$ value (when all the above are unavailable)
   l. Other (Code “L” and then write in specific data format; e.g., “L; multi-group contrast analysis”): _______________________

7. Type of control/comparison group [CgTypeES]
   a. Active comparison group
   b. Waiting list
   c. Treatment as usual
   d. Other (write in): __________
   e. N/A (no control comparison group)

8. Type of Outcome [TYPE of OUTCOME]
1. Substance use symptoms or substance use diagnosis (i.e., presence/absence of substance use diagnosis)

2. Urine toxicology result

3. Substance use frequency or severity

4. Depression symptoms or depression diagnosis (i.e., presence/absence of depression)

5. Anxiety symptoms or anxiety diagnosis (i.e., presence/absence of anxiety diagnosis)

6. Overall psychopathology

7. Dosage of medication-assisted treatment

8. Legal problems

9. Work-related problems

10. Physical health (e.g., # of doctor visits in the last month, blood pressure, etc.)

11. Overall wellbeing/quality of life

12. Other (write in): _______________________

9. Primary/Target symptoms versus secondary outcomes [PRIMARY/TARGET]

   a. Primary/Target symptoms

      i. Code if the study author specifically indicates that the outcome measure is the primary/target symptom

      ii. If unclear, code “primary” if the data is for the primary substance being studied (for example, if it’s a study of opiate use and the authors provide data on opiate and cocaine use, code the opiate use data as the primary/target outcome).
iii. If there is more than one type of data for the primary substance being studied, code the outcome as continuous rather than categorical.

b. Secondary
   i. Code as per guidelines above

10. Type of substance for outcome variable (N.B.: only code this if the type of outcome is substance-related outcome data; otherwise, code N/A [SbstncOutcm])
   a. Alcohol
   b. Cannabis
   c. Hallucinogen (e.g., phencyclidine)
   d. Inhalant
   e. Opioid
   f. Sedative/Hypnotic/Anxiolytic
   g. Stimulant
   h. Tobacco
   i. Other (write in): ________________
   j. N/A (code if the type of outcome you are coding is not a substance-related one)

11. Source of information for outcome measures [SOURCE]
   a) Self-report
   b) Clinician (e.g., diagnosis)
   c) Non-clinician informant (e.g., report of spouse)
      d) Medication-assisted treatment dosage or urinalysis results
      e) Other (write in): ________________

12. Used WebPlotDigitizer to extract effect size data from graphs or figures [WebPltDgtzr]?  
    (0) No
    (1) Yes
Note: This section is used for when you are coding Ms., SDs, and N sizes. If you are coding different data, code all these variables as “N/A.”

13. Mean for PDT group at posttest [MeanPDTpost; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

14. Standard deviation for PDT group at posttest [SdPDTpost; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

15. N size for PDT group at posttest [nPDTpost; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

16. Mean for comparison group at posttest [MeanComparisonPost; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

17. Standard deviation for comparison group at posttest [SdComparisonPost; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

18. N size for comparison group at posttest [nComparisonPost; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

19. Mean for PDT group at follow-up [MeanPDTf/u; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

20. Standard deviation for PDT group at follow-up [SdPDTf/u; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

21. N size for PDT group at follow-up [nPDTf/u; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

22. Mean for comparison group at follow-up [MeanComparisonF/U; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

23. Standard deviation for comparison group at follow-up [SdComparisonF/U; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]
24. **N size** for comparison group at follow-up [nComparisonF/U; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

**Note:** This section is used for when you are coding outcome data that is dichotomous. If you are coding different data, code all these variables as “N/A.”

25. Number of events for PDT group for pretest plus number of events for PDT group for posttest [nEventsPre-Post; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

26. Number of events for PDT group for pretest [nEventsPre; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

27. Number of events for PDT group for posttest [nEventsPost; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

28. Number of non-events for PDT group for pretest plus number of non-events for PDT group for posttest [nNonEventsPre-Post; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

29. Number of events for PDT group for pretest plus number of events for PDT group for follow-up [nEventsPre-F/U; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

30. Number of events for PDT group for pretest [nEventsPre; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

31. Number of events for PDT group for follow-up [nEventsF/U; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

32. Number of non-events for PDT group for pretest plus number of non-events for PDT group for follow-up [nNonEventsPre-F/U; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]
Note: This section is used for when you are coding outcome data from a dependent t-statistic. If you are coding different data, code all these variables as “N/A.”

33. **Mean** for PDT group at **pretest** when using dependent t-test data [MeanPDTpre_dndntT; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

34. **Mean** for PDT group at **posttest** when using dependent t-test data [MeanPDTpost_dndntT; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

35. **Mean** for PDT group at **follow-up** when using dependent t-test data [MeanPDTf/u_dndntT; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

36. **Dependent t-statistic** [DndntT; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

________________________________________________________________________________

Note: This section is used for when you are coding outcome data from an exact p-value for dependent data. If you are coding different data, code all these variables as “N/A.”

37. **p-value** (two-tailed) for the statistical test at **posttest** [pValue_dndntData_post; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

38. **Degrees of freedom** for the statistical test at **posttest** [df_dndntData_post; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

39. Pre-Post Correlation on **Outcome Measure** for PDT group [rPrePst_PDT; input the correlation between the outcome data at pretest and at posttest; if this is not reported in the study, impute a correlation of .70; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

40. **d_equivalent** for dependent data for **posttest** [d_equiv_dndnt_post; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]
41. \textit{p-value} (two-tailed) for the statistical test at follow-up [pValue\_dpndntData\_f/u; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

42. Degrees of freedom for the statistical test at follow-up [df\_dpndntData\_f/u; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

43. Pre-Follow/Up Correlation on Outcome Measure for PDT group [rPreF/U\_PDT; input the correlation between the outcome data at pretest and at follow-up; if this is not reported in the study, impute a correlation of .70]

44. \textit{d\_equivalent} for dependent data for follow-up [d\_equiv\_dpndnt\_f/u; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

\begin{verbatim}
Note: This section is used for when you are coding Ms., N size, paired groups \textit{p-value}, and number of tails. If you are coding different data, code all these variables as “N/A.”

45. Mean for PDT group at pretest [MeanPDTpre; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

46. Mean for PDT group at posttest [MeanPDTpost; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

47. Sample size for PDT group [N\_PDT; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

48. \textit{p-value} for paired group comparison for PDT group [p\_PDTPaired; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]

49. Number of tails in the paired group comparison for PDT group [tails\_PDTPaired; if not applicable (e.g., the only data reported is an independent t-test), code “N/A”]
\end{verbatim}

50. Page number where effect size data found [PAGENUM]
51. Sign of the effect size at posttest (assign a “1” if the PDT group demonstrated better outcome, or a −1” if the PDT group demonstrated worse outcome; Code N/A if coding follow-up) [SIGN_POST]

52. Sign of the effect size at follow-up (assign a “1” if the PDT group demonstrated better outcome, or a −1” if the PDT group demonstrated worse outcome; Code N/A if coding follow-up)

53. [SIGN_FU]
**Table 1**

*Overall The results Comparing Post-Treatment and Follow-Up Effect Sizes of PDT and Comparison Group (CBT or IDC)*

<table>
<thead>
<tr>
<th>Study</th>
<th>Standardized Difference in Means</th>
<th>SE</th>
<th>Variance</th>
<th>LL</th>
<th>UL</th>
<th>Z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crits-Christoph et al., 2001; Crits-Christoph et al., 1999</td>
<td>0.078</td>
<td>0.135</td>
<td>0.0018</td>
<td>−0.186</td>
<td>0.342</td>
<td>0.581</td>
<td>.561</td>
</tr>
<tr>
<td>Gregory et al., 2008; Gregory et al., 2010</td>
<td>0.43</td>
<td>0.509</td>
<td>0.26</td>
<td>−0.568</td>
<td>1.429</td>
<td>.845</td>
<td>.398</td>
</tr>
<tr>
<td>Halliday, 1992</td>
<td>0.081</td>
<td>0.252</td>
<td>0.064</td>
<td>−0.414</td>
<td>0.576</td>
<td>0.32</td>
<td>.749</td>
</tr>
<tr>
<td>Hellerstein et al., 1995</td>
<td>−0.404</td>
<td>0.299</td>
<td>0.089</td>
<td>−0.99</td>
<td>.181</td>
<td>−1.353</td>
<td>.176</td>
</tr>
<tr>
<td>Ojehagen, 1992</td>
<td>0.425</td>
<td>0.502</td>
<td>0.252</td>
<td>−0.558</td>
<td>1.408</td>
<td>0.847</td>
<td>.397</td>
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<tr>
<td>Philips, 2018</td>
<td>−0.279</td>
<td>0.471</td>
<td>0.222</td>
<td>−1.203</td>
<td>0.644</td>
<td>−0.592</td>
<td>.554</td>
</tr>
<tr>
<td>Sandahl et al., 1998; Sandahl et al., 2004</td>
<td>0.184</td>
<td>0.354</td>
<td>0.125</td>
<td>−0.509</td>
<td>0.877</td>
<td>0.52</td>
<td>.603</td>
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<tr>
<td>Shaffer et al., 1997</td>
<td>0.000</td>
<td>0.26</td>
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<td>0.51</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Suchman et al., 2010; Suchman et al., 2011</td>
<td>0.285</td>
<td>0.313</td>
<td>0.098</td>
<td>−0.328</td>
<td>0.898</td>
<td>0.911</td>
<td>.362</td>
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<tr>
<td>Suchman et al., 2017</td>
<td>0.319</td>
<td>0.22</td>
<td>0.048</td>
<td>−0.111</td>
<td>0.75</td>
<td>1.454</td>
<td>.146</td>
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<tr>
<td>Woody et al., 1990</td>
<td>0.039</td>
<td>0.249</td>
<td>0.062</td>
<td>−0.449</td>
<td>0.528</td>
<td>0.158</td>
<td>.874</td>
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<td></td>
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<td>---</td>
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<td></td>
</tr>
<tr>
<td>Woody et al., 1995</td>
<td>0.074</td>
<td>0.235</td>
<td>0.055</td>
<td>-0.387</td>
<td>0.536</td>
<td>0.317</td>
<td>0.752</td>
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<tr>
<td>Average weighted d</td>
<td>0.088</td>
<td>0.074</td>
<td>0.005</td>
<td>-0.057</td>
<td>0.234</td>
<td>1.194</td>
<td>0.232</td>
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Table 2

*Mixed Regression Effects Moderator Amount of Intervention in PDT Groups*

<table>
<thead>
<tr>
<th></th>
<th>Point Estimate</th>
<th>SE</th>
<th>LL</th>
<th>UL</th>
<th>Z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slope</td>
<td>-0.002</td>
<td>0.004</td>
<td>-0.100</td>
<td>0.006</td>
<td>-0.484</td>
<td>.628</td>
</tr>
<tr>
<td>Intercept</td>
<td>0.172</td>
<td>0.139</td>
<td>-0.101</td>
<td>0.445</td>
<td>1.240</td>
<td>.215</td>
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<tr>
<td>Tau-squared</td>
<td>0.000</td>
<td>-</td>
<td>-</td>
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<td>-</td>
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<table>
<thead>
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<th></th>
<th>Q</th>
<th>df</th>
<th>p</th>
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</thead>
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<tr>
<td>Model</td>
<td>0.235</td>
<td>1</td>
<td>.628</td>
</tr>
<tr>
<td>Residual</td>
<td>1.373</td>
<td>6</td>
<td>.967</td>
</tr>
<tr>
<td>Total</td>
<td>1.607</td>
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<td>.978</td>
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</tbody>
</table>


Table 3

*Mixed Regression Effects Moderator Amount of Intervention in NonPDT Groups*

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<tr>
<th>Point Estimate</th>
<th>95% CI</th>
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<th></th>
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<td></td>
<td></td>
<td>SE</td>
<td>LL</td>
<td>UL</td>
<td>Z</td>
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<tr>
<td>Slope</td>
<td>0.002</td>
<td>0.004</td>
<td>-0.010</td>
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<td>-0.490</td>
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<tr>
<td>Intercept</td>
<td>0.174</td>
<td>0.140</td>
<td>-0.101</td>
<td>0.448</td>
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<tr>
<td>Tau-squared</td>
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<td>Residual</td>
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<td>Total</td>
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Table 4

*Mixed Regression Effects Moderator for Researcher Allegiance SumDirect PDT*

<table>
<thead>
<tr>
<th></th>
<th>Point Estimate</th>
<th>SE</th>
<th>LL</th>
<th>UL</th>
<th>Z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slope</td>
<td>0.013</td>
<td>0.082</td>
<td>−0.147</td>
<td>0.173</td>
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<td>.874</td>
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<tr>
<td>Intercept</td>
<td>0.059</td>
<td>0.201</td>
<td>−0.336</td>
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<td>Tau-squared</td>
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<table>
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<tr>
<th></th>
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<tr>
<td>Model</td>
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<td>.874</td>
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<td>Residual</td>
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<td>Total</td>
<td>5.967</td>
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<td>.876</td>
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### Table 5

*Mixed Regression Effects Moderator for Researcher Allegiance SumDirect NonPDT*

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<th>Point Estimate</th>
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<tr>
<td>Slope</td>
<td>0.054</td>
<td>0.109</td>
<td>−0.160</td>
<td>0.268</td>
<td>0.495</td>
<td>.620</td>
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<td>Intercept</td>
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<td>0.258</td>
<td>0.483</td>
<td>.629</td>
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<tr>
<td>Tau-squared</td>
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<td>Residual</td>
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<td>Total</td>
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Table 6

*Mixed Regression Effects Moderator for Researcher Allegiance SumIndirect PDT*

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<th>Point Estimate</th>
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<td></td>
<td>LL</td>
<td>UL</td>
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<td>Slope</td>
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<td>0.174</td>
<td>0.088</td>
<td>0.930</td>
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<tr>
<td>Intercept</td>
<td>0.063</td>
<td>0.295</td>
<td>−0.516</td>
<td>0.642</td>
<td>0.214</td>
<td>0.831</td>
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<tr>
<td>Tau-squared</td>
<td>0.000</td>
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<td>-</td>
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<tbody>
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<td>Model</td>
<td>0.008</td>
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<td>0.930</td>
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<tr>
<td>Residual</td>
<td>5.959</td>
<td>10</td>
<td>0.819</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>5.967</td>
<td>11</td>
<td>0.876</td>
<td>-</td>
<td>-</td>
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</table>
### Table 7

*Mixed Regression Effects Moderator for Researcher Allegiance SumIndirect NonPDT*

<table>
<thead>
<tr>
<th></th>
<th>Point Estimate</th>
<th>SE</th>
<th>LL</th>
<th>UL</th>
<th>Z</th>
<th>p</th>
</tr>
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<tbody>
<tr>
<td>Slope</td>
<td>−0.006</td>
<td>0.085</td>
<td>−0.173</td>
<td>0.161</td>
<td>−0.073</td>
<td>.941</td>
</tr>
<tr>
<td>Intercept</td>
<td>0.099</td>
<td>0.160</td>
<td>−0.216</td>
<td>0.414</td>
<td>0.616</td>
<td>.538</td>
</tr>
<tr>
<td>Tau-squared</td>
<td>0.000</td>
<td>-</td>
<td>-</td>
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<table>
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<tr>
<th></th>
<th>Q</th>
<th>df</th>
<th>p</th>
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</thead>
<tbody>
<tr>
<td>Model</td>
<td>0.005</td>
<td>1</td>
<td>.941</td>
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<tr>
<td>Residual</td>
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<td>10</td>
<td>.818</td>
</tr>
<tr>
<td>Total</td>
<td>5.967</td>
<td>11</td>
<td>.876</td>
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</tbody>
</table>
Table 8

*Mixed Regression Effects Moderator for Researcher Allegiance in Overall*

<table>
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<th></th>
<th>Point Estimate</th>
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<th>LL</th>
<th>UL</th>
<th>Z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slope</td>
<td>−0.188</td>
<td>0.299</td>
<td>−0.774</td>
<td>0.398</td>
<td>−0.628</td>
<td>.538</td>
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<tr>
<td>Intercept</td>
<td>0.827</td>
<td>1.179</td>
<td>−1.483</td>
<td>3.137</td>
<td>0.701</td>
<td>.482</td>
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<tr>
<td>Tau-squared</td>
<td>0.000</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<table>
<thead>
<tr>
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<th>df</th>
<th>p</th>
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</thead>
<tbody>
<tr>
<td>Model</td>
<td>0.394</td>
<td>1</td>
<td>.538</td>
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<td>Residual</td>
<td>5.572</td>
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<td>.850</td>
</tr>
<tr>
<td>Total</td>
<td>5.967</td>
<td>11</td>
<td>.876</td>
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</table>
Figure 1

Flow Diagram for Search Process of PDT vs. CBT and IDC for SUD Meta-Analysis

Figure 2

Funnel Plot of Standard Error by Std diff in means
Random Effects Meta-Analysis for Comparisons of PDT to Drug Counseling/CBT

<table>
<thead>
<tr>
<th>STUDY NAME</th>
<th>Eta</th>
<th>Statistics for each study</th>
<th>Std diff in means and 95% CI</th>
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<tbody>
<tr>
<td>Citri-Christophel et al. (1999/2013)</td>
<td>0.078</td>
<td>0.135</td>
<td>0.018</td>
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<tr>
<td>Gagnon et al. (1983)</td>
<td>0.025</td>
<td>0.262</td>
<td>0.263</td>
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<tr>
<td>Greco et al. (2002/Gregory et al. (2013)</td>
<td>0.130</td>
<td>0.309</td>
<td>0.260</td>
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<tr>
<td>Study b (1973)</td>
<td>0.000</td>
<td>0.260</td>
<td>0.019</td>
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<tr>
<td>Vodaly et al. (1983)</td>
<td>0.039</td>
<td>0.439</td>
<td>0.062</td>
</tr>
<tr>
<td>Vodaly et al. (1983)</td>
<td>0.074</td>
<td>0.225</td>
<td>0.000</td>
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<td>Helstien et al. (1993)</td>
<td>0.444</td>
<td>0.319</td>
<td>0.089</td>
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<td>Sandahl et al. (2006)</td>
<td>0.164</td>
<td>0.354</td>
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</tr>
<tr>
<td>Suchman et al. (1970)</td>
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<td>0.312</td>
<td>0.099</td>
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<tr>
<td>Suchman et al. (1970)</td>
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<td>0.220</td>
<td>0.040</td>
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<tr>
<td>Halliday (1960)</td>
<td>0.021</td>
<td>0.202</td>
<td>0.004</td>
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<tr>
<td>Pickles et al. (2013)</td>
<td>0.028</td>
<td>0.074</td>
<td>0.005</td>
</tr>
</tbody>
</table>

Favours A  Favor B