

Four-Session Transcending Self Therapy for Substance use, Depression, and Treatment Retention among Veterans with Substance use Disorders: A Pilot Study

Kathryn Polak^{1*}, Thomas Burroughs², Jarrod Reisweber² and James M Bjork^{2,3}

¹Department of Clinical Psychology Doctoral Candidate, Virginia Commonwealth University, Richmond, VA, USA

²Hunter Holmes McGuire Veterans Administration Medical Center, Richmond, VA, USA

³Department of Psychiatry, Virginia Commonwealth University, Richmond, VA, USA

*Corresponding author: Kathryn Polak, Clinical Psychology Doctoral Candidate, Department of Psychology, Virginia Commonwealth University, Franklin St. Richmond, VA, USA, Tel: 804-477-5091; E-mail: polakkm@vcu.edu

Received date: February 03, 2019; Accepted date: April 18, 2019; Published date: April 24, 2019

Copyright: © 2019 Polak K, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Abstract

Objective: Increased rates of Substance Use Disorders (SUDs) have been found among veterans compared to the general population. Efficacious interventions that reduce substance abuse in veterans are of central importance. To address this need, the Transcending Self Therapy: Four-Session Individual Integrative Cognitive Behavioral Treatment (TST) was developed. TST is an adjunctive individual therapy for group-based intensive SUD treatment. We conducted a preliminary investigation into whether veterans assigned to TST show significantly improved treatment outcomes compared to treatment-as-usual (TAU) individual therapy.

Methods: Participants were N=35 veterans enrolled in a four-week intensive outpatient program (IOP) at an urban Veterans Administration Medical Center. Those slated for IOP were assigned randomly to four weekly sessions of either TST or TAU. At baseline, veterans completed psychometric assessments of SUD and mental health. At IOP completion, participants completed mental health and neurocognitive assessments.

Results: Compared to the TAU group, TST patients were twice as likely to complete IOP treatment (100% vs 50%; $p=0.002$) and to be abstinent in the final week of IOP (84.6% vs 40.9%; $p=0.01$). TST-assigned patients (but not TAU patients) also showed significant reductions in depression over time (group X time interaction, $p=0.002$), and showed trends toward being less likely to transition to a higher level of SUD care ($p=0.06$) and for quality of life scores to increase more over time (group X time interaction, $p=0.068$).

Conclusions: These preliminary data indicate that TST may be an effective individual therapy supplement to group-based SUD therapy in veterans. A multi-site clinical trial of TST with more practitioners and assessments could replicate and establish generalizability of these findings.

Keywords: Substance use disorder; Cognitive behavior therapy; Veterans; Brief intervention; Integrative therapy; Treatment outcome

Introduction

Substance abuse is a serious public health concern among veterans. Substance Use Disorders (SUDs) are associated with substantial psychosocial and health consequences as well as an increased likelihood of comorbidity with other psychiatric conditions [1,2]. The prevalence of SUDs and other mental health issues is higher among veterans compared to the general population [3-5]. This may, in part, be due to veterans consuming substances to cope with psychological responses linked to military experiences and engaging in greater risk-taking behaviour [6-11].

In response to the needs of this high-risk population, the US Veterans Health Administration (VA) is focusing attention on increasing provision of effective treatment for SUDs [12]. Cognitive Behavior Therapy (CBT) is one of the most empirically validated psychotherapies for SUDs and is one such treatment being provided by the VA for substance abuse [13]. During CBT, patients explore how

their thoughts, feelings, and behaviors are connected. By doing so, patients are able to discover the unhealthy thinking patterns and beliefs that result in negative behaviors and feelings. The therapist and patient then collaboratively work to promote positive ways of interpreting social stimuli and other external events that engender healthy behaviors and improved emotional wellbeing [14].

Additionally, there has been an increasing emphasis on brief interventions, an evidence-based approach for treating substance abuse [15]. For example, substantial attention has been focused on investigations of VA implementation and dissemination of Screening, Brief Intervention, and Referral to Treatment (SBIRT) [16]. Such initiatives have been fueled by the increasing need to efficiently and effectively treat veterans for SUD [12]. However, while four-session CBT has been shown to be effective in improving outcomes among chronic pain patients, investigations of brief CBT for the treatment of SUDs have been limited [17].

To meet the increasing need for brief, efficacious interventions to assist veterans in reducing substance abuse, the evidence-informed Transcending Self Therapy: Four-Session Individual Integrative

Cognitive Behavioral Treatment (TST) was developed [18]. TST is an adjunctive individual therapy that functions as part of intensive group-based SUD treatment [18]. The TST model is based on efficacious brief interventions, with format driven in part from patient feedback [18]. TST incorporates traditional CBT and addresses spiritual factors when clinically indicated, similar to what was described by Reisweber in this way, TST clinicians operate from a biopsychosocial-spiritual model [19]. The biopsychosocial-spiritual model acknowledges and utilizes the spiritual belief system a patient holds and incorporates it into the change process when possible [20]. TST sessions focus on identifying and changing unhealthy thinking and behavioral patterns as core elements of CBT. It places an emphasis on problem-solving, coping skills, and goal-setting that allows the patient to better connect to others and a passionate pursuit that is in line with their moral compass [18]. At each session, structured worksheets are utilized, and homework is assigned to facilitate CBT-based skill building [18].

This internally-funded programmatic investigation aimed to collect preliminary evidence about whether SUD and other mental health outcomes improved more in veterans assigned to TST therapy compared to veterans assigned to supportive solution-focused intervention and case management that includes elements of CBT and Motivational Enhancement Therapy (Treatment as Usual; TAU). This was conducted in an effort to help inform Mental Health Service programming decisions at our facility and related VA facilities. We hypothesized that, compared to TAU patients, participants of the TST group would have significantly improved depression, quality of life, treatment retention, and substance use outcomes at treatment conclusion compared to baseline assessment.

Method

Participants

Participants were N=35 non-legally involved (not court-ordered to complete treatment, on probation, or pending charges or court dates) veterans enrolled in the Substance Abuse Treatment Program (SATP) Intensive Outpatient Program (IOP) at the Hunter Holmes McGuire Veterans Administration Medical Center (RICVAMC) in Richmond, Virginia.

Procedure

The study was reviewed and received ethical approval by the RICVAMC Institutional Review Board. Veterans slated for the four-week SATP IOP were assigned to four weekly individual therapy sessions with either a TST or a TAU practitioner. Our method of participant assignment to treatment arms was akin to a block randomization that accommodated the imperative to get each veteran individualized care as soon as a practitioner appointment slot was available. Veterans initially assigned to the participating subset of RICVAMC substance abuse IOP providers were further assigned to individual practitioners approximately weekly and randomly in the context of provider availability. Veterans were enrolled based on the date of their intake, and all veterans began treatment within 30 days of them seeking treatment. Once all slots with either TST practitioners or all slots with TAU providers were completely full, veterans with the most recent date of seeking treatment were automatically assigned to open slots of the other treatment/providers until slots were full. Assignments were therefore not based on demographics, SUD severity, comorbidities, or other clinical characteristics. Veterans provided informed consent and Health Insurance Portability and Accountability

Act of 1996 (HIPAA) authorization, then completed a 20-minute baseline psychometric assessment battery (see below).

Veterans then participated in their treatment program and attended weekly individual TST or TAU sessions (four total). At the conclusion of IOP, participants completed a 60-minute follow-up assessment with paper-and-pencil instruments, computerized impulsivity tasks, and the *Delis-Kaplan Executive Function System (D-KEFS)* Tower Test. The order of administration of computerized tasks and the D-KEFS was randomized. Participants were given \$20 for completing the baseline visit and \$30 for completing the follow-up visit.

Assessments

Baseline: The assessments were selected based on commonality of use and acceptable or better test-retest reliability across an interval of several weeks. The Use subscale score of the 17-item Brief Addiction Monitor (BAM; test-retest reliability >0.50 for all but two items), was used to assess past 30 days substance use [21]. Total score on the 30-item Barratt Impulsiveness Scale (BIS-11; reliability=0.83) was used as a measure of trait impulsivity [22,23]. DSM-5 symptoms of Post-Traumatic Stress Disorder (PTSD) were measured using the total score of the 20-item PTSD Checklist-5 (PCL5 reliability=0.83) [24,25]. Anxiety levels were assessed using the total score of the 21-item Beck Anxiety Inventory (BAI; reliability=0.67) [26,27]. Depressive symptom severity was measured with the total score of the 21-item Beck Depression Inventory-II (BDI-II; reliability=0.73) [28,29]. Positive mental health, wellbeing, and happiness was measured using the overall score of the 32-item Quality of Life Inventory (QoLI; total score; reliability=0.80) [30,31]. Lastly, demographics variables (age, gender, and race/ethnicity) were obtained from the electronic medical record.

Follow-up: We re-administered the BIS-11, QoLI, and BDI-II. Additionally, the following substance use and treatment measures were obtained from the electronic medical record: treatment retention (i.e., completed IOP); transition from IOP to a higher level of SUD care (residential treatment or inpatient detox); toxicology verified abstinence (proportion of positive urine drug screens [UDS]); and abstinence in the final week of IOP treatment.

Data analysis

Mixed-model analysis of variance (ANOVA) with repeated measures were used to determine the effect of TST vs. TAU groups on BDI-II and QoLI scores as group X time interaction effects. IOP treatment outcome and substance use data were compared across the two treatment groups using chi-square analyses and independent t-tests. All analyses were carried out using SPSS version 24. Items determined to be outliers (identified using the boxplot method) or with missing information were excluded from analyses involving that specific item. Follow-up measures completed greater than two weeks after the IOP completion date were excluded from analyses.

Results

Patient characteristics

The sample was almost all male (94.3%), roughly half African American (54.3%) and half Caucasian (45.7%). Mean age was 56.40 years (*SD*=12.54). As shown in Table 1, those assigned to the TST group had significantly higher BDI-II scores at baseline compared

to those in the TAU group ($t(33) = -2.30, p=0.03$). No other significant differences were found between groups for baseline variables.

Variable	TST (N=13)	TAU (N=22)	Statistics
Age	55.54 (14.70)	56.91 (11.41)	$t=0.31; p=0.76$
Gender (% male)	92.30%	95.50%	*
Race/ethnicity			$\chi^2=0.55; p=0.46$
Caucasian	53.80%	40.90%	
African-American	46.20%	59.10%	
BIS total score	73.92 (13.15)	74.00 (14.25)	$t=0.02; p=0.99$
BAM use score	5.08 (3.10)	4.41 (3.43)	$t=-0.58; p=0.57$
PCL-5 total score	47.77 (20.12)	43.05 (19.20)	$t=-0.69; p=0.50$
BAI total score	26.23 (16.92)	23.32 (14.78)	$t=-0.53; p=0.60$
BDI-II total score	29.46 (13.48)	20.14 (10.34)	$t=-2.30; p=0.03^{**}$
QoLI total score	25.54 (15.45)	32.33 (15.66)	$t=1.24; p=0.23$

*Only N=2 participants were female; ** $p<0.05$.

Table 1: Baseline comparisons of groups on demographic and patient description items (N=35).

Variable	TST	TAU	Statistics
Treatment retention (% completed)	100%	50%	$\chi^2=9.48; p=0.002^*$
Transitioned to higher level of care (residential or inpatient detox) (% yes)	0%	22.70%	$\chi^2=3.45; p=0.06$
Proportion of UDS positive (toxicology verified abstinence)	0.25 (0.38)	0.51 (0.46)	$t= -1.70; p=0.10$
Abstinent final week of IOP treatment	84.60%	40.90%	$\chi^2=6.37; p=0.01^*$

* $p<0.05$

Table 2: Substance use and treatment variables by treatment group.

Discussion

Principal findings

This was a demonstration project of Transcending Self Therapy: Four Session Individual Integrative Cognitive Behavioral Treatment (TST), a brief adjunctive individual therapy for group-based intensive SUD treatment. Consistent with our hypothesis, those in the TST group were more likely to complete IOP treatment and be abstinent in the final week of IOP compared to TAU patients. Additionally, we found TST-assigned patients showed significant reductions in depression over time, with minimal decreases in IOP TAU patients whose adjunctive weekly individualized therapy sessions were composed of supportive solution-focused intervention and case management that includes elements of CBT and Motivational Enhancement Therapy. These results potentially support the continued application of TST individual therapy compared to TAU as part of IOP treatment in the RICVAMC veteran. The results may also provide support for investigation of TST individual treatment effectiveness in other settings.

Depression and quality of life

There was a significant group X time interaction effect on BDI-II score ($F(1,28) = 12.17, p=0.002$), where TST-assigned patients showed statistically significant reductions in BDI-II scores over time, with minimal reduction in the TAU group. There was no significant difference between TST and TAU groups for post-treatment endorsement of suicidal ideation on the BDI-II (7.7% vs. 23.5%; $p=0.25$). The treatment group X time interaction effect on QoLI score did not reach significance, ($F(1, 28) = 3.60, p=0.068$).

Substance use and treatment engagement

As shown in Table 2, patients in the TST group were twice as likely as those in the TAU group to complete IOP treatment (100% vs. 50%; $p=0.002$). Additionally, TAU showed a trend to be more likely to transition to a higher level of SUD care compared to TST participants (22.7% vs. 0%; $p=0.06$).

The proportion of UDS-positive urines in the TST group ($M=0.25, SD=0.38$) was half that of those in the TAU group ($M=0.51, SD=0.46$), $t(32) = -1.70, p=0.10$. Patients in the TST group were over twice as likely as those in the TAU group to be abstinent in the final week of IOP (84.6% vs. 40.9%; $p=0.01$).

Compared to TAU patients, those in the TST group were more likely to complete IOP treatment and be abstinent in the final week of IOP. These results are particularly meaningful given that treatment retention has been linked with reductions in substance use and 12-month post-treatment abstinence [32-35]. Additionally, our results are consistent with previous findings that behavioral approaches are associated with substance abuse treatment retention (e.g., behavioral couples therapy) [36].

Whereas TST patients showed significant reductions in depression over time, TAU patients demonstrated minimal reduction. There was also a trend toward an improvement in QoLI scores in TST patients but not TAU patients. This reflects how CBT is a long-standing evidence-based treatment for depression and, more recently, brief CBT-based interventions have been found to be effective in addressing depressive symptoms [37,38].

While Baker et al. found that CBT-based interventions were linked to significant decreases in alcohol use and depressive symptoms, others have not found significant reductions in depression [39-43]. Those studies that found collateral improvement in depression may have featured precise interventions that better reduced drinking itself, to

result in a more robust downstream effect on reducing depression. More focused research that disentangles these possibilities using longitudinal collection of brain and neurobehavioral biomarkers is of great interest.

The integrative-CBT-based TST individual therapy was likely effective for a variety of reasons. It is hard to parse out what aspects of TST had the greatest impact. The theorists who developed the protocol hypothesized that it was the integrative nature of the CBT and the fact that it utilized a biopsychosocial-spiritual model. As part of the TST manual, therapists were instructed to view their patients as having a need to seek meaning. For many patients, this appeared to be a powerful process that may have had the effect of improving their retention in treatment. At times, this led to discussions of spiritual beliefs, when brought up by the patient. The positive impact of discussing spirituality when clinically indicated is consistent with the findings of Martinez et al. where patients appreciated these discussions [44]. Therapists of the TST arm were also encouraged to process their patients' hot cognitions as they arose. In doing so, some patients could identify and change the thinking and behavior patterns that were impacting their ability to connect to others and transcend themselves. This was reported by some patients to result in a goal that motivated them to not use drugs or alcohol during difficult times.

Parenthetically, we also conducted a series of exploratory assessments of impulsivity at follow-up, and found no differences between treatment groups in either devaluation of delayed rewards in the delay-discounting task, commission error rates in the emotional-face go-no-go task, scores on the Barratt Impulsiveness Scale (BIS), or scores of the *Delis-Kaplan Executive Function System (D-KEFS)* Tower Test (data not shown) [45-47]. This suggested that TST-group improvements were not likely mediated by substantial reductions in myopic decision-making or improvements in executive functions.

Limitations

There are several limitations to the present study. First, the sample was restricted to veterans, and results may not generalize to the broader population of individuals with SUDs. Nonetheless, this is an important and particularly vulnerable subgroup, which has been linked with increased substance use and problems [3]. Second, for unknown reasons, patients assigned to TST had higher depression at baseline, despite how patients were assigned akin to block randomization to TST versus TAU in the context of transient fluctuations in TST and TAU provider availability. While this afforded the TST group more room for improvement, their more severe baseline depression likely "stacked the deck" against SUD treatment motivation and retention generally and made their retention all the more remarkable [48,49]. We surmise that this baseline difference was likely a chance consequence of the small sample size of a pilot program evaluation project. Third, since each practitioner administered only one treatment approach (TST vs TAU), treatment approach was confounded by practitioner. Fourth, due to cost and logistical constraints of a program evaluation, neurocognition was only assessed at follow-up, and self-reported substance use was only assessed using a standardized measure (BAM) at baseline. However, key substance use measures (UDS results and self-reported substance use) were nevertheless available in the medical chart. Finally, our sample size was likely too small to reveal potential significant differences between treatment groups for some variables (e.g., QoLI score). However, our

sample was determined to be suitable for an initial evaluation of the TST at our facility.

Future Research

Because the current study only provides preliminary evidence of the potential efficacy of TST for addressing SUD and depressive symptoms in a small sample of veterans, a more formal randomized controlled trial of TST with more sophisticated symptom-matching randomization (e.g. urn randomization) and random assignment of practitioners to treatment arms may be warranted. A larger sample size could provide sufficient power for subgroup analyses (e.g., comparing outcomes based on type of SUD, SUD severity level, and comorbidity). Additionally, to assess generalizability and variation in effectiveness attributable to practitioners, future trials could include implementation at multiple sites, and in the context of other treatment programs. Lastly, given the recent National Institute of Mental Health focus on understanding mechanisms of intervention effects, further investigation is needed into the relationship between SUD, neurocognitive function, and TST treatment [50].

Conclusion

Our investigation examined whether veterans assigned to TST therapy had improvements in SUD and other mental health outcomes post-treatment compared to TAU veterans. Key findings were that those in the TST group had greater treatment retention, improved depression over time, and reduced substance use compared to TAU patients. Additionally, TAU patients showed a trend to be more likely to transition to a higher level of SUD care compared to TST participants. TST patients also showed a trend for improvement in quality of life over time compared to TAU patients. Our results provide preliminary evidence supporting the potential efficacy of TST individual therapy for those with SUDs in intensive group-based treatment, and so provide grist for continued investigation of TST for the treatment of SUDs.

Acknowledgements

This project was supported by a grant from the VA Mid-Atlantic Mental Illness Research, Education and Clinical Center (VISN 6 MIRECC) of the Department of Veterans Affairs Office of Mental Health Services, the VA Mid-Atlantic Healthcare Network (VISN 6). We would like to thank the staff of the Hunter Holmes McGuire Veterans Administration Medical Center (RICVAMC) Substance Abuse Treatment Program (SATP) who contributed to the outcome of this study and manuscript.

References

1. Caldwell TM, Rodgers B, Jorm AF, Christensen H, Jacomb PA, et al. (2002) Patterns of association between alcohol consumption and symptoms of depression and anxiety in young adults. *Addiction* 97: 583-594.
2. Holahan CJ, Schutte KK, Brennan PL, Holahan CK, Moos RH (2014) Episodic heavy drinking and 20-year total mortality among late-life moderate drinkers. *Alcohol Clin Exp Res* 38: 1432-1438.
3. Seal KH, Bertenthal D, Miner CR, Sen S, Marmar C (2007) Bringing the war back home: mental health disorders among US veterans returning from Iraq and Afghanistan seen at Department of Veterans Affairs facilities. *Arch Intern Med* 167: 476-482.

4. Ramsey C, Dziura J, Justice AC, Altalib HH, Bathulapalli H, et al. (2017) Incidence of Mental Health Diagnoses in Veterans of Operations Iraqi Freedom, Enduring Freedom, and New Dawn, 2001-2014. *Am J Public Health* 107: 329-335.
5. Wisco BE, Marx BP, Wolf EJ, Miller MW, Southwick SM, et al. (2014) Posttraumatic stress disorder in the US veteran population: results from the National Health and Resilience in Veterans Study. *J Clin Psychiatry* 75: 1338-1346.
6. Jacobson IG, Ryan MA, Hooper TI, Smith TC, Amoroso PJ, et al. (2008) Alcohol use and alcohol-related problems before and after military combat deployment. *JAMA* 300: 663-675.
7. Norman SB, Tate SR, Anderson KG, Brown SA (2007) Do trauma history and PTSD symptoms influence addiction relapse context? *Drug Alcohol Depend* 90: 89-96.
8. Wilk JE, Bliese PD, Kim PY, Thomas JL, McGurk D, et al. (2010) Relationship of combat experiences to alcohol misuse among U.S. soldiers returning from the Iraq war. *Drug Alcohol Depend* 108: 115-121.
9. Killgore WD, Cotting DI, Thomas JL, Cox AL, McGurk D, et al. (2008) Post-combat invincibility: violent combat experiences are associated with increased risk-taking propensity following deployment. *J Psychiatr Res* 42: 1112-1121.
10. Vest BM, Homish DL, Fillo J, Homish GG (2018) Military status and alcohol problems: Former soldiers may be at greater risk. *Addict Behav* 84: 139-143.
11. Schuman DL, Bricout J, Peterson HL, Barnhart S (2019) A systematic review of the psychosocial impact of emotional numbing in US combat veterans. *J Clin Psychol* 75: 644-663.
12. Ducharme LJ, Chandler RK, Harris AH (2016) Implementing Effective Substance Abuse Treatments in General Medical Settings: Mapping the Research Terrain. *J Subst Abuse Treat* 60: 110-118.
13. Butler AC, Chapman JE, Forman EM, Beck AT (2006) The empirical status of cognitive-behavioral therapy: A review of meta-analyses. *Clin Psychol Rev* 26: 17-31.
14. Beck JS (2011) *Cognitive Behavior Therapy, Second Edition: Basics and Beyond*. Guilford Press.
15. Jhanjee S (2014) Evidence based psychosocial interventions in substance use. *Indian J Psychol Med* 36: 112-118.
16. Broyles LM, Kraemer KL, Kengor C, Gordon AJ (2013) A tailored curriculum of alcohol screening, brief intervention, and referral to treatment (SBIRT) for nurses in inpatient settings. *J Addict Nurs* 24: 130-141.
17. Turner JA, Mancl L, Aaron LA (2006) Short- and long-term efficacy of brief cognitive-behavioral therapy for patients with chronic temporomandibular disorder pain: A randomized, controlled trial. *Pain* 121: 181-194.
18. Polak KM, Reisweber J (2016) *Transcending Self Therapy: Four-Session Individual Integrative Cognitive Behavioral Treatment*. Unpublished manual.
19. Reisweber J (2011) Psychology of Religion from a Transcendent Self Theory Perspective. 1-157.
20. Saad M, de Medeiros R, Mosini AC (2017) Are We Ready for a True Biopsychosocial-Spiritual Model? The Many Meanings of "Spiritual". *Medicines (Basel)* 4: 79.
21. Cacciola JS, Alterman AI, DePhilippis D, Drapkin ML, Valadez, Jr C, et al. (2013) Development and Initial Evaluation of the Brief Addiction Monitor (BAM). *J Subst Abuse Treat* 44: 256-263.
22. Patton JH, Stanford MS, Barratt ES (1995) Factor structure of the Barratt impulsiveness scale. *J Clin Psychol* 51: 768-774.
23. Stanford MS, Mathias CW, Dougherty DM, Lake SL, Anderson NE, et al. (2009) Fifty years of the Barratt Impulsiveness Scale: An update and review. *Personality and Individual Differences* 47: 385-395.
24. Weathers FW, Litz BT, Keane TM, Palmieri PA, Marx BP, et al. (2013) The PTSD Checklist for DSM-5 (PCL-5). Scale available from the National Center for PTSD.
25. Blevins CA, Weathers FW, Davis MT, Witte TK, Domino JL (2015) The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5): Development and Initial Psychometric Evaluation. *J Trauma Stress* 28: 489-498.
26. Beck AT, Aaron T, Steer RA (1993) *Beck Anxiety Inventory Manual*. San Antonio, TX: Psychological Corporation.
27. Fydrich T, Dowdall D, Chambless DL (1992) Reliability and validity of the beck anxiety inventory. *Journal of Anxiety Disorders* 6: 55-61.
28. Beck AT, Steer RA, Brown GK (1996) *Beck Depression Inventory: second edition manual*. San Antonio (TX): The Psychological Corporation.
29. Wang YP, Gorenstein C (2013) Psychometric properties of the Beck Depression Inventory-II: a comprehensive review. *Braz J Psychiatry* 35: 416-431.
30. Frisch MB (1994) *Quality of life inventory: manual and treatment guide*. National Computer Systems, Minneapolis.
31. Frisch MB, Cornell J, Villanueva M, Retzlaff, Paul J (1992) Clinical validation of the Quality of Life Inventory. A measure of life satisfaction for use in treatment planning and outcome assessment. *Psychological Assessment* 4: 92-101.
32. Williamson DF, Parker RA, Kendrick JS (1989) The box plot: a simple visual method to interpret data. *Ann Intern Med* 110: 916-921.
33. Chou CP, Hser YI, Anglin MD (1998) Interaction effects of client and treatment program characteristics on retention: an exploratory analysis using hierarchical linear models. *Subst Use Misuse* 33: 2281-2301.
34. Simpson D, Joe G, Brown B (1997) Treatment retention and follow-up outcomes in the Drug Abuse Treatment Outcome Study (DATOS). *Psychology of Addictive Behaviors* 11: 294-307.
35. Peles E, Linzy S, Kreek M, Adelson M (2008) One-year and cumulative retention as predictors of success in methadone maintenance treatment: a comparison of two clinics in the United States and Israel. *J Addict Dis* 27: 11-25.
36. Stanton MD, Shandish WR (1997) Outcome, attrition, and family-couples treatment for drug abuse: a meta-analysis and review of the controlled, comparative studies. *Psychol Bull* 122: 170-191.
37. Driessen E, Hollon SD (2010) Cognitive behavioral therapy for mood disorders: efficacy, moderators and mediators. *Psychiatr Clin North Am* 33: 537-555.
38. McNaughton JL (2009) Brief interventions for depression in primary care: a systematic review. *Can Fam Physician* 55: 789-796.
39. Baker AL, Thornton LK, Hiles S, Hides L, Lubman DI (2012) Psychological interventions for alcohol misuse among people with co-occurring depression or anxiety disorders: a systematic review. *J Affect Disord* 139: 217-229.
40. Milosevic I, Chudzik SM, Boyd S, McCabe RE (2017) Evaluation of an integrated group cognitive-behavioral treatment for comorbid mood, anxiety, and substance use disorders: A pilot study. *J Anxiety Disord* 46: 85-100.
41. Hesse M (2009) Integrated psychological treatment for substance use and co-morbid anxiety or depression vs. treatment for substance use alone. A systematic review of the published literature. *BMC Psychiatry* 9: 6.
42. Riper H, Andersson G, Hunter SB, de Wit J, Berking M, et al. (2014) Treatment of comorbid alcohol use disorders and depression with cognitive-behavioural therapy and motivational interviewing: a meta-analysis. *Addiction* 109: 394-406.
43. Hunter SB, Watkins KE, Hepner KA, Paddock SM, Ewing BA, et al. (2012) Treating depression and substance use: a randomized controlled trial. *J Subst Abuse Treat* 43: 137-151.
44. Martinez JS, Smith TB, Barlow SH (2007) Spiritual interventions in psychotherapy: Evaluations by highly religious clients. *J Clin Psychol* 63: 943-960.
45. Bickel WK, Koffarnus MN, Moody L, Wilson AG (2014) The behavioral and neuro-economic process of temporal discounting: A candidate behavioral marker of addiction. *Neuropharmacology* 76: 518-527.

46. Tottenham N, Hare TA, Casey BJ (2011) Behavioral assessment of emotion discrimination, emotion regulation, and cognitive control in childhood, adolescence, and adulthood. *Front Psychol* 2: 39.
47. Delis DC, Kaplan E, Kramer JH (2001) Delis-Kaplan Executive Function System (D-KEFS). San Antonio, TX: The Psychological Corporation.
48. Compton WM 3rd, Cottler LB, Jacobs JL, Ben-Abdallah A, Spitznagel EL (2003) The role of psychiatric disorders in predicting drug dependence treatment outcomes. *Am J Psychiatry* 160: 890-895.
49. Litz M, Leslie D (2017) The impact of mental health comorbidities on adherence to buprenorphine: A claims based analysis. *Am J Addict* 26: 859-863.
50. Insel TR, Gogtay N (2014) National Institute of Mental Health clinical trials: new opportunities, new expectations. *JAMA Psychiatry* 71: 745-746.