Published in final edited form as:

J Psychoactive Drugs. 2014 ; 46(2): 85–92. doi:10.1080/02791072.2013.876521.

Cognitive-behavioral therapy in depressed primary care patients with co-occurring problematic alcohol use: effect of telephone-administered vs. face-to-face treatment – A secondary analysis

Raj K. Kalapatapu, MD^{1,2}, Joyce Ho, PhD³, Xuan Cai, MS³, Sophia Vinogradov, MD^{1,2}, Steven L. Batki, MD^{1,2}, and David C. Mohr, PhD³

¹Department of Psychiatry, University of California, San Francisco, California

²San Francisco Veterans Affairs Medical Center, San Francisco, California

³Department of Preventive Medicine, Northwestern University Feinberg School of Medicine, Chicago, Illinois

Abstract

This secondary analysis of a larger study compared adherence to telephone-administered cognitive-behavioral therapy (T-CBT) vs. face-to-face CBT and depression outcomes in depressed primary care patients with co-occurring problematic alcohol use. To our knowledge, T-CBT has never been directly compared to face-to-face CBT in such a sample of primary care patients. Participants were randomized in a 1:1 ratio to face-to-face CBT or T-CBT for depression. Participants receiving T-CBT ($n = 50$) and face-to-face CBT ($n = 53$) were compared at baseline, end of treatment (week 18), and 3-month and 6-month follow-ups. Face-to-face CBT and T-CBT groups did not significantly differ in age, sex, ethnicity, marital status, educational level, severity of depression, antidepressant use and total score on the Alcohol Use Disorders Identification Test. Face-to-face CBT and T-CBT groups were similar on all treatment adherence outcomes and depression outcomes at all timepoints. In conclusion, T-CBT and face-to-face CBT had similar treatment adherence and efficacy for the treatment of depression in depressed primary care patients with co-occurring problematic alcohol use. When targeting patients who might have difficulties in accessing care, primary care clinicians may consider both types of CBT delivery when treating depression in patients with co-occurring problematic alcohol use.

Keywords

telephone; face-to-face; depressed; alcohol; primary care

Address correspondence to: Raj K. Kalapatapu, M.D., Department of Psychiatry, San Francisco Veterans Affairs Medical Center, Opioid Replacement Treatment Clinic, 4150 Clement Street, Mailstop 116F, Building 1, Ground Floor, San Francisco, CA 94121, Phone: (415) 221-4810 ext. 3075, Fax: (415) 750-2152, kalapatapu.raj.k@gmail.com.

CONFLICTS OF INTEREST

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this paper.

INTRODUCTION

Primary care patients represent a population with a significant prevalence of substance use disorders (Alam & Martorana 2011; Pilowsky & Wu 2012). Behavioral interventions, such as cognitive-behavioral therapy (CBT), motivational interviewing and brief counseling, have been used to treat substance use disorders in primary care (Babor et al. 2007; Gordon et al. 2008; Pilowsky & Wu 2012). Regarding CBT, face-to-face CBT has been used to treat primary care patients with primary substance use disorders (Funderburk et al. 2011; Kay-Lambkin et al. 2009; O'Malley et al. 2003; Wittchen et al. 2011) and dual diagnoses of substance use disorders and depression (Garcia Campayo et al. 2008; Kay-Lambkin et al. 2011). However, financial and organizational resources are usually limited in primary care (Johnson et al. 2011; Turner 2009; Van Hook et al. 2007). Some patients, such as those living in urban areas with time-consuming travel arrangements or those living in rural areas, might have difficulties in accessing care (Borders & Booth 2007; Miller et al. 2006), leading to high treatment attrition rates; accessing care is particularly difficult for those patients in rural areas with primary substance use disorders (Borders & Booth 2007; Gamm 2004; Jackson & Shannon 2012; Sexton et al. 2008; Wood 2008) and co-occurring psychiatric diagnoses (Anderson & Gittler 2005; Ouimette et al. 2007). Such limitations warrant comparing non face-to-face methods with face-to-face methods of CBT delivery for primary care patients with primary substance use disorders and co-occurring psychiatric diagnoses.

Telephone delivery is one non face-to-face method, and literature has found telephone-administered interventions to be feasible (Carter et al. 2008; Hubbard et al. 2007; Mbilinyi et al. 2011; McKay et al. 2011) and effective in individuals with a substance use disorder in primary care (Bischof et al. 2008; Brown et al. 2007; Oslin et al. 2003; Stotts, Diclemente & Dolan-Mullen 2002; Tait et al. 2007; Zanjani, Bush & Oslin 2010; Zanjani et al. 2008) and addiction-focused settings (Cacciola et al. 2008; Chong & Herman-Stahl 2003; Godley et al. 2010; Hall & Huber 2000; Horng & Chueh 2004; Karno et al. 2012; McKay et al. 2010; Mulleady 2001; Parker, Turk & Busby 2002; Rus-Makovec & Cebasek-Travnik 2008). Telephone delivery is commonly believed to overcome treatment barriers present in traditional face-to-face delivery. However, telephone methodology cannot be assumed to be similar to face-to-face methodology (McKinstry et al. 2010; Pridemore, Damphousse & Moore 2005). The literature on comparing telephone-administered CBT (T-CBT) with traditional face-to-face CBT for substance use disorders in any setting is limited (Currie et al. 2004; Killen et al. 2008). The literature is even more scant in dually diagnosed primary care patients and in primary care patients with problematic substance use. To our knowledge, T-CBT has never been directly compared to face-to-face CBT to treat depression in primary care patients with problematic alcohol use.

A recently published study of T-CBT versus face-to-face CBT for depression in 325 primary care patients with major depressive disorder (Mohr et al. 2012), which included 103 patients with problematic alcohol use, can help add to the literature of non face-to-face methods of CBT delivery for primary care patients with problematic substance use. The aim of this secondary analysis was to compare adherence rates of T-CBT vs. face-to-face CBT and depression outcomes in depressed primary care patients with problematic alcohol use. The T-CBT and face-to-face CBT interventions were delivered by clinical PhD-level

psychologists in a primary care setting. We decided to focus on patients with depression and problematic alcohol use for this analysis, since depression and co-occurring problematic alcohol use are common (Crum et al. 2001). For example, some reports show that 15%–25% of patients with depression have co-occurring problematic alcohol use (Kessler et al. 1996; Matsumoto et al. 2011).

Though the sample size for this secondary analysis is smaller than the primary analysis, we are able to report outcomes at the end of treatment (week 18), 3-month follow-up, and 6-month follow-up. We hypothesized that T-CBT participants would attend significantly more sessions than those receiving face-to-face CBT due to the feasibility and efficacy of telephone delivery. We also hypothesized that significantly fewer participants would discontinue T-CBT before session 18 compared with face-to-face CBT. Finally, to stay consistent with the primary manuscript (Mohr et al. 2012), we hypothesized that T-CBT participants would not have inferior depression outcomes compared to face-to-face CBT participants.

MATERIALS AND METHODS

Procedures and Measures

Full details of the study used for this analysis are described in the primary manuscript (Mohr et al. 2012). Briefly, participants met criteria for major depressive disorder, had a Hamilton Depression Rating Scale (Ham-D) score greater than or equal to 16, were aged 18 years or older, could speak and read English, and were able to participate in face-to-face or telephone therapy. For this analysis, “problematic alcohol use” was defined using the positive screen criteria with the Alcohol Use Disorders Identification Test (AUDIT) total score, per the National Institute on Alcohol Abuse and Alcoholism (NIAAA 2007): AUDIT score of 4 or more for men over age 60 or women, or AUDIT score of 8 or more for men age 60 or younger. All participants provided informed consent, and the study was approved by the Northwestern University institutional review board.

Participants were randomized in a 1:1 ratio to face-to-face CBT or T-CBT for depression. Full details of the CBT protocol are described in the primary manuscript (Mohr et al. 2012). Briefly, face-to-face CBT and T-CBT used the same protocol, with the treatment delivery method being the only aspect that differed between conditions. Participants received eighteen 45-minute sessions: 2 sessions weekly for the first 2 weeks, followed by 12 weekly sessions, with 2 final booster sessions the last 4 weeks. All participants received a workbook that included 8 chapters covering CBT concepts, along with 5 optional modules of common comorbidities and treatment content. Nine clinical PhD-level psychologists provided both face-to-face CBT and T-CBT. Face-to-face CBT was provided in the Preventive Medicine clinic at Northwestern University, and T-CBT was provided only on the telephone.

This analysis only included the 103 depressed participants who at least met criteria for problematic alcohol use. The AUDIT was administered at baseline and at the end of treatment (week 18). All psychiatric diagnoses were determined using the Mini-International Neuropsychiatric Interview (Sheehan et al. 1998). The four treatment adherence outcomes at the end of treatment (week 18) for this analysis were: 1) number of CBT sessions attended,

2) failure to engage in treatment [attended fewer than 5 sessions], 3) failure to complete treatment [attended more than 4 CBT sessions but less than 18 CBT sessions], and 4) discontinuation of treatment [did not attend CBT session #18]. The depression outcomes at all 3 timepoints (end of treatment [week 18], 3-month follow-up, 6-month follow-up) for this analysis were: 1) Patient Health Questionnaire-9 Score, 2) 17-item Hamilton Depression Rating Scale Score, 3) whether a participant was receiving an active dose of antidepressant medication, 4) whether a participant continued to meet criteria for major depressive disorder, 5) response criteria on the Hamilton Depression Rating Scale, defined as a 50% decrease in Ham-D score, and 6) remission criteria on the 7-item Hamilton Depression Rating Scale, defined as less than or equal to 7. The 17-item Ham-D scores are clinically described (Kearns et al. 1982) as follows: 0–7 normal, 8–13 mild depression, 14–18 moderate depression, 19–22 severe depression, ≥ 23 very severe depression.

Statistical Analysis

All analyses between both groups were conducted using IBM SPSS Statistics version 20 (Armonk, NY). Since this was an exploratory secondary analysis, P -values < 0.05 were considered significant. z -scores assessed continuous variables for extreme values (> 3.29 or < -3.29). The Kolmogorov-Smirnov and Shapiro-Wilk tests assessed normality, and the Levene's test assessed homogeneity of variance. Non-parametric tests were used to analyze continuous variables when appropriate. The chi-square and Fisher's exact tests were used to analyze categorical variables. The Wilcoxon signed-rank test was used to analyze the change in AUDIT score from baseline to end of treatment.

RESULTS

Table 1 presents baseline characteristics of the face-to-face CBT and T-CBT groups. Both groups did not significantly differ in age, sex, ethnicity, marital status, educational level, severity of depression (severe depression using the Ham-D score), antidepressant use, total score on the Alcohol Use Disorders Identification Test and substance use disorder diagnosis. One AUDIT score was an extreme value; adjusting this score made no difference in the final analysis.

Table 2 presents end of treatment (week 18) clinical and treatment adherence outcomes. Regarding the AUDIT total score and depression outcomes, the face-to-face CBT and T-CBT groups did not significantly differ on any outcomes (mild depression using the Ham-D score). Regarding treatment adherence outcomes, both groups did not significantly differ in the number of CBT sessions attended, failure to engage in treatment, failure to complete treatment and discontinuation of treatment. The decrease in AUDIT total score from baseline to end of treatment was significant in participants in each group ($P < 0.001$); this decrease in AUDIT total score was not significant between groups ($P = 0.21$).

Since there were 26 participants between the face-to-face CBT group ($n = 13$) and T-CBT group ($n = 13$) who discontinued treatment (did not attend CBT session #18), we checked if there were any significant differences between the participants who discontinued treatment and the participants who remained in treatment. A greater number of participants who remained in treatment (57.1%) than participants who discontinued treatment (30.8%) were

significantly likely to have a single marital status [$\chi^2(1) = 5.41, P = 0.02$]. A greater number of participants who discontinued treatment (61.5%) than participants who remained in treatment (36.4%) were significantly likely to meet remission criteria on the Hamilton Depression Rating Scale [$\chi^2(1) = 5.03, P = 0.03$]. Participants who remained in treatment were not significantly different on any other variable compared with participants who discontinued treatment.

Since there were 13 participants between the face-to-face CBT group ($n = 7$) and T-CBT group ($n = 6$) who did not complete the AUDIT at the end of treatment (week 18), we checked if there were any significant differences between the participants who completed the AUDIT at the end of treatment and those who did not. Participants who did not complete the AUDIT at the end of treatment (median age 33) were significantly younger than participants who completed the AUDIT at the end of treatment (median age 44.5) [$W_s = 448.0, z = 2.27, P = 0.02$]. A greater number of participants who did not complete the AUDIT at the end of treatment (92.3%) than participants who completed the AUDIT at the end of treatment (35.6%) were significantly likely to meet remission criteria on the Hamilton Depression Rating Scale [$\chi^2(1) = 15.0, P < 0.001$]. Participants who completed the AUDIT at the end of treatment were not significantly different on any other variable compared with participants who did not complete the AUDIT at the end of treatment.

Table 3 presents post-study depression outcomes. At 3-month follow-up, the face-to-face CBT and T-CBT groups did not significantly differ on any depression outcomes (mild depression using the Ham-D score). One PHQ-9 score was an extreme value; adjusting this score made no difference in the final analysis. Similarly, at 6-month follow-up, the face-to-face CBT and T-CBT groups did not significantly differ on any depression outcomes (mild depression using the Ham-D score).

DISCUSSION

This secondary analysis of a larger study compared treatment adherence rates of T-CBT vs. face-to-face CBT and depression outcomes in depressed primary care patients with problematic alcohol use. The T-CBT and face-to-face CBT groups were similar on all treatment adherence and depression outcomes in this sample of depressed primary care patients with problematic alcohol use. Using the 17-item Ham-D score, depression decreased from the severe range at baseline to the mild range at the end of treatment and at 3-month and 6-month follow-up. The discontinuation, failure to engage in and failure to complete treatment outcomes and the mean and median numbers of CBT sessions attended were similar, suggesting that both types of CBT delivery in the primary care setting are feasible for depressed patients with problematic alcohol use.

Some of the findings in this analysis are different from the findings of the overall analysis (Mohr et al. 2012), where number of CBT sessions attended, failure to engage in treatment, and discontinuation of treatment were significantly different between groups. Perhaps those with depression and co-occurring problematic substance use disorder had a poorer quality of life – something which is found in dual diagnosis populations (Benaiges, Prat & Adan 2012; Bizzarri et al. 2005; Singh et al. 2005). This may have led such participants to stay in

treatment longer for their depression or equally dropout – *regardless* of the method of CBT delivery. However, this is speculative, as quality of life using a scale specific to substance abuse populations (eg, Drug User Quality of Life Scale (Brogly et al. 2003; Hubley & Palepu 2007; Hubley, Russell & Palepu 2005)) was not included in the primary study.

The finding in this analysis of the 17-item Ham-D score decreasing from the severe range at baseline to the mild range at the end of treatment is similar to the overall analysis (Mohr et al. 2012). The Ham-D score remained in the moderate range for the T-CBT group in the overall analysis at 3-month and 6-month follow-up (Mohr et al. 2012), whereas the Ham-D score decreased to the mild range for the T-CBT group in this analysis at 3-month and 6-month follow-up. This may have been related to the beginning pattern of decrease in alcohol consumption in the study based on the decrease in AUDIT total score from baseline to end of treatment. However, the AUDIT was not administered at 3-month or 6-month follow-up in order to further speculate on this finding.

An interesting finding is the significant decrease in AUDIT total score from baseline to end of treatment in both groups (Table 2), as substance use was not a focus of the CBT in either group. One possible explanation for this finding is that participants may have been “self-medicating” their depression with alcohol (Bolton, Robinson & Sareen 2009; Miller et al. 2002), and improving the depression with either face-to-face CBT or T-CBT resulted in a decrease in problematic alcohol use from not needing to self-medicate their depression as much. Since the decrease in AUDIT total score between both groups was not significant, this finding also suggests that either delivery method of CBT for depression can help decrease co-occurring problematic alcohol use.

Regarding the significant differences between the participants who discontinued treatment and the participants who remained in treatment, and between the participants who completed the AUDIT at the end of treatment and the participants who did not complete the AUDIT at the end of treatment, these findings may be related to a limited number of participants who discontinued treatment compared to those who remained in treatment. These significant differences need further exploration with larger sample sizes.

With a sample size of 103, these data suggest there may be no true differences between T-CBT and face-to-face CBT for this population. Primary care clinicians may consider using T-CBT when treating depression in patients with co-occurring problematic alcohol use who might have difficulties in accessing care (eg, patients who are living in urban areas with time-consuming travel arrangements or who are living in rural areas) and find similar efficacy as face-to-face CBT. Depression did decrease from the severe range at baseline to the mild range at the end of treatment and at 3-month and 6-month follow-up.

The clinical PhD-level psychologists who actually delivered either form of CBT were physically located in a primary care setting. Since it is unlikely that primary care providers themselves will deliver 18 sessions of either form of CBT due to time constraints of a busy primary care practice (Baron 2010; Kaner, Haighton & McAvoy 1998; Moayyeri et al. 2011), these data also call for increasing the physical presence of PhD-level psychologists in

primary care settings to help primary care providers successfully treat depressed patients with problematic alcohol use.

This analysis has several strengths. First, this analysis is the 1st report to directly compare T-CBT with face-to-face CBT for depression in primary care patients with problematic alcohol use. Second, patients in a broader primary care setting were selected, instead of patients in a narrower addiction treatment setting. Third, we are able to report depression outcomes at three timepoints (end of treatment [week 18], 3-month follow-up, 6-month follow-up), instead of only one end of treatment outcome. Finally, four different treatment adherence outcomes and six different depression outcomes were analyzed, instead of just one treatment adherence outcome or one depression outcome.

This analysis has several limitations. First, the primary study was not specifically designed to assess the aim of this *post-hoc* analysis, which was focused on methods of CBT delivery for depressed primary care patients with problematic alcohol use. Second, substance use behaviors were not the focus of either CBT intervention, which might lead to different treatment adherence outcomes. Third, concomitant medication history was not collected when the primary study was initially conducted. Such medication history could have more fully characterized the sample in this analysis. Fourth, we included participants who at least met criteria for problematic alcohol use in this analysis, which meant that participants with more severe substance use disorders were also included (see Table 1). We had insufficient statistical power to either analyze those with only a substance use disorder, or to exclude all participants with a substance use disorder. To preserve sufficient statistical power, we used a broader criterion of at least minimum problematic alcohol use in this analysis. Finally, alcohol/substance use was not more thoroughly assessed, such as quantification of alcohol/substance use or presence of nicotine dependence, which can help evaluate the impact of substance use itself on treatment adherence outcomes.

In conclusion, in this preliminary secondary analysis, T-CBT for depression may have similar treatment adherence and depression outcomes as face-to-face CBT for depression in primary care patients with problematic alcohol use. Primary care clinicians may consider either type of CBT delivery when treating such patients. For patients with problematic alcohol use who have barriers to accessing care, such as those living in urban areas with time-consuming travel arrangements or those living in rural areas, T-CBT may represent a reasonable option for depression that might provide similar efficacy as face-to-face CBT. Future larger clinical trials directly comparing T-CBT to face-to-face CBT can help definitively determine whether CBT delivery via telephone is similar in efficacy to face-to-face in depressed patients with problematic alcohol use who are treated in the primary care setting. Closer assessment of substance use behaviors will also be essential in such future clinical trials.

Acknowledgments

FUNDING

This study was funded by research grant NIMH R01-MH059708 (Northwestern University, Chicago, IL) to Dr. Mohr (Principal Investigator). Dr. Kalapatapu is currently funded by K23DA034883.

References

- Alam DA, Martorana A. Addiction treatment: level of care determination. *Prim Care*. 2011; 38(1): 125–36. vii. [PubMed: 21356425]
- Anderson RL, Gittler J. Unmet need for community-based mental health and substance use treatment among rural adolescents. *Community Ment Health J*. 2005; 41(1):35–49. [PubMed: 15932051]
- Babor TF, McRee BG, Kassebaum PA, Grimaldi PL, Ahmed K, Bray J. Screening, Brief Intervention, and Referral to Treatment (SBIRT): toward a public health approach to the management of substance abuse. *Subst Abus*. 2007; 28(3):7–30. [PubMed: 18077300]
- Baron RJ. What's keeping us so busy in primary care? A snapshot from one practice. *N Engl J Med*. 2010; 362(17):1632–6. [PubMed: 20427812]
- Benaiges I, Prat G, Adan A. Health-related quality of life in patients with dual diagnosis: clinical correlates. *Health Qual Life Outcomes*. 2012; 10(1):106. [PubMed: 22950596]
- Bischof G, Grothues JM, Reinhardt S, Meyer C, John U, Rumpf HJ. Evaluation of a telephone-based stepped care intervention for alcohol-related disorders: a randomized controlled trial. *Drug Alcohol Depend*. 2008; 93(3):244–51. [PubMed: 18054443]
- Bizzarri J, Rucci P, Vallotta A, Girelli M, Scandolari A, Zerbetto E, Sbrana A, Iagher C, Dellantonio E. Dual diagnosis and quality of life in patients in treatment for opioid dependence. *Subst Use Misuse*. 2005; 40(12):1765–76. [PubMed: 16419555]
- Bolton JM, Robinson J, Sareen J. Self-medication of mood disorders with alcohol and drugs in the National Epidemiologic Survey on Alcohol and Related Conditions. *J Affect Disord*. 2009; 115(3): 367–75. [PubMed: 19004504]
- Borders TF, Booth BM. Research on rural residence and access to drug abuse services: where are we and where do we go? *J Rural Health*. 2007; 23(Suppl):79–83. [PubMed: 18237329]
- Brogly S, Mercier C, Bruneau J, Palepu A, Franco E. Towards more effective public health programming for injection drug users: development and evaluation of the injection drug user quality of life scale. *Subst Use Misuse*. 2003; 38(7):965–92. [PubMed: 12801151]
- Brown RL, Saunders LA, Bobula JA, Mundt MP, Koch PE. Randomized-controlled trial of a telephone and mail intervention for alcohol use disorders: three-month drinking outcomes. *Alcohol Clin Exp Res*. 2007; 31(8):1372–9. [PubMed: 17550366]
- Cacciola JS, Camilleri AC, Carise D, Rikoon SH, McKay JR, McLellan AT, Wilson C, Schwarzlose JT. Extending residential care through telephone counseling: initial results from the Betty Ford Center Focused Continuing Care protocol. *Addict Behav*. 2008; 33(9):1208–16. [PubMed: 18539402]
- Carter RE, Haynes LF, Back SE, Herrin AE, Brady KT, Leimberger JD, Sonne SC, Hubbard RL, Liepman MR. Improving the transition from residential to outpatient addiction treatment: gender differences in response to supportive telephone calls. *Am J Drug Alcohol Abuse*. 2008; 34(1):47–59. [PubMed: 18161643]
- Chong J, Herman-Stahl M. Substance abuse treatment outcomes among American Indians in the Telephone Aftercare Project. *J Psychoactive Drugs*. 2003; 35(1):71–7. [PubMed: 12733761]
- Crum RM, Brown C, Liang KY, Eaton WW. The association of depression and problem drinking: analyses from the Baltimore ECA follow-up study. *Epidemiologic Catchment Area*. *Addict Behav*. 2001; 26(5):765–73. [PubMed: 11676386]
- Currie SR, Clark S, Hodgins DC, El-Guebaly N. Randomized controlled trial of brief cognitive-behavioural interventions for insomnia in recovering alcoholics. *Addiction*. 2004; 99(9):1121–32. [PubMed: 15317632]
- Funderburk JS, Sugarman DE, Labbe AK, Rodrigues A, Maisto SA, Nelson B. Behavioral health interventions being implemented in a VA primary care system. *J Clin Psychol Med Settings*. 2011; 18(1):22–9. [PubMed: 21350951]
- Gamm LD. Mental health and substance abuse services among rural minorities. *J Rural Health*. 2004; 20(3):206–9. [PubMed: 15298094]
- Garcia Campayo J, Sobradie N, Alda M, Mas A, Andres E, Magallon R, Crucelaegui A, Sanz B. Effectiveness of topiramate for tobacco dependence in patients with depression; a randomised, controlled trial. *BMC Fam Pract*. 2008; 9:28. [PubMed: 18462502]

- Godley MD, Coleman-Cowger VH, Titus JC, Funk RR, Orndorff MG. A randomized controlled trial of telephone continuing care. *J Subst Abuse Treat*. 2010; 38(1):74–82. [PubMed: 19729266]
- Gordon AJ, Fiellin DA, Friedmann PD, Gourevitch MN, Kraemer KL, Arnsten JH, Saitz R. Society of General Internal Medicine's Substance Abuse Interest G. Update in addiction medicine for the primary care clinician. *J Gen Intern Med*. 2008; 23(12):2112–6. [PubMed: 18830761]
- Hall JA, Huber DL. Telephone management in substance abuse treatment. *Telemed J E Health*. 2000; 6(4):401–7. [PubMed: 11242548]
- Hornig FF, Chueh KH. Effectiveness of telephone follow-up and counseling in aftercare for alcoholism. *J Nurs Res*. 2004; 12(1):11–20. [PubMed: 15136959]
- Hubbard RL, Leimberger JD, Haynes L, Patkar AA, Holter J, Liepman MR, Lucas K, Tyson B, Day T, Thorpe EA, Faulkner B, Hasson A. National Institute on Drug A. Telephone enhancement of long-term engagement (TELE) in continuing care for substance abuse treatment: a NIDA clinical trials network (CTN) study. *Am J Addict*. 2007; 16(6):495–502. [PubMed: 18058417]
- Hubley AM, Palepu A. Injection Drug User Quality of Life Scale (IDUQOL): findings from a content validation study. *Health Qual Life Outcomes*. 2007; 5:46. [PubMed: 17663783]
- Hubley AM, Russell LB, Palepu A. Injection Drug Use Quality of Life scale (IDUQOL): a validation study. *Health Qual Life Outcomes*. 2005; 3:43. [PubMed: 16029504]
- Jackson A, Shannon L. Barriers to receiving substance abuse treatment among rural pregnant women in Kentucky. *Matern Child Health J*. 2012; 16(9):1762–70. [PubMed: 22139045]
- Johnson M, Jackson R, Guillaume L, Meier P, Goyder E. Barriers and facilitators to implementing screening and brief intervention for alcohol misuse: a systematic review of qualitative evidence. *J Public Health (Oxf)*. 2011; 33(3):412–21. [PubMed: 21169370]
- Kaner EF, Haighton CA, McAvoy BR. 'So much post, so busy with practice--so, no time!': a telephone survey of general practitioners' reasons for not participating in postal questionnaire surveys. *Br J Gen Pract*. 1998; 48(428):1067–9. [PubMed: 9624749]
- Karno M, Farabee D, Brecht ML, Rawson R. Patient reactance moderates the effect of directive telephone counseling for methamphetamine users. *J Stud Alcohol Drugs*. 2012; 73(5):844–50. [PubMed: 22846250]
- Kay-Lambkin FJ, Baker AL, Kelly B, Lewin TJ. Clinician-assisted computerised versus therapist-delivered treatment for depressive and addictive disorders: a randomised controlled trial. *Med J Aust*. 2011; 195(3):S44–50. [PubMed: 21806518]
- Kay-Lambkin FJ, Baker AL, Lewin TJ, Carr VJ. Computer-based psychological treatment for comorbid depression and problematic alcohol and/or cannabis use: a randomized controlled trial of clinical efficacy. *Addiction*. 2009; 104(3):378–88. [PubMed: 19207345]
- Kearns NP, Cruickshank CA, McGuigan KJ, Riley SA, Shaw SP, Snaith RP. A comparison of depression rating scales. *Br J Psychiatry*. 1982; 141:45–9. [PubMed: 7116071]
- Kessler RC, Nelson CB, McGonagle KA, Liu J, Swartz M, Blazer DG. Comorbidity of DSM-III-R major depressive disorder in the general population: results from the US National Comorbidity Survey. *Br J Psychiatry Suppl*. 1996; (30):17–30. [PubMed: 8864145]
- Killen JD, Fortmann SP, Schatzberg AF, Arredondo C, Murphy G, Hayward C, Celio M, Crompton D, Fong D, Pandurangi M. Extended cognitive behavior therapy for cigarette smoking cessation. *Addiction*. 2008; 103(8):1381–90. [PubMed: 18855829]
- Matsumoto T, Azekawa T, Uchikado H, Ozaki S, Hasegawa N, Takekawa Y, Matsushita S. Comparative study of suicide risk in depressive disorder patients with and without problem drinking. *Psychiatry Clin Neurosci*. 2011; 65(5):529–32. [PubMed: 21851463]
- Mbilinyi LF, Neighbors C, Walker DD, Roffman RA, Zegree J, Edleson J, O'Rourke A. A Telephone Intervention for Substance-Using Adult Male Perpetrators of Intimate Partner Violence. *Res Soc Work Pract*. 2011; 21(1):43–56. [PubMed: 22754270]
- McKay JR, Van Horn D, Oslin DW, Ivey M, Drapkin ML, Coviello DM, Yu Q, Lynch KG. Extended telephone-based continuing care for alcohol dependence: 24-month outcomes and subgroup analyses. *Addiction*. 2011; 106(10):1760–9. [PubMed: 21545667]
- McKay JR, Van Horn DH, Oslin DW, Lynch KG, Ivey M, Ward K, Drapkin ML, Becher JR, Coviello DM. A randomized trial of extended telephone-based continuing care for alcohol dependence:

- within-treatment substance use outcomes. *J Consult Clin Psychol*. 2010; 78(6):912–23. [PubMed: 20873894]
- McKinstry B, Hammersley V, Burton C, Pinnock H, Elton R, Dowell J, Sawdon N, Heaney D, Elwyn G, Sheikh A. The quality, safety and content of telephone and face-to-face consultations: a comparative study. *Qual Saf Health Care*. 2010; 19(4):298–303. [PubMed: 20430933]
- Miller BE, Miller MN, Verhegge R, Linville HH, Pumariega AJ. Alcohol misuse among college athletes: self-medication for psychiatric symptoms? *J Drug Educ*. 2002; 32(1):41–52. [PubMed: 12096556]
- Miller WR, Baca C, Compton WM, Ernst D, Manuel JK, Pringle B, Schermer CR, Weiss RD, Willenbring ML, Zweben A. Addressing substance abuse in health care settings. *Alcohol Clin Exp Res*. 2006; 30(2):292–302. [PubMed: 16441278]
- Moayeri A, Soltani A, Moosapour H, Raza M. Evidence-based history taking under “time constraint”. *J Res Med Sci*. 2011; 16(4):559–64. [PubMed: 22091274]
- Mohr DC, Ho J, Duffecy J, Reifler D, Sokol L, Burns MN, Jin L, Siddique J. Effect of telephone-administered vs face-to-face cognitive behavioral therapy on adherence to therapy and depression outcomes among primary care patients: a randomized trial. *JAMA*. 2012; 307(21):2278–85. [PubMed: 22706833]
- Mulleady G. Pilot testing of telephone conferencing to help reduce tranquilizer dependence. *Addiction*. 2001; 96(11):1679–80. [PubMed: 11791511]
- NIAAA. A Clinician’s Guide. Rockville, MD: NIH; 2007. Helping Patients Who Drink Too Much. Publication #07-3769
- O’Malley SS, Rounsaville BJ, Farren C, Namkoong K, Wu R, Robinson J, O’Connor PG. Initial and maintenance naltrexone treatment for alcohol dependence using primary care vs specialty care: a nested sequence of 3 randomized trials. *Arch Intern Med*. 2003; 163(14):1695–704. [PubMed: 12885685]
- Oslin DW, Sayers S, Ross J, Kane V, Ten Have T, Conigliaro J, Cornelius J. Disease management for depression and at-risk drinking via telephone in an older population of veterans. *Psychosom Med*. 2003; 65(6):931–7. [PubMed: 14645769]
- Ouimette P, Jemelka R, Hall J, Brimmer K, Krupski A, Stark K. Services to patients with dual diagnoses: findings from Washington’s mental health service system. *Subst Use Misuse*. 2007; 42(1):113–27. [PubMed: 17366128]
- Parker JD, Turk CL, Busby LD. A brief telephone intervention targeting treatment engagement from a substance abuse program wait list. *J Behav Health Serv Res*. 2002; 29(3):288–303. [PubMed: 12216373]
- Pilowsky DJ, Wu LT. Screening for alcohol and drug use disorders among adults in primary care: a review. *Subst Abuse Rehabil*. 2012; 3(1):25–34. [PubMed: 22553426]
- Pridemore WA, Damphousse KR, Moore RK. Obtaining sensitive information from a wary population: a comparison of telephone and face-to-face surveys of welfare recipients in the United States. *Soc Sci Med*. 2005; 61(5):976–84. [PubMed: 15955399]
- Rus-Makovec M, Cebasek-Travnik Z. Long-term abstinence and well-being of alcohol-dependent patients after intensive treatment and aftercare telephone contacts. *Croat Med J*. 2008; 49(6):763–71. [PubMed: 19090601]
- Sexton RL, Carlson RG, Leukefeld CG, Booth BM. Barriers to formal drug abuse treatment in the rural south: a preliminary ethnographic assessment. *J Psychoactive Drugs*. 2008; 40(2):121–9. [PubMed: 18720660]
- Sheehan DV, Lecrubier Y, Sheehan KH, Amorim P, Janavs J, Weiller E, Hergueta T, Baker R, Dunbar GC. The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. *J Clin Psychiatry*. 1998; 59(Suppl 20):22–33. quiz 34–57. [PubMed: 9881538]
- Singh J, Mattoo SK, Sharan P, Basu D. Quality of life and its correlates in patients with dual diagnosis of bipolar affective disorder and substance dependence. *Bipolar Disord*. 2005; 7(2):187–91. [PubMed: 15762860]
- Stotts AL, Diclemente CC, Dolan-Mullen P. One-to-one: a motivational intervention for resistant pregnant smokers. *Addict Behav*. 2002; 27(2):275–92. [PubMed: 11817768]

- Tait RJ, Hulse GK, Waterreus A, Flicker L, Lautenschlager NT, Jamrozik K, Almeida OP. Effectiveness of a smoking cessation intervention in older adults. *Addiction*. 2007; 102(1):148–55. [PubMed: 17207132]
- Turner BJ. Gaps in addressing problem drinking: overcoming primary care and alcohol treatment deficiencies. *Curr Psychiatry Rep*. 2009; 11(5):345–52. [PubMed: 19785974]
- Van Hook S, Harris SK, Brooks T, Carey P, Kossack R, Kulig J, Knight JR. New England Partnership for Substance Abuse R. The “Six T’s”: barriers to screening teens for substance abuse in primary care. *J Adolesc Health*. 2007; 40(5):456–61. [PubMed: 17448404]
- Wittchen HU, Hoch E, Klotsche J, Muehlig S. Smoking cessation in primary care - a randomized controlled trial of bupropione, nicotine replacements, CBT and a minimal intervention. *Int J Methods Psychiatr Res*. 2011; 20(1):28–39. [PubMed: 21574208]
- Wood SA. Health care services for HIV-positive substance abusers in a rural setting: an innovative program. *Soc Work Health Care*. 2008; 47(2):108–21. [PubMed: 18956503]
- Zanjani F, Bush H, Oslin D. Telephone-based psychiatric referral-care management intervention health outcomes. *Telemed J E Health*. 2010; 16(5):543–50. [PubMed: 20575721]
- Zanjani F, Mavandadi S, TenHave T, Katz I, Durai NB, Krahn D, Llorente M, Kirchner J, Olsen E, Van Stone W, Cooley S, Oslin DW. Longitudinal course of substance treatment benefits in older male veteran at-risk drinkers. *J Gerontol A Biol Sci Med Sci*. 2008; 63(1):98–106. [PubMed: 18245767]

Table 1

Baseline Characteristics of Participants with Problematic Alcohol Use.

	Face-to-Face CBT n = 53	T-CBT n = 50	Significance between Groups
	Mean (S.D.) or %		
Age	41.9 (13.9) [Median 39]	45.6 (13.7) [Median 43.5]	$W_S = 2.815.5, z = 1.42, P = 0.16^d$
Female	88.7%	86.0%	$\chi^2(1) = 0.17, P = 0.68$
Caucasian	67.9%	60.0%	$\chi^2(1) = 0.70, P = 0.40$
Single	45.3%	56.0%	$\chi^2(1) = 1.18, P = 0.28$
Bachelor's degree or higher	71.7%	72.0%	$\chi^2(1) = 0.001, P = 0.97$
Patient Health Questionnaire-9 Score	16.0 (5.1) [Median 16]	16.8 (5.1) [Median 17] ^b	$W_S = 2.655.0, z = 0.88, P = 0.38$
17-item Hamilton Depression Rating Scale Score	21.8 (3.8) [Median 22]	22.2 (4.7) [Median 22]	$W_S = 2.607.0, z = 0.05, P = 0.96$
Receiving active dose of antidepressant medication	34.0%	40.0%	$\chi^2(1) = 0.40, P = 0.53$
Alcohol Use Disorders Identification Test – total score	8.9 (5.6) [Median 7]	8.7 (4.7) [Median 7.5]	$W_S = 2.658.0, z = 0.39, P = 0.70$
Concurrent diagnosis of alcohol abuse or dependence	34.0%	30.0%	$\chi^2(1) = 0.19, P = 0.67$
Concurrent diagnosis of drug ^c abuse or dependence	5.7%	10.0%	$P = 0.48^d$

^a: Wilcoxon rank-sum test and z statistic

^b: All results for this cell are based on $n = 49$ due to one missing data point.

^c: Drugs included cannabis, stimulants and opiates. Drug groups were combined to help increase the power for the statistical test.

^d: Fisher's exact test, 2-sided

Table 2
End of Treatment (Week 18) Clinical and Treatment Adherence Outcomes of Participants with Problematic Alcohol Use.

	Face-to-Face CBT	T-CBT	Significance between Groups
	Mean (S.D.) or % ^a		
Alcohol Use Disorders Identification Test – total score	4.5 (2.2) [Median 4] (n = 46)	4.3 (2.1) [Median 5] (n = 44)	$W_3 = 1,971.5, z = 0.25, P = 0.80^b$
Patient Health Questionnaire-9 Score	5.9 (5.4) [Median 5] (n = 46)	6.9 (7.2) [Median 4] (n = 45)	$W_3 = 2,074.5, z = 0.04, P = 0.97$
17-item Hamilton Depression Rating Scale Score	11.8 (7.2) [Median 10] (n = 47)	12.8 (9.2) [Median 12] (n = 45)	$W_5 = 2,104.5, z = 0.09, P = 0.93$
Receiving active dose of antidepressant medication	31.9% (n = 47)	36.4% (n = 44)	$\chi^2(1) = 0.20, P = 0.66$
Continued to meet criteria for major depressive disorder	14.9% (n = 47)	20.0% (n = 45)	$\chi^2(1) = 0.42, P = 0.52$
Response criteria on the Hamilton Depression Rating Scale	53.2% (n = 47)	48.9% (n = 45)	$\chi^2(1) = 0.17, P = 0.68$
Remission criteria on the 7-item Hamilton Depression Rating Scale	41.5% (n = 53)	44.0% (n = 50)	$\chi^2(1) = 0.07, P = 0.80$
Number of CBT sessions attended	15.0 (4.8) [Median 17] (n = 53)	14.7 (5.2) [Median 17] (n = 50)	$W_3 = 2,610.0, z = 0.07, P = 0.95$
Failure to engage in treatment	7.5% (n = 53)	8.0% (n = 50)	$P = 1.00^c$
Failure to complete treatment ^d	18.4% (n = 49)	19.6% (n = 46)	$\chi^2(1) = 0.02, P = 0.88$
Discontinuation of treatment ^e	24.5% (n = 53)	26.0% (n = 50)	$\chi^2(1) = 0.03, P = 0.86$
Decrease in Alcohol Use Disorders Identification Test total score from baseline to end of treatment	$T = 31.0^f, z = 4.85, P < 0.001, (n = 46)$	$T = 23.5^f, z = 5.20, P < 0.001, (n = 44)$	$W_5 = 2,158.0, z = 1.26, P = 0.21^b$

^a : Sample sizes in some cells vary due to missing data points.

^b : Wilcoxon rank-sum test and z statistic

^c : Fisher's exact test, 2-sided

^d : Attended more than 4 CBT sessions but less than 18 CBT sessions

^e : Did not attend CBT session #18

^f : Wilcoxon signed-rank test and z statistic

Table 3

Post-Study Depression Outcomes of Participants with Problematic Alcohol Use.

		Face-to-Face CBT		T-CBT	Significance between Groups
		Mean (S.D.) or % ^a			
At 3 months	Patient Health Questionnaire-9 Score	5.0 (5.4) [Median 3] (<i>n</i> = 46)	7.4 (7.0) [Median 4.5] (<i>n</i> = 44)		$W_5 = 2,202.5, z = 1.63, P = 0.104$
	17-item Hamilton Depression Rating Scale Score	10.4 (6.0) [Median 10] (<i>n</i> = 47)	13.4 (8.3) [Median 11] (<i>n</i> = 44)		$W_5 = 2,221.5, z = 1.57, P = 0.12$
	Receiving active dose of antidepressant medication	37.5% (<i>n</i> = 48)	38.6% (<i>n</i> = 44)		$\chi^2(1) = 0.01, P = 0.91$
	Continued to meet criteria for major depressive disorder	8.3% (<i>n</i> = 48)	20.9% (<i>n</i> = 43)		$\chi^2(1) = 2.94, P = 0.09$
	Response criteria on the Hamilton Depression Rating Scale	61.7% (<i>n</i> = 47)	43.2% (<i>n</i> = 44)		$\chi^2(1) = 3.13, P = 0.08$
	Remission criteria on the 7-item Hamilton Depression Rating Scale	43.4% (<i>n</i> = 53)	34.0% (<i>n</i> = 50)		$\chi^2(1) = 0.96, P = 0.33$
At 6 months	Patient Health Questionnaire-9 Score	5.7 (6.0) [Median 4] (<i>n</i> = 42)	7.9 (7.6) [Median 6] (<i>n</i> = 42)		$W_5 = 1,930.5, z = 1.31, P = 0.19$
	17-item Hamilton Depression Rating Scale Score	10.4 (6.0) [Median 9.5] (<i>n</i> = 46)	13.5 (8.7) [Median 12.5] (<i>n</i> = 42)		$W_5 = 2,039.5, z = 1.43, P = 0.15$
	Receiving active dose of antidepressant medication	35.6% (<i>n</i> = 45)	40.5% (<i>n</i> = 42)		$\chi^2(1) = 0.22, P = 0.64$
	Continued to meet criteria for major depressive disorder	13.0% (<i>n</i> = 46)	17.1% (<i>n</i> = 41)		$\chi^2(1) = 0.28, P = 0.60$
	Response criteria on the Hamilton Depression Rating Scale	54.3% (<i>n</i> = 46)	42.9% (<i>n</i> = 42)		$\chi^2(1) = 1.16, P = 0.28$
	Remission criteria on the 7-item Hamilton Depression Rating Scale	45.3% (<i>n</i> = 53)	40.0% (<i>n</i> = 50)		$\chi^2(1) = 0.29, P = 0.59$

^a: Sample sizes in some cells vary due to missing data points.

^b: Wilcoxon rank-sum test and *z* statistic