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Do Outcomes After Behavioral Couples Therapy Differ Based on the Gender of the Alcohol Use Disorder Patient?

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Abstract

Objective—This naturalistic study (conducted from 1992–1998) of Behavioral Couples Therapy (BCT) compared female and male alcohol use disorder (AUD) patients on improvement and on drinking and relationship outcomes after BCT. We also evaluated gender differences on presenting clinical problems and extent of BCT participation.

Method—Participants were 103 female and 303 male AUD patients (98.5% alcohol dependence, 1.5% alcohol abuse) and their heterosexual partners, mostly White in their forties. Couples received 20–22 BCT sessions over 5–6 months. Drinking outcomes were percentage days abstinent (PDA) and alcohol-related problems. Relationship outcome was Dyadic Adjustment Scale. Outcome data were examined at baseline, post-treatment, and 6- and 12-month follow-up. Presenting problems were demographics, alcohol problem severity, illicit drug use, emotional distress, and relationship adjustment. BCT participation was BCT attendance and BCT-targeted behaviors.

Results—We found few differences between female and male patients, who did not differ on improvement and outcomes after BCT. Both females and males showed significant large effect size improvements through 12-month follow-up on PDA and alcohol-related problems, and significant small to medium effect size improvements on relationship adjustment. Both females and males had high levels of BCT participation. Gender differences in presenting clinical problems (females being lower on age, years problem drinking, and baseline PDA, and higher on emotional distress) did not translate into gender differences in response to BCT.

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Author Disclosure

Contributors

Author 1 designed and oversaw conduct of the study. Authors 1 and 2 wrote the manuscript. Author 3 and 4 conducted the statistical analyses and provided data management expertise to the study. All authors contributed to and have approved the final manuscript.

Conflict of Interest

All authors declare there are no conflicts of interest.

Conclusion—Results showed no support for the suggestion that BCT might lead to greater improvement and better outcomes for female than male AUD patients on drinking or on relationship outcomes.

Keywords

alcohol use disorder; couples therapy; gender differences; treatment outcome

1. Introduction

Behavioral couples therapy (BCT) is a couple-based therapy for adults with alcohol use disorder (AUD) that aims to help the AUD patient and their partner build support for the patient's abstinence and improve relationship functioning. BCT has a strong research base establishing its efficacy, and it has been shown to be more effective than more typical individual-based treatment (IBT) for married or cohabiting AUD patients. Specifically, BCT produces better outcomes than IBT, consisting of greater abstinence, fewer substance-related problems, and better relationship functioning (for a review see Meis et al., 2013). However, the vast majority of the studies examining BCT have been conducted using couples where the male partner has an AUD and the female partner does not have any substance use disorder.

Three randomized controlled trials have evaluated the efficacy of BCT with female AUD patients (Fals-Stewart, Birchler & Kelly, 2006; McCrady, Epstein, Cook, Jensen & Hildebrandt, 2009; Schumm, O'Farrell, Kahler, Murphy & Muchowski, 2014). These studies showed better drinking outcomes over 12-months follow-up for BCT than individual counseling, similar to results obtained with male patients. Still, to date no studies have directly compared male and female AUD patients on BCT outcomes. However, broader studies that compared male and female patients may suggest possible gender differences to examine among patients undergoing BCT.

Studies directly comparing males and females reveal some apparent gender differences among patients entering substance use treatment. Females have lower rates of treatment entry than would be expected based on population prevalence estimates (Pelissier & Jones, 2005). Also, females enter treatment at a younger age with fewer years of substance use, yet some studies show they present with greater substance-related consequences than their male counterparts (Hernandez-Avila, Rounsaville & Kranzler, 2004). Further, females have a higher prevalence of psychiatric disorders, such as depression, anxiety and PTSD (Greenfield et al., 2007).

Interestingly, many studies have found little to no difference in treatment outcome between males and females. However, when gender differences are present, results show a better treatment outcome for females (Greenfield et al., 2007). In terms of relapse, studies indicate that females have less severe and shorter relapses and seek help more quickly following a relapse (e.g., Project MATCH, 1997). A study of outpatient alcohol treatment found females had eliminated heavy drinking days at 6-month follow-up while males continued to report heavy drinking episodes (Satre, Mertens, Areal & Weisner, 2004). Sanchez-Craig, Spivak

and Davilla (1991) also found gender difference when evaluating brief alcohol treatments, with females showing greater drinking reduction across three different conditions.

The impact of interpersonal relationships on AUD may also represent an important gender difference. Relationship concerns appear to play a greater role in women's drinking and treatment seeking behaviors for AUD. Compared to males, females report less relationship satisfaction and increased likelihood of drinking in response to interpersonal stressors (Kelly, Halford & Young, 2002). Similarly, Connors, Maisto and Zywiak (1998) found women with AUD were more likely than men with AUD to attribute conflict with their partner as a primary relapse precipitant.

This greater salience of relationship factors for female patients, coupled with evidence in some studies of better treatment outcomes for female patients, suggest that BCT could lead to greater improvement and better outcomes for female than male AUD patients. The present naturalistic study of BCT compared female and male AUD patients on the extent of improvement and on drinking and relationship outcomes after BCT. Potential gender differences on presenting clinical problems and extent of participation in BCT also were evaluated.

2. Methods

Institutional review boards at Harvard Medical School and at VA Boston approved this study.¹

2.1. Participants

These were 406 AUD patients (303 males and 103 females; 98.5% alcohol dependence, 1.5% alcohol abuse) and their heterosexual spouses or cohabiting partners who were recruited from four addiction treatment programs in Massachusetts to take part in a study designed to naturalistically examine factors that predict outcome following BCT. Study criteria included (a) patient and spouse were ages 21 to 65; (b) couple was married or living together for at least 1 year; (c) patient met current alcohol abuse or dependence diagnosis according to the *Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R;* American Psychiatric Association, 1987); (d) patient's alcohol problem diagnosis was at least as serious as any co-existing current drug problem diagnosis as shown by the patient having alcohol dependence with drug dependence, drug abuse or no drug problem or alcohol abuse with drug abuse or no drug problem; (e) patient accepted abstinence from alcohol and drugs at least for the duration of the BCT program and agreed to seriously consider taking Antabuse (if medically cleared); and (f) patient agreed to forego other AUD counseling (other than self-help such as Alcoholics Anonymous) during the BCT program. Also, patients generally were excluded if their partner also met criteria for current alcohol or drug abuse or dependence. An exception to this were 20 of the 103 female AUD patients whose

¹Some data from this sample were included in earlier articles on reductions in IPV among male (O'Farrell, Murphy, Stephen, Fals-Stewart & Murphy, 2004) and female (Schumm, O'Farrell, Murphy & Fals-Stewart, 2009) AUD patients. However, the data presented in this article examining possible gender differences on demographics, treatment participation, and drinking and relationship outcomes have not appeared elsewhere. More details about study methods are in O'Farrell et al (2004) and in Schumm et al (2009).

male partners also had a current AUD problem, and both patient and partner agreed to use the BCT sessions to pursue abstinence.²

Study participants were drawn from 464 consecutive patients (347 males and 117 females) who signed informed consent from February, 1992 to June, 1998. Fifty-eight patients dropped out early before completing the baseline assessment and were not followed further. The percentage of these early dropouts did not differ by gender (44 [13%] males and 14 [12%] females). This left 406 study patients (303 males and 103 females) who began BCT and were included in the present study sample. When compared on demographics to the study sample, the early pre-assessment dropouts, on average, were significantly younger ($M = 37.7$ vs. 42.5 years respectively; $t(455) = 3.36, p = .001$) and more likely to be in a non-marital, cohabiting relationship (31% vs. 12% cohabiting respectively; $X^2(1, 464) = 14.78, p < .001$), with a trend toward being in relationships of briefer duration ($M = 9.6$ vs. 12.6 years respectively; $t(448) = 1.88, p = .06$); but they did not differ in years of education ($M = 13.1$ vs. 13.4 years respectively; $t(453) = 0.76, p = .450$). The early dropouts did not provide other information (e.g., alcohol or relationship severity) on which comparisons with the study sample could be made.

Of the 406 study cases, 199 (49%) entered the study immediately after completing inpatient AUD treatment (typically 3–10 days in length), 172 (42%) came from persons requesting outpatient AUD treatment, and the remaining 35 (9%) came from media announcements or from other referral sources.

2.2. Procedures

2.2.1. BCT treatment program—This program is described by O'Farrell (1993). It consisted of 20–22 weekly couple sessions over a 5–6 month period – 10–12 weekly 1-hour conjoint sessions with each couple followed by 10 weekly 2-hour couples group sessions. The program included a daily recovery contract to promote abstinence, instigation of positive couple activities, and training in communication skills. The recovery contract included Alcoholics Anonymous (AA) meetings and daily spouse observed Antabuse for most patients. For patients who did not take Antabuse, the recovery contract involved a daily discussion in which the patient stated their intent not to drink that day, and the spouse expressed support for the patient's efforts to stay abstinent. Ratings of videotaped BCT sessions showed therapists adhered to the BCT manual and did so in a competent manner (see O'Farrell, Murphy, Stephan, Fals-Stewart & Murphy, 2004 for more details).

2.2.2. Data collection—Demographics and alcohol problem severity measures were collected before BCT. Drinking and relationship outcome measures were collected in interviews with patients and their partners before and after the BCT program, and at 6- and 12-month follow-up.

²Another paper (Schumm, O'Farrell and Burdzovic Andreas, 2012) that also used the present sample showed that these 20 couples in which both partners had a current AUD did not differ from the rest of the sample on extent of improvement in days abstinent in the year following BCT.

2.3. Measures

2.3.1. Alcohol problem severity measures—These included: (a) Michigan Alcoholism Screening Test (MAST; Seltzer, 1971), a widely-used screening instrument for alcohol problems; (b) Alcohol Dependence Scale (ADS; Skinner & Allen, 1982), a measure of alcohol dependence symptoms; (c) the lifetime and current (past 90 days) total scores from the Drinker Inventory of Consequences (DRINC; Miller, Tonigan, & Longabaugh, 1995), a measure of negative consequences due to alcohol misuse; (d) age of alcohol problem onset; (e) and years with a drinking problem.

2.3.2. Substance problem diagnoses—We used the substance abuse sections of the Structured Clinical Interview for DSM-III-R (SCID; Spitzer, Williams, & Gibbon, 1986) to establish diagnoses of alcohol abuse, alcohol dependence, and other drug abuse or dependence. We did not administer other sections of the SCID. Two senior researchers with extensive SCID experience trained interviewers and established inter-rater agreement of the SCID interviews; see O'Farrell et al (2004) for more details.

2.3.3. Illicit drug use—The Timeline Followback Interview (TLFB; Sobell & Sobell, 1996) measured the percentage of patients that used each of the following drugs at least once in the 12 months before BCT: cannabis, cocaine, sedatives, opioids, stimulants, PCP, hallucinogens, and inhalants.

2.3.4. Emotional distress symptoms—The measure used was the Global Symptom Index score from the Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1983). We used this symptom-based measure rather than a full-scale diagnostic evaluation of psychopathology to reduce subject burden.

2.3.5. BCT treatment participation—Number of BCT sessions attended came from an attendance log. Use of Antabuse and AA came from the TLFB interview.

2.3.6. Drinking outcomes—Percentage days abstinent (PDA) was the percentage of days on which the individual was not in hospital or jail for alcohol-related reasons and remained abstinent from alcohol and other drugs. PDA was calculated from the TLFB for the 12 months before BCT, the pre- to post-treatment interval, and months 1–6 and 7–12 after BCT. PDA was chosen because it was the primary substance use outcome measure in prior studies of BCT with AUD patients, and it reflects the abstinence orientation of the BCT methods and performance sites of the present study. Alcohol-related problems were measured before and after BCT and at 6- and 12-months follow-up with the DRINC (Miller et al., 1995) score for the past 90 days.

2.3.7. Relationship adjustment—The Dyadic Adjustment Scale (DAS; Spanier, 2001) measured couple relationship adjustment before and after BCT and at 6- and 12-months follow-up. The DAS total score for each couple was the average of the patient and partner scores at each time period. A DAS score of 97 or less was considered to show clinically significant relationship problems.

2.4. Analyses

We ran 3 analyses to find out if clinical problems before BCT and improvement and outcomes after BCT differed for female and male patients. First, the 303 male and 103 female patients were compared on baseline demographic and clinical variables using independent sample t-tests for continuous and chi-square for categorical variables. Second, to find out if female and male patients showed significant improvement, paired sample t-tests compared baseline with follow-up scores for each outcome variable. Effect size correlations (Cohen, 1988) compared the magnitude of improvements observed. Third, to find out if drinking and relationship outcomes after BCT differed for female and male patients, a Gender by Time (post, 6-, 12-month follow-up) generalized estimating equation (GEE) model was run for each outcome variable. Age, years problem drinking, emotional distress and baseline PDA, on which male and female patients differed at baseline, served as covariates in each GEE model that was conducted. GEE has several advantages, including the ability to include cases with covariate-dependent missing data on the study outcome variables, the ability to manage variable non-independence, and the ability to directly include time as a predictor (Hall et al., 2001).

Missing data for the 2nd and 3rd sets of study analyses were handled first by substituting the other partner's report (when available) for the missing value. Specifically, PDA and DRINC scores were based on the patient's self-report; when the patient's report was not available, the partner's collateral report about the patient was used. The DAS total score for each couple was the average of the patient and partner scores at each time period; if only one person's score was available, that score was used. Table 2 provides the sample size with data available at each time period. Those with one or more data points on the outcome variable were included in the GEE models (see Table 3).

3. Results

3.1. Characteristics of Female and Male AUD Patients Before BCT

3.1.1. Demographic characteristics—The sample was mostly White and married, and averaged 13 years of education, 12 years married or cohabiting, and \$55–60,000³ annual family income. As seen in Table 1, female and male patients did not differ on demographics except for age, on which female patients were significantly younger than male patients.

3.1.2. Alcohol problem severity—Both female and male patients reported serious alcohol problems, as indicated by elevated scores on the MAST, ADS, and DRINC, and by an average onset at age 27. Nearly all patients (99% of females, 98% of males) had alcohol dependence on the SCID, with the remainder having alcohol abuse. Nearly 20% had a comorbid drug problem (18% of females, 19% of males). As seen in Table 1, female and male patients did not differ on alcohol problem severity characteristics except that female

³Family income reported consisted of the income of the male and female member of the couple combined in 1998 dollars. Based on a 2-year moving average (1997–1998), the median household income in Massachusetts at this time was estimated at \$42,511 (in 1998 dollars), so the participants in this study had, on average, annual family incomes that exceeded the median household income for the state. Their average was about 35% higher than the state median. Source of this information was U.S. Census Bureau, Current Population Survey (March 1997, 1998, and 1999).

patients had significantly more days abstinent in the year before BCT and significantly fewer years of problem drinking.

3.1.3. Illicit drug use—Two-fifths (40.9%) of the sample reported using an illicit drug at least once in the year before BCT. The highest prevalence of use was for cannabis (28.1%), followed by cocaine (20.7%), sedatives (13.4%), and opioids (8.1%). Use of other drugs occurred for about 1% or less of patients. Table 1 shows no significant differences (all p 's $> .20$) in the prevalence of illicit drug use by gender. Further, although overall prevalence of illicit drug use in this sample was moderate, the frequency of drug use was low, with drug use occurring on an average of about 10% of days in the year before BCT.

3.1.4. Emotional distress symptoms—Female patients reported a significantly higher level of emotional distress symptoms on the SCL-90-R than their male counterparts (see Table 1).

3.1.5. Relationship adjustment—Couples with female and male patients reported clinically significant relationship problems, as shown by mean DAS scores in the problem range (i.e., 97 or lower) and a substantial percentage of patients with DAS scores in this range (65% of males = 198/303; and 62% of females = 64/103). Female and male patients did not differ on the DAS (see Table 1).

3.1.6. Treatment participation—As noted above, early dropout rate before completing baseline assessment was modest (12–13%) and did not differ by gender. Both female and male patients attended an average of 17 (out of 22 planned) BCT sessions, with over 80% attending at least half of planned BCT sessions, and over 75% attending AA during the time when they were receiving BCT. Significantly fewer female patients (63%) took Antabuse than male patients (76%). See Table 1.

3.2. Improvements after BCT for Female and Male AUD Patients

3.2.1. Days abstinent and alcohol-related problems—Table 2 shows that both male and female patients improved significantly at each time period after BCT on PDA and on the DRINC. The magnitude of improvements observed, as shown by the large effect size observed at each time period, was quite similar within the two groups of patients.

3.2.2. Relationship adjustment—A minor variation by gender was noted for the DAS, on which couples with male patients showed significant improvement at all time periods and female patient couples showed such improvement only at 6-month follow-up. However, small effect sizes for improvement were similar between females and males at 6- and 12-month follow-up. Also, when only couples with clinically significant relationship problems at baseline were analyzed, both female and male patient couples showed significant improvement at all time periods and medium effect sizes also were similar.

3.3. Outcomes after BCT for Female and Male AUD Patients

Results of GEE models followed a highly similar pattern for PDA, DRINC, and DAS outcome variables (see Table 3). There were no significant Gender main effects or Gender

by Time interaction effects (all $ps > .079$, indicating that BCT outcomes on PDA, DRINC, and DAS did not differ for female and male patients.⁴

4. Discussion

This naturalistic study of BCT compared female and male AUD patients on drinking and relationship outcomes during and in the year after BCT. We also examined whether clinical problems before and during BCT differed based on gender of the AUD patient. Results overall found few differences between female and male AUD patients taking part in BCT. Note that study results were based on a 20-session BCT protocol, not the 12-session (or fewer) BCT intervention used currently.

Before starting BCT, female and male AUD patients did not differ, and they were quite similar, on most demographic variables, and on standard measures of severity of alcohol problems, illicit drug use, and relationship problems. However, female patients were younger, had shorter duration of problem drinking before seeking treatment, and reported greater emotional distress symptoms as other studies (see Greenfield et al., 2007) have also found. Further, female patients had more PDA in the year before BCT, a finding that other studies have not reported. More abstinence before BCT could be considered an indicator of women AUD patients having overall less severe drinking problems (Greenfield et al., 2007), but this does not seem to be the case in the present study because female and male patients were very similar on a number of standard alcohol severity measures.

During BCT, treatment participation (i.e. low early dropout rate, BCT attendance, AA attendance) was good for both female and male patients who did not differ. However, fewer female patients took Antabuse, possibly due to medical contraindication of Antabuse for women who may become pregnant (Center for Substance Abuse Treatment, 2009). These findings indicate that both female and male AUD patients could be retained in BCT, and that they participated equally in BCT-targeted behaviors such as attending BCT sessions, and going to AA.

Drinking outcomes after BCT showed that both female and male patients improved significantly at each time period after BCT on days abstinent and alcohol-related problems. The extent of improvement was reflected by a large effect size within each patient group at each time period after BCT. When female and male patients were compared on drinking outcomes after BCT, they did not differ significantly. These findings are important. They show statistically and clinically significant improvements on drinking outcomes after BCT for both female and male patients. Increased abstinence and reduced alcohol-related problems are primary BCT goals, that were achieved by both female and male patients in this study.

Relationship adjustment after BCT showed that male patients improved more than females, but for the subgroup with serious relationship problems, small to medium effect size improvements were significant and comparable for both females and males. Further,

⁴Similar Gee model results were found for the subsample of 83 female patients whose male partners did not have a current AUD; these results are available from the first author on request.

relationship outcomes after BCT did not differ significantly for female versus male patients, either for the entire sample or for the subgroup with serious relationship problems. These relationship findings show less robust improvements (small to medium effect) than for the drinking improvements (large effect). They also raise the question of why did females in the overall sample show somewhat less improvement after BCT if relationships are more important to female patients as is often believed.

We can speculate why so few differences were found between female and male patients being treated in BCT. We studied a very specific subgroup of women patients whose male partners either did not have a drinking problem or were open to stopping drinking. These results may not generalize to the many women whose male partners are not invested in changing. Possibly exclusion of women patients with a male partner who refused to address his AUD problem may have produced a non-representative, more functional group of women patients who were less likely to differ from their male counterparts. Unfortunately, information is not available on the number of potential participants who were excluded from the present study because of this criteria. Studies report that as high as 50% of women in treatment for AUDs have a male partner with an AUD as well (Greenfield et al., 2007). Nearly all BCT studies have included only couples in which one member had an AUD because the traditional BCT model relies on the non-AUD spouse to reinforce the AUD-patient's sobriety. As Schumm, O'Farrell and Andreas (2012) noted, future BCT research should include couples in which both members have AUD.

This study had a number of strengths, including a substantial sample size, accepted measures, use of an intent-to-treat sample, high session attendance rates, use of a BCT treatment manual, and high treatment fidelity ratings. Important study limitations should also be noted. First, this study does not support the conclusion that BCT caused the improvements observed in female and male AUD patients because the present naturalistic study did not include a randomized control group. Second, this paper relies on data collected more than 20 years ago. During this time, changes in women AUD patient characteristics (e.g., increased comorbid abuse of prescription pain medication and other opioid drugs), BCT format, and diagnostic systems have occurred. Third, the BCT format studied (i.e., O'Farrell, 1993) consisted of 20–22 sessions over 5–6 months, included AA and Antabuse, consisted of both couple group and conjoint sessions, and was delivered in a stand-alone format without other counseling. Present results may not generalize to other BCT formats that differ on some or all of these components. The most obvious difference between this earlier BCT format and current standard BCT of 12 weekly sessions is reduction in number of treatment sessions. Fourth, a related note due to use of historical data, was that the DSM-III-R criteria which were used to determine alcohol abuse /dependence are no longer current. Finally, the present results may not generalize to AUD patients with extensive drug use (which were excluded from the present study), more ethnically diverse samples, same sex couples, and couples in which both members have a substance use disorder.

To summarize, the present study found no support for the suggestion that BCT might lead to greater improvement and better outcomes for female than male AUD patients on drinking or on relationship measures. Female and male patients did not differ on improvement and outcomes after BCT. Both female and male patients showed large effect size improvements

through 12-month follow-up on PDA and alcohol-related problems, and small to medium effect size improvements on relationship adjustment. Both female and male patients also showed high levels of participation in BCT sessions. There were some gender differences in presenting clinical problems (i.e., females having lower age, years problem drinking, and baseline PDA), but these did not translate into gender differences in response to BCT. The present findings are consistent with recent RCTs (using current patient cohorts, BCT format, and diagnostic system) that show better outcomes for BCT than individual counseling for both female (Fals-Stewart et al., 2006; McCrady et al., 2009; Schumm et al., 2014) and male (Meis et al., 2013) AUD patients. Taken together, these results suggest that clinicians should offer BCT as a first-line treatment option for both men and women with AUD who are living with a partner. Finally, as indicated by recent reviews (Meis et al., 2013; O'Farrell & Clements, 2012), dissemination of BCT is the highest priority for future research.

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Highlights

- We compared behavioral couples therapy (BCT) for female and male alcoholics.
- Few differences were found between female and male alcoholic patients.
- They did not differ on drinking or relationship outcomes after BCT.

Table 1

Characteristics of Female (N=103) and Male (N=303) AUD Patients Before BCT

Characteristic	Female Mean (SD) or %	Male Mean (SD) or %	t or χ^2	p
Demographic Characteristics				
Age	40.0 (8.1)	43.3 (10.0)	3.39	.001**
Education (years)	13.5 (2.2)	13.4 (3.2)	-0.21	.836
Family income (thousands)	60.6 (25.0)	55.3 (26.3)	-1.77	.077
Years Married or Cohabiting	11.2 (9.5)	13.1 (10.7)	1.63	.104
Race-ethnicity (% White)	92.2%	95.4%	1.49	.223
% Married	86%	88%	0.30	.583
Alcohol Problem Severity				
Age of Onset of Alcohol Problem	27.4 (9.2)	27.1 (9.1)	-0.35	.730
Years with problem drinking	12.5 (7.9)	16.1 (10.1)	3.75	<.001***
MAST Score	34.1 (8.5)	35.4 (10.9)	1.32	.187
Alcohol Dependence Scale	18.7 (7.6)	17.8 (9.0)	-1.06	.289
DRINC - Total Lifetime Score	31.1 (7.6)	31.1 (8.7)	0.10	.960
DRINC - Past 90 days score	43.8 (25.1)	46.6 (27.4)	0.91	.364
PDA - % Days Abstinent Past Yr	43.0 (28.2)	34.3 (28.8)	-2.62	.009**
Illicit Drug Use Prevalence				
Any drug use - % of patients	43.7	39.9	0.45	.503
Cannabis use - % of patients	26.7	28.6	0.12	.722
Cocaine use - % of patients	23.3	19.8	0.57	.449
Sedative use - % of patients	17.2	12.1	1.67	.197
Opioid use - % of patients	8.8	7.9	0.08	.773
Stimulant use - % of patients	1.9	1.3	0.20	.652
PCP use - % of patients	0	0.7	0.68	.408
Hallucinogen use - % of patients	1.9	0.7	1.29	.255
Inhalant use - % of patients	0	0.7	0.68	.408
Emotional distress symptoms				
SCL-90-R Global Symptom Index	.92 (.71)	.72 (.54)	2.63	.01**
Relationship Adjustment				
DAS couple score	92.7 (17.8)	90.1 (18.1)	-1.30	.195
% with problems on DAS ^a	62%	65%	0.35	.556
Treatment Participation				
Total BCT Sessions Attended ^b	16.7 (6.2)	17.6 (6.0)	1.27	.204
% with > 11 BCT sessions ^b	81%	83%	0.46	.499
% who took Antabuse	63%	76%	6.34	.012*
% who went to AA	78%	77%	0.01	.926

MAST=Michigan Alcoholism Screening Test. DRINC = Drinker Inventory of Consequences. SCL-90-R= Symptom Checklist-90 Revised
DAS=Dyadic Adjustment Scale.

^a A problem score was defined as a DAS couple score of 97 or less.

^b 22 BCT sessions were planned

p<.001

**
p < .01

*
p < .05 (2-tailed)

Table 2
Improvement on Drinking and Relationship Outcomes After BCT for Female and Male AUD Patients

Outcome variable	Time Period					
	Pre-Tx	Post-Tx		6-mo Fup		12-mo Fup
	Mean (SD)	Mean (SD)	ES <i>r</i>	Mean (SD)	ES <i>r</i>	Mean (SD)
PDA - % Days Abstinent						
Female patients	43.0 (28.2) <i>n</i> = 103	90.7 (18.8) ^a <i>n</i> = 95	.70	83.3 (27.4) ^a <i>n</i> = 96	.59	78.2 (31.3) ^a <i>n</i> = 95
Male patients	34.4 (28.8) <i>n</i> = 303	92.5 (17.3) ^a <i>n</i> = 290	.77	80.4 (28.9) ^a <i>n</i> = 293	.62	74.7 (34.5) ^a <i>n</i> = 288
DRINC - total past 90 days score						
Female patients	43.8 (25.1) <i>n</i> = 103	10.1 (21.7) ^a <i>n</i> = 89	.58	9.0 (16.5) ^a <i>n</i> = 87	.63	15.7 (25.2) ^a <i>n</i> = 91
Male patients	46.6 (27.4) <i>n</i> = 303	8.3 (19.2) ^a <i>n</i> = 281	.63	14.6 (24.3) ^a <i>n</i> = 283	.52	15.4 (24.8) ^a <i>n</i> = 275
DAS couple score						
Female patients	92.7 (17.8) <i>n</i> = 103	98.0 (21.1) <i>n</i> = 86	.14	98.9 (25.0) ^a <i>n</i> = 87	.14	95.5 (24.7) <i>n</i> = 88
Male Patients	90.1 (18.1) <i>n</i> = 303	99.9 (19.9) ^a <i>n</i> = 278	.25	97.9 (23.6) ^a <i>n</i> = 276	.18	94.2 (27.6) ^a <i>n</i> = 261
DAS couple score – for couples with low baseline score^b						
Female patients	81.2 (10.4) <i>n</i> = 64	90.8 (20.4) ^a <i>n</i> = 50	.29	90.8 (26.3) ^a <i>n</i> = 50	.24	88.0 (25.1) ^a <i>n</i> = 54
Male Patients	79.8 (12.4) <i>n</i> = 198	94.7 (19.5) ^a <i>n</i> = 181	.42	90.0 (23.8) ^a <i>n</i> = 179	.26	87.6 (27.8) ^a <i>n</i> = 172

DRINC=Drinker Inventory of Consequences score for past 90 days. DAS = Dyadic Adjustment Scale.

Note: ES *r* = effect size (based on pre vs follow-up t-tests) expressed as a correlation coefficient (Rosenthal, 1991). A correlation value of *r* = .10 was considered a small effect, *r* = .30 a medium effect, and *r* = .50 a large effect (Cohen, 1988).

^a This score shows significant improvement from the Pre-Tx assessment.

^b A low score was defined as a DAS couple score of 97 or less.

Table 3

Generalized Estimating Equation (GEE) Results for Gender and Gender $\times$ Time Interaction Effects While Controlling for Covariates

Percentage days abstinent (PDA) ($N = 393$)				
Predictor	B	95% CI	χ^2	p
Age	.104	-.153, .360	0.631	.427
Years problem drinking	.193	-.061, .448	2.210	.137
Emotional distress	-5.465	-9.488, -1.442	7.088	.008
Pre-tx PDA	.115	.035, .195	7.942	.005
Gender	.120	-6.287, 6.526	0.001	.971
Time	-6.317	-9.244, -3.390	17.892	<.001
Gender $\times$ time	-2.251	-5.628, 1.126	1.706	.191
Drinker Inventory of Consequences (DRINC) total score ($N = 386$)				
Predictor	B	95% CI	χ^2	p
Age	-.161	-.357, .036	2.578	.108
Years problem drinking	-.045	-.241, .151	0.205	.650
Emotional distress	2.754	-.339, 5.848	3.045	.081
Pre-tx PDA	-.004	-.065, .057	0.015	.901
Gender	-.278	-5.448, 4.892	0.011	.916
Time	3.778	2.285, 5.721	24.598	<.001
Gender $\times$ time	-1.359	-4.372, 1.655	0.781	.377
Dyadic Adjustment Scale (DAS) couple score ($N = 383$)				
Predictor	B	95% CI	χ^2	p
Age	.494	.270, .717	18.731	<.001
Years problem drinking	-.031	-.255, .192	0.076	.783
Emotional distress	-6.262	-9.765, -2.760	12.282	<.001
Pre-tx PDA	.021	-.049, .090	0.339	.560
Gender	-.409	-5.824, 5.006	0.022	.882
Time	-3.078	-4.354, -1.802	22.365	<.001
Gender $\times$ time	2.315	-.270, 4.900	3.081	.079

The presented GEE models are based upon the dependent variable correlation structure resulting in the lowest Quasi Likelihood under Independence Model Criterion (QIC) value. Lower QIC values indicate a better model fit to the data. An autoregressive correlation structure was used for PDA, while exchangeable correlation structures were used for DRINC and DAS models.