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Individual versus Group Female-Specific Cognitive Behavior Therapy for Alcohol Use Disorder

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Abstract

Objectives: To test group-based Female-Specific Cognitive Behavioral Therapy (G-FS-CBT) for women with Alcohol Use Disorder (AUD) against an individual Female-Specific Cognitive

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Behavioral Therapy (I-FS-CBT). This aims of this paper are to describe G-FS-CBT development, content, feasibility, acceptability, group process, engagement in treatment, and within-and post-treatment outcomes.

Methods: Women with AUD ($n=155$) were randomly assigned to 12 manual-guided sessions of G-FS-CBT or I-FS-CBT; 138 women attended at least one treatment session.

Results: Women in G-FS-CBT attended fewer sessions ($M=7.6$) than women in I-FS-CBT ($M=9.7$; $p<.001$). Women in both conditions reported high satisfaction with the treatments. Independent coders rated high fidelity of delivery of both G-FS-CBT and I-FS-CBT. Therapeutic alliance with the therapist was high in both conditions, with I-FS-CBT being slightly but significantly higher than G-FS-CBT. In the first six weeks of treatment, women in both treatment conditions significantly reduced their percent drinking days (PDD) and percent heavy days drinking (PHD) by equivalent amounts, maintained through the rest of treatment and the 12 month follow up with no treatment condition effects. Women reported significant improvement in all but one of the secondary outcomes during treatment; gains made during treatment in depression, anxiety, autonomy, and interpersonal problems were maintained during the follow-up period, while gains made during treatment in use of coping skills, self-efficacy for abstinence, self-care, and sociotropy deteriorated over follow up but remained improved compared to baseline.

Conclusions: Findings support the feasibility, acceptability, and efficacy of a group format for female-specific CBT for AUD, a new 12-session, single gender, community friendly, group therapy with programming specifically for women. Similar, positive outcomes for individual and group treatment formats were found for drinking, mood, coping skills, self-confidence, interpersonal functioning, and self-care.

Keywords

Alcohol use disorder; women; female specific therapy; cognitive behavior therapy; group therapy

1. Introduction

Women with Alcohol Use Disorder (AUD) have a distinct clinical and risk factor profile, and may require treatments specific to their unique needs (Epstein & Menges, 2013). Fewer women than men (15% versus 23%) with AUD enter treatment in their lifetime (Cohen, Feinn, Arias, & Kranzler, 2007; Dawson, 1996), and mixed-gender group therapy, typical in AUD and substance use disorder (SUD) treatment, may be unappealing to women, leading to lower access to and engagement in care (Cucciare, Simpson, Hoggatt, Gifford, & Timko, 2013; Lewis et al., 2016). Women may benefit from sharing personal information in all-female groups due to gender-differentiated interactional and dominance styles (Greenfield & Pirard, 2009), high rates of trauma history among women with SUD (Nolan-Hoeksema, 2004), and the particular importance of supportive social networks to women (Velasquez & Stotts, 2003). Female-segregated (i.e. women only) treatment may lower barriers to treatment for women who might not otherwise seek treatment in standard care (i.e., mixed gender or gender-neutral) settings (Greenfield & Grella, 2009) and may enhance retention in treatment (Green, 2006; Grella, 2008). However, female segregated treatment is more effective than mixed gender treatment only when female-specific content is provided

(Dodge, & Potocky-Tripoli, 2001; Epstein & Menges, 2013). Currently, there is limited availability of female-only AUD treatment that addresses the specialized treatment needs of women (Greenfield et al., 2014; Heslin, Gable, & Dobalian, 2015; Prendergast, Messina, Hall, & Warda, 2011).

1.1. Group therapy for women with AUD

Despite the preponderance of group therapy in community SUD treatment settings, alcohol treatment research has focused on efficacy studies for individual therapy (Orchowski & Johnson, 2012; Weiss et al., 2004). One two of 13 rigorous randomized controlled trials (RCTs) since 1994 comparing different types of group therapy for AUD used female-only samples (Orchowski & Johnson, 2012). One studied heavy drinking, not alcohol dependent, women (Walitzer & Connors, 2007); a second tested naltrexone (O'Malley et al., 2007). Orchowski & Johnson (2012) concluded that findings of rigorous studies on group AUD treatment may not generalize to women. Greenfield, Trucco, et al. (2007) developed a female-segregated Women's Recovery Group (WRG) treatment for SUD and compared WRG ($n=16$) to mixed-gender group drug counseling (GDC, $n=7$ women and 10 men). WRG was cognitive behavioral, and focused on topics particularly relevant to women. GDC focused on more traditional SUD treatment topics with no gender-specific content. No differences in substance use (Greenfield, Trucco, et al., 2007) or psychiatric improvement (McHugh & Greenfield, 2010) were found during treatment; women in WRG but not in GDC continued to reduce drinking in the six months post-treatment. WRG women also reported higher satisfaction with treatment. A phase II RCT (Greenfield et al., 2014) was similarly designed to compare WRG ($n=52$) to GDC ($n=48$ women, 58 men) for women with SUD. Treatment outcome was positive with no between-treatment differences. In these studies, the control group included mixed-gender format *and* lacked female-specific content; this design did not isolate the relative contribution of female specific programming (separate from gender-segregated format) in WRG's outcomes.

1.1.1. Comparing group therapy to individual therapy for AUD—In general, studies comparing individual and group modality of the same AUD treatments report no differences between conditions (Magill & Ray, 2009; Sobell, Sobell & Agrawal, 2009), and suggest that individual CBT can be modified for group delivery with comparable treatment results (Graham et al., 1996; Marques & Formigoni, 2001; Schmitz et al., 1997). Sobell et al. (2009), however, emphasized the need for a "pure comparison" of the same stand-alone treatment protocol delivered in individual versus group format, without the confounding influences of the additional meetings or services that are typically provided in existing substance use programs. Sobell et al. (2009) conducted a rigorous RCT comparing individual versus group modalities of a four-session Guided Self-Change Treatment Model for individuals (29% female) abusing alcohol ($n=212$) or drugs ($n=52$), but not with severe dependence. No treatment condition differences were found in reduction of alcohol or drug use, but the group condition was more cost effective. Positive group characteristics such as high engagement, and low conflict and avoidance were noted. Hustad et al. (2014), also using a pure comparison design, compared individual to group Brief Motivational Intervention for college students (32% female) mandated to receive an alcohol intervention, and found no differences in alcohol use or consequences at follow-up. Although these few

studies comparing group with individual treatments provide support for the use of group therapy, none have examined gender effects, nor have any tested individual versus group formats among women specifically (Weiss, 2004). Thus, it is not known if alcohol dependent women would fare better with the greater social support inherent in group versus individual therapy.

1.2. The Current Study

In a prior study (Epstein et al., in press) we reported comparable, positive outcomes for a 12-session, individual modality female-specific cognitive behavioral therapy (FS-CBT) protocol tested against a gender-neutral individual CBT condition (Epstein & McCrady, 2009) for women with AUD. During treatment, women in both conditions were highly engaged, satisfied with treatment, reduced their drinking, depression, anxiety, tobacco and other drug use, and improved their interpersonal functioning, self-efficacy, coping skills, and motivation (Bold, Epstein, & McCrady, 2017; Epstein et al., in press). Positive changes were maintained for the 12 months following treatment. The question remains, however, as to whether such a treatment can be delivered in a groups format. It was expected that a group treatment would yield outcomes at least as good as those from individual treatment.

Given the importance of social support for women in treatment for AUD (see Litt, Kadden, & Tennen, 2015; McCrady, 2004), the apparent value of treatment content specific to women (Epstein et al., in press), the ubiquity of group therapy used in community treatment settings (Orchowski & Johnson, 2012; Roman, 2013), the research supporting efficacy of single-gender AUD treatment for women but only when female-specific programming is provided, and the dearth of evidence-based, single gender MET/CBT female-specific group therapy protocols, the present study aimed to modify and test individual FS-CBT for delivery in group therapy format. The current study is a “pure comparison” RCT (Sobell et al., 2009), comparing a female-only, female-specific group cognitive behavioral therapy (G-FS-CBT) to the female-specific individual cognitive behavioral therapy (I-FS-CBT) from which G-FS-CBT was derived. This paper reports on: (a) the development of a group delivery platform from our existing I-FS-CBT for women with AUD (Epstein et al., in press), including a description of feasibility, acceptability, and group characteristics; (b) the relative efficacy of G-FS-CBT compared to I-FS-CBT on treatment engagement and drinking outcomes during, and 12 months after, treatment; and (c) within-and post-treatment change in secondary outcomes, including coping skills, abstinence self-efficacy, depression, anxiety, interpersonal functioning, self-care, and social network support for abstinence.

2. Methods

2.1. Trial Design

A female-specific CBT individual therapy for AUD (I-FS-CBT; Epstein et al., in press) was adapted for a group therapy delivery platform (G-FS-CBT) and pilot tested in two closed groups. G-FS-CBT was then compared to I-FS-CBT in a RCT. This design kept the content of the I-FS-CBT manual consistent across both treatment conditions, allowing us to test the added value of the group therapy format. The study was conducted at the Center of Alcohol Studies at Rutgers University, and approved by the Rutgers University Institutional Review

Board (IRB). Three adverse events were reported during the grant period, all of which were deemed unrelated to the study by Rutgers IRB.

2.2 Participants

Participants were 155 women recruited from the greater New Brunswick, NJ, area over a period of 26 months (06/2010 to 08/2012). Participants were recruited in a series of 18 cohorts, via advertisements, referral outreach, flyers, and media. To be eligible for the study, women had to be age 18 or older, have a past year DSM-IV alcohol dependence diagnosis (American Psychiatric Association, 2000), have used alcohol in the 60 days prior to a telephone screening, and have no psychotic symptoms in the prior six months, no gross cognitive impairment, and no current physiological dependence on any illicit drug.

Of the 341 women screened, 325 proved eligible and 290 were scheduled for a clinical intake interview. Of these, 182 completed the clinical intake interview, and 155 completed the baseline interview and were randomized; 138 attended at least one treatment session and were included in analyses. Most of those excluded dropped out before the baseline interview, expressed a lack of interest, or claimed to have practical barriers to participation. Of those included, 75 were assigned to I-FS-CBT (73 attended at least one treatment session) and 80 to G-FS-CBT (65 had at least one treatment session). See Figure 1. Table 1 shows baseline characteristics. There were no differences between treatment conditions on baseline variables. Participants were 48.65 years old on average, with median age of 50 and range of 19 to 75. The sample was 87% white, 8.7% black, and 4.4% more than one race. About half the sample (56.52%) was employed full or part time. Average annual income was \$90,000 (SD = \$106,511) with a wide range. Median household income was \$66,000; 30% (n=41) of the sample had a household income of $\leq$ \$37,000, 28 of whom had household income of $<$ \$20,000. When income was recoded for 3 extreme upper outliers to 2 standard deviations above the mean, mean household income was \$82,815. In terms of educational level, 28% (n=39) of the sample reported high school, GED or lower; 25% (n=35) had a 2 year college degree or vocational/technical certificate; 30% (n=42) had a Bachelor's degree, and 17% (n=24) had a masters degree or higher. Participants all met criteria for Alcohol Dependence, and on average reported drinking on over 65% of the 90 days prior to last drink before the baseline interview and over 7 drinks per drinking day.

2.3. Procedures

Participants completed a telephone screen for initial eligibility and were scheduled for an in-person clinical intake interview. Intake clinicians had 18 hours of training. Consented women were scheduled for a baseline research interview (BL) approximately one week later. A bachelors or masters level research interviewer administered questionnaires and semi-structured interviews for the BL. BL interviewers had 44 hours of training. Participants were paid \$50 in gift cards for BL completion. At the end of the BL, participants were randomized to treatment condition. During the 12 session treatment period, women completed assessments at the beginning and end of each therapy session on secondary outcome and therapy process variables; participants received a \$10 gift card for completing these assessments at each session. In-person follow-up interviews were done at 3, 9, and 15 months post-session 1. Participants received \$50 gift cards for the 3-and 9-month and \$75

for the 15-month interviews. See Figure 1 for details on attrition. There were no treatment condition differences in follow up rates by condition.

2.3.1. Participant Flow and Randomization—At the start of the study, 16 women completed pre-treatment assessments and were block randomized to treatment condition. Due to slower than expected recruitment patterns, the randomization procedure was then changed to allow women to begin treatment more quickly; subsequent blocks of 6 (± 2) consecutive new participants were randomized to either start a group or to all be assigned to individual therapy. For the final (18th) cohort, we reverted back to our original strategy of accumulating 16 participants until completion of the baseline interviews and then randomly assigning each woman to group or individual therapy. There were three protocol deviations from the randomization process: (a) a married couple was randomized so that one spouse received group and the other received individual therapy to avoid the partners being in the same group; (b) due to circumstances outside of their control, two participants were unavailable for a group, so were re-assigned to individual condition. In I-FS-CBT, scheduling of sessions depended only on the patient and therapist; missed sessions were rescheduled so each participant had the opportunity to receive 12 session. In G-FS-CBT, missed group sessions could not be made up so fewer women in the group condition were able to attend all 12 sessions.

2.4. Study Measures

2.4.1. Screening and Intake—A Telephone Screen was used to provide study information and assess initial eligibility. An in-person clinical research intake interview assessed demographics, recent and lifetime substance use and diagnosis, level of care needs, psychotic symptoms (First, Spitzer, Gibbon, & Williams, 2002) and gross cognitive deficits (Folstein, Folstein, & McHugh, 1975). Women verbally committed to an abstinence goal for the duration of the treatment.

2.4.2. Alcohol and Drug Use History and Severity—The Structured Clinical Interview for DSM-IV Disorders (SCID-I; First et al., 2002) was used to diagnose alcohol and other substance dependence or abuse. Inter-rater reliability is high for AUD (kappa .75) and SUD (kappa .84) (Zanarini et al., 2000, Williams et al., 1992). Daily drinking and drug use in the 90 days preceding the last drink before the Baseline interview was obtained with the Timeline Follow-back Interview (TLFB, Sobell & Sobell, 2003; Tonigan, Miller, & Brown, 1997) to derive percentage of drinking days (PDD), percentage of heavy drinking days (PHDD, defined for women as 4 or more standard drinks per day (Greenfield et al., 2010)), mean drinks per drinking day (MDPDD), and percent of sample abstinent. A breathalyzer was administered before every assessment and treatment session. In no case did breathalyzer data invalidate self-report of no alcohol use.

2.4.3. Other Psychopathology—The SCID-I (First et al., 2002) was used to diagnose current/lifetime mood and anxiety disorders (DSM-IV, American Psychological Association, 2000). Inter-rater reliability is high for mood/anxiety disorders (.84-1.00; Zanarini et al., 2000, Williams et al., 1992). The Structured Clinical Interview for DSM-IV Personality Disorders (SCID-II; First et al., 2002) was used to assess personality disorders. Inter-rater

reliability is high for SCID-II (e.g., kappas of .89-.98; Schneider et al., 2004). The Beck Depression Inventory (BDI-II, Beck, Steer, & Brown, 1996), assessed depression symptoms over the prior two weeks (scores range 0-63), Cronbach's $\alpha = .90$ for this sample. The Beck Anxiety Inventory (BAI, Beck, Epstein, Brown, & Steer, 1988) was used to assess anxiety symptoms in the last week (scores 0-63), with sample Cronbach's $\alpha = .93$.

2.4.4. Social Support, Self-Efficacy, Coping, Psychosocial Functioning—The Important People Inventory (IPI; Longabaugh, Wirtz, Zweben, & Stout, 1998) assesses social network structure, network drinking and network response to drinking and abstinence. Percentage of network accepting/encouraging abstinence and percentage of network abstainers/in recovery were used in the current study. The Situational Confidence Questionnaire-8 (SCQ-8; Breslin, Sobell, Sobell, & Agrawal, 2000) measures self-efficacy to abstain from alcohol use in high-risk situations; each item is rated 0% to 100% for a global confidence score. Cronbach's $\alpha = 0.86$ in this sample. A modified version of the Coping Strategies Scale (CSS; Litt, Kadden, Cooney, & Kabela, 2003) assessed use frequency of 30 strategies to cope with alcohol use and non-alcohol related situations, on a scale of 1 (never) to 4 (frequently) for a mean score across all items; Cronbach's α was 0.95. The Sociotropy-Autonomy Scale (SAS; Bieling, Beck, & Brown, 2000) measures the extent of an individual's concern with others' opinion of herself (sociotropy) and self-confidence, behavioral and emotional independence (autonomy). Cronbach's α for this sample was .89 for sociotropy and .77 for autonomy. The Inventory of Interpersonal Problems (IIP-32, Horowitz, Alden, Wiggins & Pincus, 2000) assesses problems in 10 interpersonal domains, rated on a 0 to 4 scale. A total sum score was used for this study; higher scores reflect more interpersonal problems; Cronbach's α was 0.92.

2.4.5. Study measures administered in the within-treatment period—Women kept daily drinking Logs (DDLs) of drinking, drug use, and cravings each day during treatment. DDLs were reviewed at each treatment session. Follow-up TLFB data substituted for missing DDL data, with DDL data being the primary data source to compute within-treatment drinking variables (PDD, PHD). DDL data correlate significantly with retrospective TLFB data at end of treatment (McCrady, Epstein, & Hirsh, 1999). Secondary outcomes were assessed during treatment using abbreviated versions of several of the measures described above, completed before each treatment session, to study temporal changes in secondary outcomes during treatment. To create the abbreviated measures, factor analyses on each full measure were conducted using baseline data available from a prior study of women with AUD (McCrady, Epstein, Hallgren, Cook, & Jensen, 2016). We retained items for each measure with the highest factor loadings and examined internal consistency. The final pre-session battery included the full BDI-II (full scale, 21 items, Cronbach's $\alpha = .89$) and abbreviated measures of the BAI (9 item scale, Cronbach's $\alpha = .88$), Sociotropy (8 items, Cronbach's $\alpha = .83$) and Autonomy Scale (8 items, Cronbach's $\alpha = .78$), Situational Confidence Questionnaire (5 items, Cronbach's $\alpha = .81$), Coping Strategies Scale (30 items, Cronbach's $\alpha = .93$), and Important People Interview (3 items: relationship type, drinking frequency, and support for abstinence of up to 10 important social network members). Participants also rated 8 domains of self-care (seek medical care, have free time, pleasurable activities, social contact, attend treatment, exercise, do nice things for oneself,

buy nice things for oneself). A homework record for each participant was completed by the therapist each session to track assigned and completed homework. The Working Alliance Inventory – Short Form (WAI-SF; Tracey & Kokotovic, 1989) is 12-item self-report measure of the therapeutic alliance (7-point scale with a total possible score of 84), and was completed after each therapy session. The WAI-SF has strong internal consistency, inter-rater reliability, and predictive validity (Busseri & Tyler, 2003). We report client-rated alliance with therapist for both conditions and alliance with the group members for G-FS-CBT. The End-of-Treatment Questionnaire (see Najavits et al., 1998) measures client ratings of helpfulness of therapy elements on a 7 point scale of –3 (greatly harmful), –2, –1, 0 (neutral), +1, +2, +3 (greatly helpful). Two more items measured client's estimated future use (0% (not at all) to 100% (totally)), of what she learned in treatment, and how likely she would be to recommend the treatment to someone else. Cronbach's alpha in our sample was 0.93.

2.4.6. Study measures of group description and process—From an original 90-item version, we used the first 40 items of the Group Environment Scale-Form R (GES, Moos, 2002) to measure 10 group process subscales (e.g., Cohesiveness, Leader Support, Order/Organization, Expressiveness, Anger/Aggression, See Table 3), each with a mean scale score for 4 items rated on a 0-4 scale. Subscale alphas for the original measure range from .62 to .86, and test-retest reliabilities range from .65-.87 (Moos, 2002). The GES-R was completed by group members after sessions 1, 4, 8, and 12. Therapist group behaviors (adapted from Hamilton et al., 1993), were rated by objective raters listening to audiotaped sessions (see Table 3). Group therapy process using Yalom's curative factors scale (Yalom & Leszcz, 2005) was rated by objective raters listening to audiotaped sessions, evaluating the extent to which therapists facilitated, and group members exhibited, 12 curative factors (see Table 3). Each participant also recorded time spent with group members outside of therapy sessions.

2.5. Development and pilot of the group manual

Our existing I-FS-CBT manual served as the base for the new G-FS-CBT manual. For the group manual, we retained the content and order of interventions and themes (see below) from the I-FS-CBT manual to allow for a pure comparison. G-FS-CBT was designed for a group of four to eight women, with an ideal group size of six. We piloted the manual in two initial groups ($n=5$ and $n=3$). A qualitative and quantitative review of feasibility, content, format, and outcome was discussed in research team meetings. We revised the manual based on pilot results, keeping the coping skills focus of the group, restructuring and simplifying session content, and enhancing focus on importance of attendance and homework, resulting in a final 12 session therapist manual and patient workbook for the RCT.

2.6. Treatment conditions and therapists

In I-FS-CBT (Epstein et al., in press) each participant saw a therapist weekly. The first session was 90 minutes long, and subsequent sessions were 60 minutes long. The I-FS-CBT manual included core CBT, motivational enhancement, and relapse prevention components, and employed a non-confrontational, collaborative therapist style. All language, examples, vignettes, worksheets, and illustrations were female-specific. Two core thematic women's

issues were integrated into each session via discussion and illustrative material: (a) self-confidence, emphasizing the woman as an active agent in her own life to enhance autonomy and empowerment and reduce sociotropy (i.e., to become less emotionally and behaviorally reactive to others' negative behavior and perceived expectations), and (b) self-care, emphasizing the value of caring for the woman's personal well-being through activities such as exercise, leisure activities, and good nutrition. The I-FS-CBT manual also included several intervention modules linked to an issue of particular importance for females with AUD: (a) social support for abstinence, including coping with heavy drinkers in the social network and increasing sober members in the social network; (b) interpersonal functioning, including connecting with others in respectful, nurturing relationships, increasing autonomy and assertiveness, and decreasing negative reactivity to others; (c) coping with mood problems, negative affect, and emotion dysregulation; and (d) psycho-education about women and alcohol. See Table 1. Also see examples of the female specific interventions in supplemental materials.

The G-FS-CBT manual included material identical to I-FS-CBT, but the session organization was modified for a closed group format. The group treatment was designed to provide didactic presentation of coping skills and motivational enhancement material, and group discussion and rehearsal of new skills within a supportive atmosphere that facilitated mutual emotional support and support for abstinence. G-FS-CBT therapists also were trained to encourage certain CBT-consistent group processes derived from the Yalom Group Therapy model (Yalom & Lescz, 2005), including group cohesion, universality of experience, and reciprocal learning among group members. Each group member received the same patient workbook as the I-FS-CBT participants. During each session, the group leader modeled teaching and rehearsal of one or two skills with one group member. The group leader would lead the member through an exercise, using a flipchart to write down the prescribed worksheet material together in front of the group. The other group members watched, followed along, completed worksheets for their own situations, and provided input and support to the group member. The first session of G-FS-CBT was 2 hours; remaining sessions were 90 minutes. Group members were neither encouraged nor discouraged from contacting one another outside the group for support and social interaction, though interactions outside the group were tracked.

In both I-FS-CBT and G-FS-CBT conditions, attendance at peer-support self-help meetings was neither encouraged nor discouraged, but was tracked weekly. Self-help attendance rates were low overall; 109 (81.3%) of the 134 women who provided data reported no attendance at self-help groups during the study treatment period. This rate did not differ between group (80.6%) and individual (81.9%) conditions ($p = .99$). A t -test also yielded no significant treatment condition differences in mean number of self-help meetings attended.

2.6.1. Study Therapists—All study therapists were trained to conduct both of the treatments in this study, to minimize confounding of treatment effects with therapist effects. Therapists completed approximately 45 hours of training to deliver both treatment protocols. Once the therapist completed training and was approved by the supervisor to see cases, the clinical supervisor listened to all sessions of the therapist's first two individual clients. The clinical supervisor also listened to selected group therapy sessions of the first group co-led

by the therapist-in-training and the majority of group sessions of the first group led by the therapist-in-training. Therapists continued to receive close supervision via weekly individual and team supervision meetings, and supervisors periodically listened to therapists' sessions or clips. There were 15 therapists (13 female, 2 male). Four therapists had a doctoral degree in clinical psychology or social work, three had a master's degree in social work or counseling, and eight were advanced (master's level) doctoral candidates in clinical psychology programs. All 15 therapists were cross trained to deliver both treatment conditions but four (all women) of them delivered therapy only in the individual condition, due to need for fewer therapists overall in the group condition than the individual therapy condition.

2.6.2. Therapy Integrity Fidelity—Every therapy session was audio-taped and therapy integrity was assessed for a subset of these tapes via: (a) the Therapist Checklist, independent rater version, to code treatment components delivered in each session from 3 to 0 as thoroughly, moderately, minimally, or not covered. Average pairwise percent agreement within one point for the Therapist Checklist across 9 independent raters listening to audiotaped sessions, was 94%; and (b) the Treatment Integrity Rating System (TIRS, see Hallgren et al., 2016) created for this study, which included 39 five-point Likert scale items to assess domains common to both treatment conditions (e.g., general interventions, female-specific interventions, common factors) and unique to a single treatment condition (e.g., group therapy interventions). Across 9 raters, pairwise ICCs were .63 for the TIRS. Study personnel and hired consultants rated audiotapes using these therapy integrity measures. In total, 178 individual and 37 group sessions were rated, which comprised 29.5% and 30% of the sessions attended per client. Half of these were double rated by a second independent rater. The nine raters comprised three doctoral level psychologists (including the first and fourth authors, who trained the other 8 raters), and six doctoral candidates in clinical psychology. Rater training totaled 17 hours, including familiarizing with the treatment manuals and sessions practice coding four sessions, three training workshops (didactic review of the coding systems, coding sessions together, review of practice coding).

Therapist Checklist results indicate that 95.8% of I-FS-CBT and 98.1% of G-FS-CBT prescribed treatment components were delivered at least minimally with no treatment condition difference in percent delivered ($t(69.8)=1.22, p=0.23$). Average therapy integrity ratings across 39 TIRS items rated on quantity (1=not at all, 2=a little, 3=somewhat, 4=considerably, 5=extensively) showed no treatment differences between G-FS-CBT (mean 3.10, $SD=0.55$) and I-FS-CBT (mean 2.98, $SD=0.60$). G-FS-CBT mean quality rating (3.73, $SD=0.34$) in delivery of prescribed interventions across items (1=very poor, 2=poor, 3=adequate, 4=good, 5=excellent) was slightly but significantly higher than that of I-FS-CBT (3.60, $SD=0.44$; $t(64.09)=2.00, p<.05$). For group therapy items, mean quantity rating was 3.24 ($SD=0.72$) and mean quality rating was 3.7 ($SD=0.48$).

2.7. Power to Detect Effects

Analyses were conducted to determine our power to detect effects given our sample size of 155. Statistical power for detecting differences between treatment conditions was estimated using simulation methods (Hallgren, 2013; Muthen & Muthen, 2002) conducted in R (R

Core Team, 2015). Hypothetical outcome data were simulated from growth curve models with similar fixed and random effects as those obtained from a previous clinical trial of CBT for women with alcohol dependence (Epstein et al., in press). Linear growth terms were specified to yield mean differences in PDD between treatment conditions that were approximately equal to Cohen's $d = 0.5, 0.4, 0.3$, or 0.2 , which corresponded with mean differences in PDD between conditions of 16.5, 13.2, 9.9, and 6.6, respectively, assuming a pooled SD of 33 (similar to that found in Epstein et al., in press) and an obtained sample size of 155. One thousand hypothetical datasets were simulated from each combination of effect sizes and the proportion of datasets with significant treatment differences were used to estimate power. Results indicated that power was high when between-condition effect sizes were specified as moderate ($d = 0.5$, power = 0.91), marginal when $d = 0.4$ (power = 0.74), and low for small effect sizes ($d = 0.3$, power = 0.48; and $d = 0.2$, power = 0.25).

2.8. Data analysis plan

All analyses used a modified intent-to-treat approach wherein all participants who were randomized and completed at least one treatment session ($n=138$) were included in all statistical analyses whenever data were available. Analyses of primary and secondary longitudinal outcomes were conducted using growth curve models to estimate change over time in both treatment conditions during the within-treatment and the post-treatment periods (Raudenbush & Bryk, 2002). The within-treatment period was specified as the first 14 weeks after first treatment session (i.e., in group therapy condition, group therapy session #1, regardless of whether the participant attended that session). Descriptive statistics and model fit indices supported two-piece, elbow-shaped linear trajectories for multiple outcome measures during the within-treatment period, with one slope representing change during early treatment (weeks 1-6) and another slope representing change during late treatment (weeks 7-14), and single linear trajectories for the post-treatment period. Time variables were centered with the value 0 indicating the sixth week of within-treatment data (i.e., the point of the elbowing) for within-treatment analyses and the 15th month of data for the post-treatment data, such that main effects of treatment condition in these analyses would reflect the raw differences between conditions at these time points. Posttreatment growth curve models included only a single linear growth term. All models included random intercepts and random slopes over time.

Growth curve models tested for differential rates of change between the treatment conditions across specified *periods* of time, indicated by significant treatment X time interactions. In addition, differences between conditions at a specific *point* in time were indicated by a significant main effect of treatment condition, with the specific point in time corresponding to when the time variable was coded as zero. When treatments differed in rates of change over time, we conducted follow-up tests to identify at which points in time significant differences were present between conditions by recentering the time variable across different points and testing main effects of treatment condition (McCrary, Epstein, Cook, Jensen, & Hildebrandt, 2009).

Growth-curve analyses used two-level mixed models with time nested within participants. Three-level models (using treatment group as a third level) were considered and tested, but

ultimately removed from the analyses because intra-class correlations (ICCs) indicated that little outcome variability was accounted for by between-group random effects (median ICC=0.04, range=0.00 to 0.11). More importantly, the addition of a third level at times produced convergence issues and imprecise estimates of change, likely due to multiple random effects, particularly for within-treatment models, which had three other random effects.

PDD and PHDD were used as the primary drinking clinical trial end-points; they are two of the most commonly used measures of consumption frequency and quantity, and are both continuous measures that offer greater statistical power than binary outcome measures (Witkiewitz et al., 2015). Models for continuous outcomes controlled for baseline, mean-centered values of the same outcome measure. Models for binary outcomes controlled for baseline, mean-centered values of PDD (any drinking outcome) or PHDD (any heavy drinking outcome) and used a logit link function. Treatment conditions were coded as -0.5 (individual) and 0.5 (group). Growth curve models were analyzed in R using the lme4 procedure (Bates, Maechler, Bolker, Walker, 2014), and restricted maximum likelihood estimation to reduce bias associated with missing data (Hallgren & Witkiewitz, 2013).

Because secondary (non-alcohol) within-treatment measures (collected before or after each treatment session) were usually shortened (see measures section) to reduce participant burden, full-instrument total scores were estimated from the shortened instruments to facilitate comparison across different time points. Specifically, multiple regression models were fitted using baseline data with full-instrument total scores predicted by the subset of items included in the shortened measure. The resulting regression equations were used to estimate full-instrument total scores from the shortened measures collected at each treatment session. This approach likely yielded a high degree of accuracy for predicting full-instrument total scores for the weekly within-treatment data: correlations between model-estimated scores and full-measure scores were high within the baseline data on which the models were fitted ($r = 0.95$ to 0.99 ; normalized root mean square deviation = 0.03 to 0.06) and within the 3-month outcome data on which the data were not fitted ($r = 0.96$ to 1.00 , normalized root mean square deviation = 0.01 to 0.07). See Supplemental Materials Part 2 for an example of shortened measure scores conversion to full scores.

3. Results

3.1. Objective 1: Feasibility, acceptability, and description of groups

Treatment was delivered across twelve therapy groups ranging in size from three to seven women ($M = 5.42$, $SD = 1.31$). A smaller percentage of participants in the group condition attended at least one treatment session (65 of 80, 81.3%) compared to the individual condition (73 of 75, 97.3%), $\chi^2(1) = 8.67$, $p = .003$. Higher attrition from the study after randomization in the group condition most likely was due to practical issues related to a group format; some women were not willing or able to change their schedules to attend the available group.

Participant ratings of treatment satisfaction were high in both conditions with no significant treatment difference; overall rating of helpfulness of the treatment was $+2.77$ ($SD=0.58$)

(i.e., “greatly helpful”). In G-FS-CBT, the group format was rated on average as +2.8 ($SD=0.63$), With no treatment condition differences, participants reported estimated future use of 92% ($SD= 16.7$) of the material learned in treatment and a high chance (95%, $SD= 15.7$) of recommending the treatment to someone else.

Ratings of group therapist behaviors by objective raters are shown in Table 3. In general, therapists focused on facilitating interaction, participation, and support among group members, without a psychodynamic, “here and now” group processing stance (Yalom & Leszcz, 2005). Ratings by the group members on Group Environment Subscales are shown in Table 3. In general, members described the groups as being high in cohesion, leader support, task orientation, self-discovery and order/organization. In regard to group process, of 12 theorized group therapy curative elements (Yalom & Leszcz, 2005), altruism, group cohesiveness, universality, guidance, and instillation of hope were identified by independent raters as present to a considerable extent. Data on contact with other group members outside of sessions indicated that 20 out of 58 participants (34.5%) in group CBT indicated they had contacted at least one other member outside of group treatment sessions during the treatment period. At 6 months post-treatment, 18.6% of all group members reported having continued contact with at least one other group member and 14.0% of women at 12 months post-treatment reported continued contact with at least one group member.

3.2. Objective 2: Compare G-FS-CBT to I-FS-CBT on engagement and drinking outcomes

3.2.1. Treatment engagement—Descriptive statistics for each condition on treatment engagement, fidelity, satisfaction, and average therapeutic alliance during treatment are presented in Table 2. Participants in the group condition attended significantly fewer sessions than participants in the individual condition, with a difference of about two sessions. Likewise, women in the individual condition were involved in treatment for about 10 days longer. Participants completed just over 80% of assigned homework with no difference between conditions. Therapeutic alliance with the therapist was significantly higher in I-FS-CBT (69.43, $SD=5.71$) than in G-FS-CBT (65.98, $SD=7.63$), but both were high on average and improved significantly across both conditions during the both the first and second six session treatment periods. Further probing for regions of significance indicated there was higher alliance in the individual condition compared to the group condition during treatment weeks 1-5 (all $p < .04$). Therapeutic alliance toward group members in G-FS-CBT increased significantly during each half of treatment within the group therapy condition; averaged across all sessions, ratings of alliance with group were 65.21 ($SD=7.39$). See Tables 2 and 6.

3.2.2. Alcohol use outcomes.

3.2.2.1. Within treatment alcohol use outcomes: Growth curve models that reflect changes in drinking during treatment are provided for PDD, PHDD, and binary outcomes reflecting any drinking and any heavy drinking in Table 4. Plots of these trajectories are displayed in Figure 2. There were significant reductions in each drinking variable during the first six week treatment period across both conditions; these improvements were unchanged during the second half of treatment for all measures except a binary drinking measure which continued to decline and reflected a greater probability of weekly abstinence during the

second half of treatment. There were no significant main effects of treatment condition or differences between conditions in rates of change over time for continuous drinking measures. Women in the group therapy condition had slightly but significantly slower rates of improvement in binary outcomes, reflecting more weeks with drinking or heavy drinking during the early treatment period. However, follow-up moving-intercept models indicated no significant differences between conditions on these outcomes at any point in time (all $p > .10$).

3.2.2.2. Post Treatment alcohol use outcomes: Growth curve models that reflect changes in drinking during the 12 month post-treatment period are presented in Table 5. Plots of these trajectories are displayed in Figure 3. Drinking outcomes did not change significantly over the follow-up period and, and no significant treatment X time interactions emerged, indicating that the reductions in these outcomes during treatment were sustained equally, on average, in both conditions over the follow-up period.

3.3. Objective 3: Compare G-FS-CBT to I-FS-CBT on secondary outcome variables

3.3.1. Within treatment secondary outcomes—Changes in within-treatment secondary outcomes are presented in Table 6. Plots of these outcomes are displayed in Figure 4. Anxiety, coping skills, self-efficacy, autonomy, and sociotropy improved significantly across both conditions during the both the first and second six session treatment periods. Depression and self-care improved significantly across both conditions during the first half (six sessions) of the treatment period but not the later treatment period. The percentages of social network members who were abstinent/in recovery or who encouraged abstinence did not change significantly during either the first or second half of the treatment period. None of these measures had significantly different rates of change over time between the two conditions (treatment X time effects). Since the IIP-32 was administered only at baseline and follow up, repeated-measures mixed model was used to examine change over time during treatment and treatment condition differences in interpersonal problems. We found a significant reduction in interpersonal problems across the full sample during the treatment period ($B = -5.58$, $SE = 2.16$, $t(117.66) = -2.59$, $p = 0.01$) and no evidence of differential change during treatment between the two conditions ($B = 0.84$, $SE = 2.90$, $t(116) = 0.29$, $p = 0.77$).

3.3.2. Post treatment secondary outcomes—Changes in post-treatment secondary outcomes are presented in Table 7. Plots of these outcomes are displayed in Figure 5. There were no significant changes over time in the follow-up period on depression, anxiety, autonomy, interpersonal problems, or network members who were abstinent/in recovery, indicating that any improvements made during treatment on these measures were sustained, on average, over the 12-month follow-up period. Use of coping skills, self-efficacy, sociotropy, network encouragement for abstinence, and self-care behaviors deteriorated slightly but significantly over time, with no treatment condition differences. However, despite some decline among these variables, coping, self-efficacy, and sociotropy were still significantly improved at the 15-month time point compared to baseline (all p 's $< .01$). Contrary to expectations, network encouragement for abstinence was significantly lower at the 15-month time point than at baseline, $t(102) = 2.58$, $p = .01$.

4. Discussion and Conclusions

This study aimed to modify and test our efficacious individual I-FS-CBT protocol (Epstein et al., in press) for delivery in a group therapy format. An evidence-based, single-gender CBT group therapy with female-specific programming for AUD would be an important addition to current treatment options (Cucciare et al., 2013; Pendergast et al., 2011). The current study was a “pure comparison” RCT (Sobell et al., 2009) comparing a female-only, female-specific CBT group therapy (G-FS-CBT) to the individual modality (I-FS-CBT) from which G-FS-CBT was developed. Protocols were administered as stand-alone outpatient weekly sessions in a clinic created for this RCT, thus allowing us to determine the effect on outcomes of the individual versus group format specifically.

G-FS-CBT was delivered with high therapeutic adherence and alliance, and high patient engagement and satisfaction. Quality of delivery was good in both treatment conditions, but rated better in G-FS-CBT. The groups achieved an intended climate as cohesive, task-oriented, semi-structured, and coping skills-based; groups incorporated interpersonal support among members but deliberately did not provide “here and now” process-oriented, psychodynamic interpretation or content (Yalom & Leszcz, 2005). Although women in both conditions were highly engaged in treatment, and no condition differences were reported in overall satisfaction with treatment, women in G-FS-CBT attended fewer sessions; this was likely due to the closed group format since missed sessions (due to illness or vacation) were not able to be made up in G-FS-CBT but could be for women in I-FS-CBT. However, an alternative possible explanation for lower attendance in G-FS-CBT is that the more intensive individual attention in I-FS-CBT may be linked to attendance.

A rolling admissions protocol for G-FS-CBT might result in more sessions attended, since women could make up missed sessions; also, most community-based groups for AUD offer rolling admissions, so that format may be preferable for future research. Closed groups may allow for a more coherent flow of treatment in which each session builds on prior material in a deliberate order of presentation and perhaps would facilitate more group cohesion and inter-member support. On the other hand, rolling admission groups provide immediate availability of group treatment to women to enhance accessibility to treatment, and also might facilitate more peer support from seasoned to incoming group members. We recently piloted a rolling group adaptation of G-FS-CBT for 19 women with AUD who entered an open group that ran for 10 months; women attended an average of 15 sessions and reported significant improvements in drinking, cravings, and mood.

In the current study, despite fewer sessions attended, G-FS-CBT treatment outcomes were not different from those of I-FS-CBT and both conditions were associated with improvements in alcohol consumption that were maintained throughout the 12-month follow up. All non-drinking outcomes also improved significantly during treatment with no treatment condition differences, except for social network support for abstinence. Improvements were sustained over the 12-month post treatment period with no treatment condition differences for depression, anxiety, autonomy, or interpersonal problems. Use of coping skills, abstinence self-efficacy, self-care, and sociotropy deteriorated over the follow up period across both treatment conditions but remained significantly improved compared to

initial baseline scores. Deterioration of certain secondary outcomes support use of an “open group” rolling admissions format, since the option of periodically attending an ongoing group after completing 12 core sessions can provide a continuing care option (McKay, 2013).

Results of this study are consistent with the wider literature showing generally equivalent outcomes for group and individual therapies for AUD and SUD (Magill & Ray, 2009; Sobell et al, 2009). The study results are also consistent with our previous work showing that our female-specific protocol is associated with positive outcomes in both drinking and other outcomes deemed particularly relevant for women (Epstein et al., in press) and with a study showing benefit for a coping skills-based, female-specific, women-only group for SUD (Greenfield et al., 2014).

Contrary to expectations, there was not improvement in women’s reported social network support for abstinence in either condition. Therapists did not explicitly encourage socializing outside of the group, and the didactic, structured, and time-limited nature of these CBT groups may have decreased likelihood of group members connecting outside of group as well. Also, across conditions, women reported a high percentage of their network was supportive of their abstinence at baseline (72.4%), so they may not have felt the need to expand their social networks.

Study strengths include a rigorous RCT pure comparison (Sobell et al., 2009) of the same female-specific CBT content provided in two different delivery platforms. Both treatment protocols followed structured, detailed and easy-to-use therapist manuals, along with patient workbooks used collaboratively by patient(s) and therapist. A rigorous therapy integrity evaluation confirmed high adherence to the manual, and high quality delivery. Validated assessment measures were used, followup rates were very good, and sophisticated data analytic strategies were used. Several well-trained and carefully supervised therapists were used for the study, and all were cross-trained to deliver both treatment conditions to avoid therapist bias in the design. The treatment is clinically sophisticated and includes alcohol-related coping skills, motivational enhancement strategies, general coping skills, relapse prevention, and well-specified female-specific interventions and content. The group therapy characteristics and process variables were assessed using validated group environment and group theory measures coded by independent raters.

A limitation of the study is that the sample was somewhat homogeneous in race/ethnicity, and average levels of income and education were relatively high, possibly limiting the generalizability of the findings to more diverse populations and treatment settings. However, variability in the sample is evident, with a wide range in age, income, and education, allowing for empirical testing of age and SES moderators of G-FS-CBT performance in a subsequent study. Since the core G-FS-CBT material is based on female-specific themes and content areas broadly applicable to women, and the interventions are designed to be implemented in a personalized way to fit each patient’s clinical presentation, circumstances, and case conceptualization, it is likely that the core content would not have to be revised substantively for use with a younger, more diverse, lower income population of women who are seeking treatment for AUD. For primary substance use disorder patients, the G-FS-CBT

core content can be applied to a range of drugs but vignettes and examples as well as psychoeducation about specific substances would likely need to be added. Another limitation of the study is that though a breathalyzer was administered at the start of each session, no additional biological or biochemical verification was done to validate self-report of drinking on other days.

4.1. Conclusions: Clinical and research implications

Only 15% of women with AUD seek treatment for it (Dawson, 1996). Women may be more likely to access help for AUD if single-gender treatment is offered (Cucciare et al., 2013); however, single-gender AUD treatment seems to be efficacious only if female-specific programming is included (Epstein & Menges, 2013; Greenfield, Brooks, et al., 2007), and there are few evidence-based, single-gender, female specific group therapy protocols available.

G-FS-CBT successfully addresses both drinking problems and other issues found to be prevalent in populations of women who seek treatment for AUD. Furthermore, it has collateral benefits in improving some health outcomes (Bold et al., 2017), and is useful for a wide range of female patients, including those who have co-morbid drug use problems (Epstein et al., 2015). This protocol can be used as a closed, 12 session group therapy option in outpatient settings or can be embedded as a treatment option amid more comprehensive SUD services. Fewer sessions attended but equivalent outcome of G-FS-CBT compared to I-FS-CBT suggests that a closed group format works well, despite a limitation of not being able to make up missed sessions. However, in most community SUD treatment settings, rolling entry therapy groups are more typical (Roman, 2013), and an open entry G-FS-CBT would also be consistent with a continuing care approach to help maintain gains made. Thus, future adaptation of the current G-FS-CBT for an open enrollment delivery platform is a promising line of work. Cost-effectiveness of G-FS-CBT will be examined in a future paper. Mediators and moderators of drinking outcomes including demographics, group process measures and group member contact outside of session during or after the treatment period were beyond the scope of the current paper but are also important to examine in the future. In addition, this new, evidence based G-FS-CBT can be compared in future studies to a mixed gender adaptation in community settings to evaluate if G-FS-CBT enhances accessibility and utilization of treatment for women with AUD.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Highlights

- Developed a group female-specific cognitive behavioral therapy (G-FS-CBT) for AUD
- G-FS-CBT was tested against an empirically-supported individual FS-CBT (I-FS-CBT)
- G-FS-CBT had high therapeutic adherence, alliance, patient engagement and satisfaction
- Positive drinking and psychosocial outcomes with no treatment condition differences.

Figure 1.
CONSORT figure showing participant recruitment and study flow.

Figure 2.
Drinking outcomes during treatment.

Figure 3.
Drinking outcomes post-treatment.

Figure 4.
Non-drinking outcomes and change in alliance with therapist during treatment.

Figure 5.
Non-drinking outcomes during 12 months post-treatment

Table 1.**Individual Female-Specific CBT (I-FS-CBT) and Group Female-Specific CBT (G-FS-CBT) Manual Content**

Session	Interventions
1	Feedback from assessment Treatment rationale, psycho-education on female AUD Introduction to self-recording Abstinence plan
2	Functional analysis: triggers and behavior chains
3	Problem-solving for presence of heavy drinkers in social network Self-management planning
4	Decisional matrix and motivation enhancement
5	Coping with anxiety and depression I Dealing with urges to drink
6	Coping with Anxiety and Depression II Emotion regulation
7	Dealing with alcohol-related thoughts Connecting with others: Improving social support for abstinence
8	Assertiveness Training Drink refusal training
9	Relapse prevention I: Seemingly Irrelevant Decisions Anger management
10	Relapse prevention II: Identifying and managing warning signs of relapse Problem-solving introduction and exercises
11	Handling slips and relapses
12	Final review and Maintenance planning Relapse contract

Note – Routine Interventions in every session: breathalyzer, overview of session (agenda setting), Review of self-recording and homework, Check in, Skills Rationale and Exercise (listed in Table), Plan for High Risk situations this week, Assign Homework

Table 2.**Sample Characteristics, and Treatment Engagement**

<i>Demographic Variables</i>	Full Sample (N=138)		G-FS-CBT (n=65)		I-FS-CBT (n=73)	
	M or %	(SD, n or Median)	M or %	(SD, n or Median)	M or %	(SD, n, or Median)
Age ¹ , M(SD) (range 19-75)	48.65	(11.76)	47.75	(12.98)	49.44	(10.58)
Married (%)	44.90%	(70)	36.90%	(60)	52.00%	(72)
Hispanic (any race)	9.42%	(13)	13.85%	(9)	5.48%	(4)
White	86.96%	(120)	89.23%	(58)	84.93%	(62)
Black or African American	8.70%	(12)	6.15%	(4)	10.96%	(8)
More than one race	4.35%	(6)	4.62%	(3)	4.11%	(3)
Bachelor's Degree or higher ²	30.00%	(42)	43.08%	(28)	49.32%	(36)
Employed (full or part time)	56.52%	(78)	58.46%	(38)	54.80%	(40)
Household income in dollars ³ , M (SD)	90,811	(106,511)	93,766	(135,154)	88,180	(73,037)
Any axis I disorder (past or current)	65.22%	(90)	66.15%	(43)	64.38%	(47)
Any axis I disorder (current)	39.13%	(54)	41.54%	(27)	36.99%	(27)
Any axis II disorder	14.49%	(20)	15.39%	(10)	13.70%	(10)
<i>Study Outcome Variables (at baseline)</i>	M	(SD)	M	(SD)	M	(SD)
Percentage of drinking days	65.27	(30.40)	63.25	(32.54)	66.98	(28.58)
Percentage of heavy drinking days	56.96	(31.67)	56.44	(32.98)	57.41	(30.74)
Mean drinks per drinking day	7.18	(4.60)	7.48	(4.97)	6.92	(4.28)
Coping skills	2.52	(0.48)	2.53	(0.47)	2.52	(0.50)
Self-efficacy	49.33	(23.51)	48.91	(24.04)	49.70	(23.18)
Depression	20.49	(11.02)	20.00	(10.77)	20.92	(11.29)
Anxiety	13.73	(11.69)	12.79	(11.05)	14.58	(12.25)
Autonomy	29.72	(6.21)	30.37	(6.34)	29.14	(6.08)
Sociotropy	33.42	(11.93)	34.91	(12.20)	32.10	(11.61)
Interpersonal Problems	38.34	(18.12)	37.75	(18.11)	38.86	(18.23)
Network abstinence/recovery	27.86	(21.24)	29.94	(23.00)	26.01	(19.50)
Network encouragement abstinence	72.39	(29.46)	73.59	(28.83)	71.34	(30.16)
<i>Treatment Engagement Variables</i>	M	(SD)	M	(SD)	M	(SD)
Number of sessions completed ^{***}	8.70	(3.75)	7.58	(3.61)	9.68	(3.61)
Number of weeks in treatment [*]	9.55	(4.36)	8.67	(4.59)	10.34	(4.02)
Percentage of homework completed	81.52	(20.73)	82.13	(19.86)	81.02	(21.54)
Treatment satisfaction	2.77	(0.58)	2.76	(0.63)	2.78	(0.55)
Working alliance (with therapist) ^{***}	67.97	(6.80)	65.98	(7.63)	69.43	(5.71)
Working alliance (with group)			65.21	(7.39)		

Note: P-values for treatment condition differences at baseline based on t-tests or logistic regression. G-FS-CBT = group female specific CBT. I-FS-CBT = individual female specific CBT.

¹ Median age is 50; 25% of sample was <=44.

²28% of the sample had a high diploma/GED or lower; 25% had 2 years college or vocational/technical certificate.

³Median household income is \$66,000. Household income for 25% of the sample is $\leq$ \$34,000.

 p .001

*
 $p < .05$

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Table 3.**Description of Group Therapist Behaviors and Group Process**

Group Therapist Behaviors¹ (Hamilton et al., 1993)	Mean	SD
Facilitation of interactions among group members	3.63	.97
Sensitivity to group members' level of participation	3.49	.82
Facilitation of a supportive group atmosphere	3.97	.66
Making group level observations	2.23	1.27
Focusing on "here and now" dynamics within the group	1.77	1.14
Working in depth with group members' feelings	3.11	.99
Initiation, addressing, or discussing group process	2.69	1.53
Group Environment Scale² (Moos, 2002)		
Cohesion	3.78	.58
Leader Support	3.83	.42
Expressiveness	2.79	.92
Independence	3.44	.71
Task Orientation	3.79	.47
Self-Discovery	3.76	.57
Anger and Aggression	0.56	.55
Order and Organization	3.84	.49
Leader Control	3.13	.85
Innovation	1.72	.93
Group Therapy Curative Elements¹ (Yalom & Leszcz, 2005)		
Altruism: Therapist facilitating	3.34	.80
Altruism: Group members exhibiting	3.74	.98
Group cohesiveness: Therapist facilitating	3.27	.94
Group cohesiveness: Group members exhibiting	3.83	.99
Universality: Therapist facilitating	3.49	1.01
Universality: Group members exhibiting	3.78	1.00
Interpersonal feedback: Therapist facilitating	3.31	.96
Interpersonal feedback: Group members exhibiting	3.31	1.18
Interpersonal learning: Therapist facilitating	2.43	1.17
Interpersonal learning: Group members exhibiting	2.54	1.20
Guidance: Therapist facilitating	3.54	.82
Guidance: Group members exhibiting	3.74	.95
Catharsis: Therapist facilitating	2.43	1.01
Catharsis: Group members exhibiting	2.69	1.08
Identification (imitative behavior): Therapist facilitating	2.34	1.19
Identification (imitative behavior): Group members exhibiting	2.43	1.29
Family reenactment: Therapist facilitating	1.66	1.16
Family reenactment: Group members exhibiting	1.57	1.09
Self-understanding: Therapist facilitating	2.71	1.02

Group Therapist Behaviors ¹ (Hamilton et al., 1993)	Mean	SD
Self-understanding: Group members exhibiting	2.60	1.06
Instillation of hope: Therapist facilitating	3.80	.72
Instillation of hope: Group members exhibiting	3.74	.89
Existential factors: Therapist facilitating	3.01	1.23
Existential factors: Group members exhibiting	2.94	1.28

¹Objective rater; (1=not at all; 2=a little; 3=somewhat; 4=considerably; 5=extensively).

²Participant self-report questionnaire, range 0-4.

Table 4.**Growth Curve Models for Drinking Outcomes (Within Treatment)**

		Est.	(SE)	t or z	p	random effect (SD)
Percentage of Drinking Days (PDD)	Intercept	20.59	(2.52)	8.16	<.001	27.57
	Baseline PDD	0.46	(0.07)	7.03	<.001	
	Treatment condition	9.25	(5.05)	1.83	.07	
	Time (weeks 1-6)	-4.78	(0.57)	-8.37	<.001	5.78
	Time (weeks 7-14)	0.04	(0.30)	0.12	.91	2.86
	Treatment condition x Time (weeks 1-6)	1.84	(1.14)	1.61	.11	
	Treatment condition x Time (weeks 7-14)	-0.14	(0.60)	-0.23	.82	
	Residual					14.83
Percentage of Heavy Drinking Days (PHDD)	Intercept	10.59	(1.93)	5.50	<.001	20.95
	Baseline PHDD	0.22	(0.05)	4.22	<.001	
	Treatment condition	3.46	(3.85)	0.90	.37	
	Time (weeks 1-6)	-2.40	(0.41)	-5.80	<.001	4.03
	Time (weeks 7-14)	0.08	(0.21)	0.38	.70	1.81
	Treatment condition x Time (weeks 1-6)	0.26	(0.83)	0.32	.75	
	Treatment condition x Time (weeks 7-14)	-0.05	(0.41)	-0.12	.91	
	Residual					12.09
Any Drinking (binary)	Intercept	-0.07	(0.38)	-0.18	.86	3.63
	Baseline PDD	0.05	(0.01)	4.49	<.001	
	Treatment condition	0.69	(0.76)	0.91	.36	
	Time (weeks 1-6)	-0.47	(0.08)	-6.35	<.001	0.24
	Time (weeks 7-14)	-0.09	(0.06)	-1.54	.13	0.40
	Treatment condition x Time (weeks 1-6)	0.30	(0.14)	2.18	.03	
	Treatment condition x Time (weeks 7-14)	0.12	(0.11)	1.02	.31	
	Residual					
Any Heavy Drinking (binary)	Intercept	-2.10	(0.42)	-4.97	<.001	3.52
	Baseline PHDD	0.03	(0.01)	3.77	<.001	
	Treatment condition	1.34	(0.75)	1.79	.07	
	Time (weeks 1-6)	-0.50	(0.08)	-6.22	<.001	0.36
	Time (weeks 7-14)	-0.14	(0.08)	-1.87	.06	0.33
	Treatment condition x Time (weeks 1-6)	0.29	(0.13)	2.16	.03	
	Treatment condition x Time (weeks 7-14)	-0.05	(0.11)	-0.45	.65	
	Residual					

Table 5.

Growth Curve Models for Drinking Outcomes (Post-Treatment)

		Est.	(SE)	<i>t</i> or <i>z</i>	<i>p</i>	random effect (SD)
Percentage of Drinking Days (PDD)	Intercept	31.28	(3.05)	10.24	<.001	32.52
	Baseline PDD	0.41	(0.09)	4.60	<.001	
	Treatment condition	9.91	(6.14)	1.61	.11	
	Time	0.12	(0.30)	0.39	.70	2.93
	Treatment condition x Time	-1.00	(0.59)	-1.70	.09	
	Residual					13.12
Percentage of Heavy Drinking Days (PHDD)	Intercept	17.89	(2.76)	6.47	<.001	29.44
	Baseline PHDD	0.21	(0.07)	3.01	.003	
	Treatment condition	4.86	(5.53)	0.88	.38	
	Time	-0.15	(0.28)	-0.54	.59	2.85
	Treatment condition x Time	-0.82	(0.57)	-1.44	.15	
	Residual					11.71
Any Drinking (binary)	Intercept	3.19	(0.96)	3.34	.001	5.59
	Baseline PDD	0.04	(0.02)	1.64	.10	
	Treatment condition	2.22	(1.28)	1.73	.08	
	Time	0.13	(0.13)	0.98	.33	0.77
	Treatment condition x Time	-0.29	(0.18)	-1.65	.10	
	Residual					
Any Heavy Drinking (binary)	Intercept	-0.70	(0.46)	-1.52	.13	3.97
	Baseline PHDD	0.00	(0.01)	-0.25	.80	
	Treatment condition	0.72	(0.90)	0.80	.43	
	Time	-0.09	(0.08)	-1.11	.27	0.61
	Treatment condition x Time	-0.18	(0.15)	-1.22	.22	
	Residual					

Table 6.

Growth Curve Models for Non-Drinking Outcomes (Within Treatment)

		Est.	(SE)	t or z	p	random effect (SD)
Depression	Intercept	9.96	(0.78)	12.78	<.001	8.22
	Baseline depression	6.26	(0.60)	10.53	<.001	
	Treatment condition	1.03	(1.56)	0.66	.51	
	Time (weeks 1-6)	-1.15	(0.14)	-8.00	<.001	1.28
	Time (weeks 7-14)	-0.12	(0.11)	-1.06	.29	0.86
	Treatment condition x Time (weeks 1-6)	0.27	(0.29)	0.96	.34	
	Treatment condition x Time (weeks 7-14)	0.03	(0.22)	0.16	.88	
	Residual					3.92
Anxiety	Intercept	7.41	(0.66)	11.27	<.001	6.28
	Baseline anxiety	4.85	(0.50)	9.81	<.001	
	Treatment condition	0.29	(1.32)	0.22	.83	
	Time (weeks 1-6)	-0.97	(0.14)	-7.16	<.001	0.91
	Time (weeks 7-14)	-0.29	(0.13)	-2.19	.03	0.99
	Treatment condition x Time (weeks 1-6)	0.18	(0.27)	0.66	.51	
	Treatment condition x Time (weeks 7-14)	0.13	(0.26)	0.50	.62	
	Residual					5.27
Coping Skills	Intercept	2.90	(0.04)	78.79	<.001	0.39
	Baseline coping skills	0.39	(0.02)	16.58	<.001	
	Treatment condition	0.04	(0.07)	0.57	.57	
	Time (weeks 1-6)	0.07	(0.01)	9.36	<.001	0.07
	Time (weeks 7-14)	0.02	(0.00)	5.46	<.001	0.03
	Treatment condition x Time (weeks 1-6)	0.00	(0.01)	-0.08	.94	
	Treatment condition x Time (weeks 7-14)	0.00	(0.01)	-0.44	.66	
	Residual					0.17
Self-Efficacy	Intercept	70.61	(1.93)	36.63	<.001	20.09
	Baseline self-efficacy	11.80	(1.19)	9.90	<.001	
	Treatment condition	2.42	(3.86)	0.63	.53	
	Time (weeks 1-6)	3.73	(0.41)	9.17	<.001	3.91
	Time (weeks 7-14)	0.97	(0.22)	4.50	<.001	1.44
	Treatment condition x Time (weeks 1-6)	0.79	(0.82)	0.97	.34	
	Treatment condition x Time (weeks 7-14)	-0.57	(0.43)	-1.31	.19	
	Residual					9.48
Autonomy	Intercept	30.17	(0.44)	69.10	<.001	4.46
	Baseline autonomy	4.28	(0.36)	12.04	<.001	
	Treatment condition	1.34	(0.88)	1.52	.13	
	Time (weeks 1-6)	0.27	(0.08)	3.28	.001	0.64
	Time (weeks 7-14)	0.14	(0.05)	2.88	.01	0.19
	Treatment condition x Time (weeks 1-6)	0.28	(0.16)	1.72	.09	

		Est.	(SE)	t or z	p	random effect (SD)
Sociotropy	Treatment condition x Time (weeks 7-14)	-0.13	(0.10)	-1.27	.21	
	Residual					2.78
	Intercept	29.20	(0.77)	38.12	<.001	8.13
	Baseline sociotropy	8.77	(0.57)	15.41	<.001	
	Treatment condition	-1.41	(1.54)	-0.92	.36	
	Time (weeks 1-6)	-0.46	(0.13)	-3.67	<.001	1.03
	Time (weeks 7-14)	-0.22	(0.09)	-2.34	.02	0.64
	Treatment condition x Time (weeks 1-6)	-0.19	(0.25)	-0.74	.46	
	Treatment condition x Time (weeks 7-14)	0.24	(0.19)	1.31	.19	
	Residual					3.92
Network Abstainers/ In Recovery	Intercept	36.11	(1.97)	18.31	<.001	19.74
	Baseline network abstainers/recovery	12.81	(1.59)	8.08	<.001	
	Treatment condition	-0.75	(3.96)	-0.19	.85	
	Time (weeks 1-6)	0.53	(0.35)	1.51	.13	2.17
	Time (weeks 7-14)	0.49	(0.31)	1.56	.12	2.12
	Treatment condition x Time (weeks 1-6)	0.64	(0.70)	0.91	.36	
	Treatment condition x Time (weeks 7-14)	0.38	(0.63)	0.61	.55	
	Residual					13.92
	Intercept	81.65	(2.29)	35.68	<.001	23.24
	Baseline network encouragement for abst.	7.98	(1.55)	5.15	<.001	
Network Encouragement for Abstinence	Treatment condition	8.79	(4.58)	1.92	.06	
	Time (weeks 1-6)	0.52	(0.44)	1.17	.24	3.59
	Time (weeks 7-14)	0.61	(0.31)	1.96	.05	2.05
	Treatment condition x Time (weeks 1-6)	0.13	(0.89)	0.15	.89	
	Treatment condition x Time (weeks 7-14)	-0.36	(0.62)	-0.58	.57	
	Residual					14.34
	Intercept	4.26	(0.14)	30.74	<.001	1.44
	Treatment condition	0.24	(0.28)	0.87	.39	
	Time (weeks 1-6)	0.08	(0.03)	3.32	.001	0.20
	Time (weeks 7-14)	0.01	(0.02)	0.50	.62	0.16
Self-Care Actions	Treatment condition x Time (weeks 1-6)	0.04	(0.05)	0.74	.46	
	Treatment condition x Time (weeks 7-14)	-0.02	(0.04)	-0.40	.69	
	Residual					0.81
	Intercept	67.95	(0.60)	114.05	<.001	6.51
	Treatment condition	-2.35	(1.19)	-1.97	.05	
	Time (weeks 1-6)	0.54	(0.10)	5.68	<.001	0.87
	Time (weeks 7-14)	0.13	(0.06)	2.30	.02	0.39
	Treatment condition x Time (weeks 1-6)	0.53	(0.19)	2.80	.01	
	Treatment condition x Time (weeks 7-14)	-0.07	(0.11)	-0.60	.55	
	Residual					2.56
Working Alliance (with therapist)	Intercept	65.66	(0.88)	74.90	<.001	6.41
	Treatment condition					
	Time (weeks 1-6)					
	Time (weeks 7-14)					
	Treatment condition x Time (weeks 1-6)					
	Treatment condition x Time (weeks 7-14)					
	Residual					
	Intercept					
	Treatment condition					
	Time (weeks 1-6)					
Working Alliance (with group)	Time (weeks 7-14)					
	Treatment condition x Time (weeks 1-6)					
	Treatment condition x Time (weeks 7-14)					
	Residual					
	Intercept					
	Treatment condition					
	Time (weeks 1-6)					
	Time (weeks 7-14)					
	Treatment condition x Time (weeks 1-6)					
	Treatment condition x Time (weeks 7-14)					

	Est.	(SE)	<i>t</i> or <i>z</i>	<i>p</i>	random effect (SD)
Time (weeks 1-6)	0.88	(0.15)	5.80	<.001	0.90
Time (weeks 7-14)	0.23	(0.11)	2.09	.04	0.52 3.08
Residual					3.08

Note – Interpersonal Problems (IIP32) results not shown here since IIP32 was administered only pre- and post-treatment, not at every session as others listed here were.

Table 7.

Growth Curve Models for Non-Drinking Outcomes (Post-Treatment)

		Est.	(SE)	t or z	p	random effect (SD)
Depression	Intercept	7.89	(0.68)	11.66	<.001	6.17
	Baseline depression	4.06	(0.63)	6.45	<.001	
	Treatment condition	1.58	(1.35)	1.17	.25	
	Time	0.09	(0.06)	1.49	.14	0.25
	Treatment condition x Time	−0.11	(0.12)	−0.95	.35	
	Residual					4.37
Anxiety	Intercept	5.68	(0.59)	9.60	<.001	4.48
	Baseline anxiety	3.26	(0.55)	5.96	<.001	
	Treatment condition	0.48	(1.18)	0.41	.69	
	Time	0.09	(0.06)	1.61	.11	0.05
	Treatment condition x Time	−0.10	(0.12)	−0.86	.39	
	Residual					5.00
Coping Skills	Intercept	3.04	(0.04)	77.07	<.001	0.38
	Baseline coping skills	0.27	(0.04)	7.75	<.001	
	Treatment condition	−0.05	(0.08)	−0.67	.50	
	Time	−0.01	(0.00)	−4.13	<.001	0.02
	Treatment condition x Time	0.01	(0.01)	1.23	.22	
	Residual					0.22
Self-Efficacy	Intercept	76.91	(1.98)	38.92	<.001	17.17
	Baseline self-efficacy	6.31	(1.80)	3.50	.001	
	Treatment condition	−6.58	(3.95)	−1.66	.10	
	Time	−0.51	(0.20)	−2.61	.01	1.07
	Treatment condition x Time	0.42	(0.39)	1.07	.29	
	Residual					14.09
Autonomy	Intercept	32.31	(0.47)	68.76	<.001	4.02
	Baseline autonomy	4.49	(0.44)	10.18	<.001	
	Treatment condition	−1.15	(0.95)	−1.21	.23	
	Time	−0.04	(0.04)	−1.04	.30	0.14
	Treatment condition x Time	0.11	(0.08)	1.26	.21	
	Residual					3.27
Sociotropy	Intercept	28.61	(0.85)	33.54	<.001	7.54
	Baseline sociotropy	9.54	(0.79)	12.11	<.001	
	Treatment condition	0.71	(1.71)	0.41	.68	
	Time	0.21	(0.08)	2.72	.01	0.34
	Treatment condition x Time	0.01	(0.15)	0.08	.94	
	Residual					5.60
Interpersonal Problems	Intercept	34.10	(1.28)	26.59	<.001	8.79
	Baseline IIP32	12.23	(1.17)	10.49	<.001	

		Est.	(SE)	t or z	p	random effect (SD)
	Treatment condition	-1.23	(2.56)	-0.48	.63	
	Time	-0.06	(0.14)	-0.43	.67	0.16
	Treatment condition x Time	0.17	(0.27)	0.63	.53	
	Residual					11.32
Network Abstainers/ In Recovery	Intercept	31.64	(1.41)	22.44	<.001	12.33
	Baseline network abstinent/in recovery	12.06	(1.37)	8.81	<.001	
	Treatment condition	2.31	(2.83)	0.82	.42	
	Time	-0.02	(0.13)	-0.17	.87	0.28
	Treatment condition x Time	-0.02	(0.25)	-0.07	.95	
	Residual					10.72
Network Encouragement for Abstinence	Intercept	77.19	(2.27)	34.01	<.001	12.65
	Baseline network encourage abstinence	7.02	(1.91)	3.67	<.001	
	Treatment condition	-0.39	(4.54)	-0.09	.93	
	Time	-1.09	(0.28)	-3.92	<.001	0.69
	Treatment condition x Time	0.22	(0.56)	0.39	.70	
	Residual					23.80
Self-Care Actions	Intercept	146.10	(2.25)	65.05	<.001	21.88
	Treatment condition	-4.86	(4.49)	-1.08	.28	
	Time	-1.39	(0.21)	-6.50	<.001	1.66
	Treatment condition x Time	0.76	(0.43)	1.78	.08	
	Residual					12.16