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Secondary Prevention of Alcohol Problems in Rural Areas Using a Bibliotherapy-Based Approach

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This study investigated the relative effects of 3 12-week secondary prevention interventions for problem drinking men and women in rural counties in New York State. The participants were 111 self-referred men and women without severe dependence on alcohol who nevertheless reported heavy drinking and a desire to reduce their alcohol consumption. They were assigned randomly to 1 of 3 12-week interventions focused on reducing alcohol intake: bibliotherapy (a self-directed manual) alone, bibliotherapy with 1 telephone-administered motivational interview, or bibliotherapy with 1 telephone-administered motivational interview and 6 biweekly telephone therapy sessions. Results showed that, across conditions, participants significantly increased their abstinent and light drinking days and significantly decreased their heavy drinking days over the course of treatment and a 12-month follow-up period. In addition, participants reported moderate reductions in alcohol consequences and increases in confidence not to drink heavily across a variety of situations from pre- to posttreatment, with these changes remaining stable across the course of the follow-up. Use of the drinking reduction strategies presented in the self-directed manual also remained stable from posttreatment to the 12-month follow-up. These results provide support for consideration of bibliotherapy for rural problem drinkers who are not severely dependent on alcohol, with or without the addition of telephone contacts.

Keywords: problem drinkers, rural, bibliotherapy, motivational interviewing, telephone therapy

Problematic use of alcohol is a significant public health concern. In the United States, data from the 2012–2013 National Epidemiological Survey on Alcohol and Related Conditions showed that the rates of 12-month and lifetime prevalence of alcohol use disorder (AUD) were 13.9% and 29.1%, respectively (Grant et al., 2015). With respect to urbanicity, the 12-month and lifetime AUD prevalence rates, respectively, were 14.9% and 29.2% for those classified as living in urban areas and 10.2% and 28.6% for those in rural areas. It is noteworthy that the AUDs in rural areas were predominantly of lesser severity. Over half of the 12-month rural AUD cases were classified as mild severity, suggesting the applicability of secondary prevention interventions.

AUD prevalence rates warrant a strong and vigorous response, and considerable progress has been made in the development of a variety of empirically supported prevention and treatment interventions. Application of many of

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these interventions, however, faces multiple challenges in rural environments. These include a shortage of substance abuse treatment services, transportation issues, and limited financial resources or insurance coverage (Rebhun & Hansen, 2001; Smalley et al., 2010). This has led to efforts to more efficiently and effectively target prevention and treatment interventions in rural areas, one of which is bibliotherapy.

Bibliotherapy has a long history of application to problem drinking and would appear particularly suited to intervening with problem drinkers living in rural areas. Bibliotherapy in this context has typically included self-directed books and manuals focused on reducing drinking and attendant risks. Lesser-severity problem drinkers have been shown to be particularly well suited for such a treatment approach (Apodaca & Miller, 2003; van Amsterdam & van den Brink, 2013). The usual treatment has been a package of behavioral self-control strategies (e.g., Miller & Munoz, 2013; Robertson & Heather, 1985) that includes self-monitoring, functional analysis of drinking behavior, stimulus control training, and strategies for modifying drinking behavior (e.g., sip rate, sip amount, preplanning drinking, setting drinking limits, interspersing alcoholic with nonalcoholic drinks, developing alternatives to drinking). These behavioral self-control packages consistently have yielded robust reductions in drinking that have been maintained over time (e.g., Connors & Walitzer, 2001; Heather et al., 1990; Miller, 1978; Sanchez-Craig et al., 1984). Taken together, these data support the proposition that this bibliotherapy-based intervention may be a particularly useful and effective intervention with this population of problem drinkers.

A second trend in the provision of clinical services in rural areas has been telehealth. Many strategies have been pursued under this broad heading, including telephone counseling, videoconferencing, and technology-based interventions, and their use has shown promising results (e.g., Benavides-Vaello, Strode, & Sheeran, 2013; Hilty et al., 2013; Lal & Adair, 2014). Telephone counseling, for example, has been used in the context of alcohol use concerns with generally positive results, although the literature overall is characterized by a variety of methodological limitations (Gates & Albertella, 2016). In a noteworthy study by Sanchez-Craig, Davila, and Cooper (1996), self-referred problem drinkers received a drinking-reduction self-help book by mail and either received or did not receive a 30-min assessment feedback/motivational interview session. Significantly more participants were classified as moderate drinkers in the feedback/motivational interview condition at 3-month follow-up, although at 12 months, participants were doing equally well.

The present study extends past research on secondary prevention interventions in its specific recruitment of rural problem drinkers without histories of severe dependence on alcohol. Furthermore, the study included a telephone counseling component. Each participant reported a desire to reduce his or her alcohol consumption. The 12-week drinking reduction intervention, which focused on reducing alcohol consumption, was administered through use of a self-directed manual that focused on self-awareness of drinking behavior, identifying danger signals regarding problematic drinking situations, developing strategies for reducing alcohol intake, and reducing the risks associated with drinking that does occur.

The participants were randomly assigned to one of three treatment conditions. In the first, participants received only bibliotherapy (i.e., were provided the self-directed manual). In the second, participants received bibliotherapy along with a telephone-administered motivational interview designed to foster enthusiasm and commitment for use of the self-directed manual. In the third, participants received bibliotherapy, the telephone-administered motivational interview, and six biweekly telephone therapy sessions that focused on the participant's progressive utilization of the self-directed manual and its ongoing application to his or her individual circumstances.

With the above literature as foundation, we hypothesized that all participants, regardless of treatment condition, would show significant increases in abstinent and light drinking days and significant decreases in heavy drinking days. Consistent with the hypothesized reduction in alcohol consumption, we expected that all participants would show significant decreases in alcohol problems. We also expected increases in participant confidence to not drink heavily in a variety of situations, based on the expectation that such confidence would emanate from the successful implementation of the drinking re-

duction strategies presented during treatment. Finally, we expected incremental benefits on each outcome variable to be associated with receipt of the motivational interview, given research indicating positive outcomes being associated with motivational interviewing interventions, and further benefit to be associated with receipt of the combined motivational interview and telephone therapy contacts, based on telephone therapy studies indicating a positive relationship between telephone therapy sessions and outcome.

Method

Participants

The participants were recruited from New York State counties designed as "rural," based on the Beale code continuum developed by the U.S. Department of Agriculture (Hewitt, 1989). In terms of population, the counties averaged 41,400 residents and the average density (population per square mile) was 54.1 (range = 3–107; median = 61). (The average county density for the state overall was 381.0 [range = 3–53,971; median = 123]). The recruitment occurred via notices and display advertisements in local newspapers and radio advertisements that contained the program's toll-free telephone number. For each incoming call, project staff conducted a computer-assisted telephone interview that included a series of questions designed to determine initial eligibility status. Potentially eligible participants were mailed a questionnaire packet to gather additional information relevant to determining eligibility. The mailing also included a written, informed-consent document for the participant to read and sign. Upon receipt of the completed questionnaire packet and signed informed-consent document, a pretreatment interview was scheduled for participants meeting full inclusion criteria.

The initial telephone screening and the subsequent pretreatment interview assessed multiple inclusion and exclusion criteria. The inclusion criteria included self-referral, age 21 or older, 8th grade education or greater, having a telephone, a desire to reduce alcohol consumption (as opposed to a desire to abstain), and living in a rural New York State county. The exclusion criteria were geared toward identifying problem drinkers not appropriate for a drinking reduction goal: history of hospitalization for alcoholism or detoxification from any substance, an alcohol-related arrest in the prior year or multiple lifetime arrests, concurrent alcohol-related treatment or therapy, scoring in the upper 2 quartiles of the Alcohol Dependence Scale (Skinner & Allen, 1982), and currently abstaining from drinking. Furthermore, individuals were excluded in cases where there were pending charges for an alcohol-related arrest, current dependence on other drugs, medication use that contraindicated alcohol consumption, and (among women) pregnancy or attempting to become pregnant. Individuals excluded from participation were referred to abstinence-based treatment resources.

The resultant sample was comprised of 111 participants (61 women, 50 men). Demographically, they averaged 46.99 years (SD = 11.79) of age and 15.54 years (SD = 2.70) of education; 60% were married, 23% separated or divorced, 14% single, and 4% widowed. Most were employed full time (69%) or part time (8%). Four percent were unemployed, and the remainder were students (2%), homemakers (2%), or retired (12%). The majority were White (97%) or African American (1%). Their average monthly drinking during the 6-month pretreatment period was 7 days abstinent, 7 days engaged in light drinking (1–3 standard drinks), 12 days engaged in moderate drinking (4–6 standard drinks), and 3 days of heavy drinking (>6 standard drinks). There were no significant differences among the three treatment conditions on any of these baseline variables.

Procedure

Participants were assigned to treatment condition using two levels of urn randomization (Stout et al., 1994; Wei, 1978) designed to avoid bias and ensure group equivalence along several important dimensions. First, participant gender was balanced across therapist gender. Second, participant gender, therapist gender, and alcohol dependence severity were balanced across the three treatment conditions. Chi-square analyses showed no differences in the proportional allocations.

Treatments

Bibliotherapy (BT). Participants in this condition received a 122-page self-directed manual with a 12-week schedule instructing participants as to the pace they should work through the manual. The manual was a revised edition of Robertson and Heather's (1985) *So You Want to Cut Down Your Drinking? A Self-Help Guide to Sensible Drinking*. Originally developed for use in Scotland, the manual was revised for use with a North American population (e.g., revision of colloquialisms and measurement metrics). It focused on self-awareness of drinking behavior, identifying danger signals regarding problem drinking situations, developing strategies for reducing alcohol intake, and reducing risks associated with drinking that does occur (see Table 1).

Bibliotherapy and motivational interview (BT/MI). In this condition, participants received the self-directed manual and also participated in a telephone motivational interview that occurred within 1 day of the participant's receipt of the manual. The 60-min semistructured interview used techniques described by Miller and his colleagues (e.g., Miller & Rollnick, 2013; Miller, Zweben, DiClemente, & Rychtarik, 1992). The goal of the interview was to build motivation for drinking reduction, and if the participant already seemed committed to reduction, to strengthen that commitment.

Bibliotherapy, motivational interview, and telephone therapy (BT/MI/TT). In this third condition, participants received the self-directed manual, participated in a telephone motivational interview, and received six biweekly telephone therapy contacts. These 50-min telephone therapy contacts occurred at 2, 4, 6, 8, 10, and 12 weeks after receipt of the manual and the telephone motivational interview. These structured contacts included (1) a review of drinking and any alcohol-related consequences for the previous 2 weeks, (2) the participant's utilization and questions regarding the sections of the manual scheduled for the previous 2 weeks, and (3) a brief overview of the material scheduled for the next 2 weeks.

Therapists

Three licensed master's-level therapists experienced in the treatment of alcohol problems (two women, one man) conducted the motiva-

Table 1
Bibliotherapy Self-Directed Manual Contents and Schedule

Week	Part	Description
1 & 2	Part 1: Who is this book for? How do I use this book?	Introduction. Discussion of negative alcohol consequences.
	Part 2: Why should I cut down?	Standard drink unit. Retrospective report of a typical week's drinking. Discussion of "safe" drinking limits and habits. Negative alcohol consequences self-report. Identification of reasons to moderate drinking. Self-contract to reduce drinking.
3 & 4	Part 3: How does alcohol affect me?	Alcohol education (metabolism, elimination, behavioral effects, blood alcohol content, tolerance). Alcohol education quizzes.
	Part 4: Why do I drink?	Identification of personal motivations for drinking. Discussion of 15 common reasons for drinking.
5 & 6	Part 5: How can I cut down?	Daily self-monitoring of drinking. Identification of risky circumstances (exercise and identification). Development of drinking rules. Identifying a daily limit. Slowing down drinking (11 strategies).
7 & 8	Part 5: How can I cut down? (continued)	Rewards (material rewards, mental rewards, using a partner, charting progress). More strategies for reduction. Identification of preferred strategies for reduction. Abstinent days.
9 & 10	Part 6: Be all you can be.	Anxiety reduction (deep breathing, progressive muscle relaxation). Physical activity. Social networks. Reducing boredom. Brainstorming exercise to identify alternative activities to drinking. Improving confidence and assertion skills. Coping with bereavement, marital problems, sexual difficulties, insomnia, and/or unemployment. Coping with craving alcohol. Improving problem-solving skills.
11 & 12	Part 7: A look backward and forward.	Relapse prevention. Maintenance. Reevaluation of drinking rules.

tional interviews and telephone treatment sessions. Participants were assigned to therapists for the treatments according to the urn randomization procedures described above. The therapists were trained on the conduct of the motivational interview techniques and telephone treatment sessions via seminars, treatment manuals, modeling, and role playing. Treatment manuals were developed to guide the respective sessions. Group supervision and review of session audiotapes of the telephone motivational interview and treatment sessions occurred weekly.

Assessments

Alcohol consumption. The Timeline Follow-Back interview (Sobell & Sobell, 1992, 1996) is a calendar-based retrospective recall interview of daily alcohol use. It was used to assess daily alcohol consumption throughout the 6 months prior to treatment, the 12-week treatment period, and the 6-month periods assessed during the 6- and 12-month follow-up assessments. The reports provided by the participants were used to classify their drinking on any given day as abstinent or engaged in light (1–3 standard drinks), moderate (4–6 standard drinks), or heavy (>6 standard drinks) drinking. The drinking variables of central interest in the present study were the monthly numbers of (a) abstinent and light drinking days combined and (b) heavy drinking days.

Alcohol consequences. The Drinker Inventory of Consequences (DrInC; Miller, Tonigan, & Longabaugh, 1995) is a 45-item measure tapping negative consequences of alcohol use. At pretreatment, the reporting window was the 6 months prior to the interview. The DrInC was administered at pretreatment, end of treatment, and 6- and 12-months posttreatment.

Alcohol dependence. The Alcohol Dependence Scale (ADS; Skinner & Allen, 1982) is 29-item questionnaire assessing an individual's history of alcohol dependence. The ADS was administered at pretreatment to assess severity of alcohol dependence.

Situational confidence. The Situational Confidence Questionnaire (SCQ; Annis, 1986) assesses current confidence for not drinking heavily in a variety of situations. The SCQ was administered at pretreatment, end of treatment, and 6- and 12-months posttreatment.

Self-Directed Manual Strategy Use. This 12-item measure, developed for use in this study, was used to gather reports from participants on the extent to which they had been using the techniques presented in the manual to reduce drinking (e.g., self-monitoring of drinking, setting drinking rules and limits, identifying high-risk drinking situations). The measure was administered at the end of treatment and at the 6- and 12-month posttreatment assessments.

Analysis Plan

We first calculated pre- to posttreatment paired Cohen's *d* effect sizes to provide the magnitude and direction of the treatment effects for each of our study variables for all three conditions. Cohen (1988) recommended cutoffs of .2, .5, and .8 for small, medium, and large effects, respectively.

To examine participants' response to treatment, we ran a series of latent growth curve models (LGCMs; Curran & Hussong, 2003) using Mplus (version 7.2; L. K. Muthén & Muthén, 1998–2012). LGCMs are constructed in a structural equation modeling framework where a latent intercept and slope are derived from repeated measures of observed variables. The latent intercept variables reflect the initial level of growth curve. In the current analyses, the intercept represented the intake value for all constructs (i.e., abstinent and light drinking days, heavy drinking days, alcohol consequences, and situational confidence), apart from the strategy use variable, which was not measured until the first posttreatment assessment. Thus, the intercept for the strategy use items represents the level of the growth curve at the first posttreatment assessment. The latent slope was created to reflect the rate of change in the constructs examined across the 12 months of data collection. In the current analyses we chose to fit linear growth models to the data.

There were a few statistical considerations we needed to address when running LGCMs. First, because there are three treatment conditions, we created dummy codes to examine treatment effects on the rate of change and to test for initial differences among treatment conditions. Second, three of our primary outcomes were not normally distributed (i.e., abstinent and light drinking days, heavy drinking days, and alcohol consequences). The alcohol conse-

quences variables were amenable to a square root transformation. The abstinent and light drinking days variables and the heavy drinking days variables had ceiling and floor effects, respectively. These variables were most appropriately modeled in the LGCMs as censored from above or below, accordingly. Censored variables are semicontinuous with a portion of responses equal to a single value (e.g., the floor or ceiling value) and a continuous, often skewed, distribution among the remaining values (Olsen & Schafer, 2001). Censored regression can be thought of as a two-part regression model with a probability of giving a response at the censored value and a conditional linear model for the mean response given it is nonzero (Olsen & Schafer, 2001). Censored regression models have long been applied to alcohol use data (cf. Hansen & Graham, 1991).

LGCMs were estimated using full-information maximum likelihood (FIML). Schafer and Graham (2002) recognized FIML as a best-practice strategy for modeling missing data. For LGCMs that included censored variables we utilized maximum likelihood estimation with robust standard errors and chi-square (MLR). The MLR estimator is recommended over the default maximum likelihood estimator when data are both missing at random and nonnormally distributed (Enders, 2001; B. Muthén, & Asparouhov, 2002; Schafer & Graham, 2002). Overall model fit for models with normally distributed variables was evaluated following recommendations by Hu and Bentler (1999). Specifically, we chose to focus on the comparative fit index (CFI; Bentler, 1990) and the standardized root-mean residual (SRMR; Bentler, 1995). Hu and Bentler (1999) recommended cutoff values close to .95 for CFI and values close to .08 for SRMR. Overall model fit is not available for LGCMs run with censored variables. MLR with censored variables relies on raw data rather than means, variances, and covariances, which precludes the estimation of typical tests of overall model fit (Simons, Wills, & Neal, 2014).

Results

Descriptive Data and Preliminary Analyses

Table 2 presents pretreatment drinking and baseline SCQ and DrInC data, by treatment condition. (Strategy use was not assessed at baseline so it was not included in Table 2). At each assessment point, participants were asked if they had participated (since the last assessment) in four alcohol-related sources of intervention: Alcoholics Anonymous (AA)/self-help meetings, outpatient counseling, hospital treatment, and detoxification. Twelve individuals reported use of any such services during the study. Four participants reported only attending AA/self-help meetings (one at posttreatment and at each follow-up and three at only one of the follow-ups). Four reported only contact with a counselor (three at posttreatment and one at 9-month follow-up). Three reported involvement with both a counselor and AA/self-help meetings (one reported both at posttreatment, one reported both at posttreatment and at 3-month follow-up, and one reported counseling at posttreatment and AA/self-help meeting attendance at 9-month follow-up). One participant reported detoxification and hospital treatment at 6-month follow-up and AA/self-help meeting attendance at 12-month follow-up. Finally, study retention was excellent, based on the availability of data on drinking behavior through the 12-month follow-up (BT = 95%; BT/MI = 100%; BT/MI/TT = 97%).

Pretreatment to Posttreatment Changes

Effect sizes (i.e., paired Cohen's *d*) for pre- to posttreatment changes are presented below. Note that we were unable to calculate pre- to posttreatment changes in the strategy use variable because it was not assessed at pretreatment, as participants had not yet been exposed to the strategies.

Bibliotherapy. The BT group had medium-sized increases in abstinent and light drinking days from pre- to posttreatment ($d = .59$). They had minimal decreases in heavy drinking days ($d = -.16$). In addition, the BT group had medium-sized decreases in alcohol consequences ($d = -.53$) and minimal increases in situational confidence to avoid heavy drinking ($d = .14$).

Bibliotherapy/motivational interview. The BT/MI group had large increases in abstinent and light drinking days from pre- to posttreatment ($d = .88$). They had medium-sized decreases in heavy drinking days ($d = -.59$). In addition, the BT/MI group had minimal de-

Table 2
Descriptive Data by Condition

Variable	BT		BT/MI		BT/MI/TT	
	M	*SD*	*M*	*SD*	*M*	*SD*
Abstinent days						
Baseline	7.46	6.69	8.03	8.59	6.28	6.95
Posttreatment	11.36	8.65	11.98	9.08	10.03	8.62
6-month	13.25	9.40	15.57	9.16	13.11	9.99
12-month	12.98	9.31	15.44	10.21	12.96	10.59
Light drinking days						
Baseline	8.63	8.90	4.76	6.17	8.09	9.74
Posttreatment	9.99	9.99	8.84	8.48	10.48	9.63
6-month	9.28	9.55	9.23	8.70	12.03	10.96
12-month	10.99	10.51	8.21	8.76	9.90	10.67
Moderate drinking days						
Baseline	12.06	9.49	12.96	10.41	10.86	10.09
Posttreatment	7.32	7.87	7.65	9.05	7.25	7.95
6-month	6.52	7.19	3.25	4.67	3.61	6.35
12-month	5.35	6.82	5.81	8.13	5.05	8.38
Heavy drinking days						
Baseline	1.63	2.99	3.30	4.93	3.50	6.26
Posttreatment	1.29	3.31	1.14	2.60	1.05	2.18
6-month	.79	2.04	1.66	5.08	1.08	4.63
12-month	.65	1.94	0.44	1.51	1.04	2.67
Situational Confidence Questionnaire						
Baseline	67.91	18.19	66.46	23.04	58.80	16.41
Posttreatment	70.47	19.29	71.10	21.24	73.38	16.97
6-month	76.22	16.91	71.77	23.58	71.18	19.48
12-month	73.23	18.57	70.46	23.90	68.80	20.30
DrInC						
Baseline	16.89	9.42	18.84	13.90	18.53	9.90
Posttreatment	12.22	8.28	16.58	15.22	14.72	11.55
6-month	9.73	7.46	15.68	15.64	13.04	9.23
12-month	10.94	9.88	12.41	13.82	10.68	8.66

Note. For each category of daily drinking, figures represent the mean number of days per month, averaged across the 6-month pretreatment baseline period. BT = bibliotherapy; BT/MI = bibliotherapy/motivational interview; BT/MI/TT = bibliotherapy/motivational interview/telephone therapy; DrInC = Drinker Inventory of Consequences.

creases in alcohol consequences ($d = -.16$) and small increases in situational confidence to avoid heavy drinking ($d = .21$).

Bibliotherapy/motivational interview/telephone therapy. The BT/MI/TT group had medium-sized increases in abstinent and light drinking days from pre- to posttreatment ($d = .63$). They had small decreases in heavy drinking days ($d = -.36$). In addition, the BT/MI/TT group had small decreases in alcohol consequences ($d = -.35$) and large increases in situational confidence to avoid drinking ($d = .87$).

Latent Growth-Curve Models Describing Change Over Time

Figure 1 presents changes in abstinent and light drinking days (upper panel) and heavy drinking days (lower panel) over the course of the study, by treatment condition.

Overall model fit. Overall model fit was not available for the LGCMs examining changes in abstinent and light drinking days, or heavy drinking days because of the censored distribution of the data. The fit indices for the

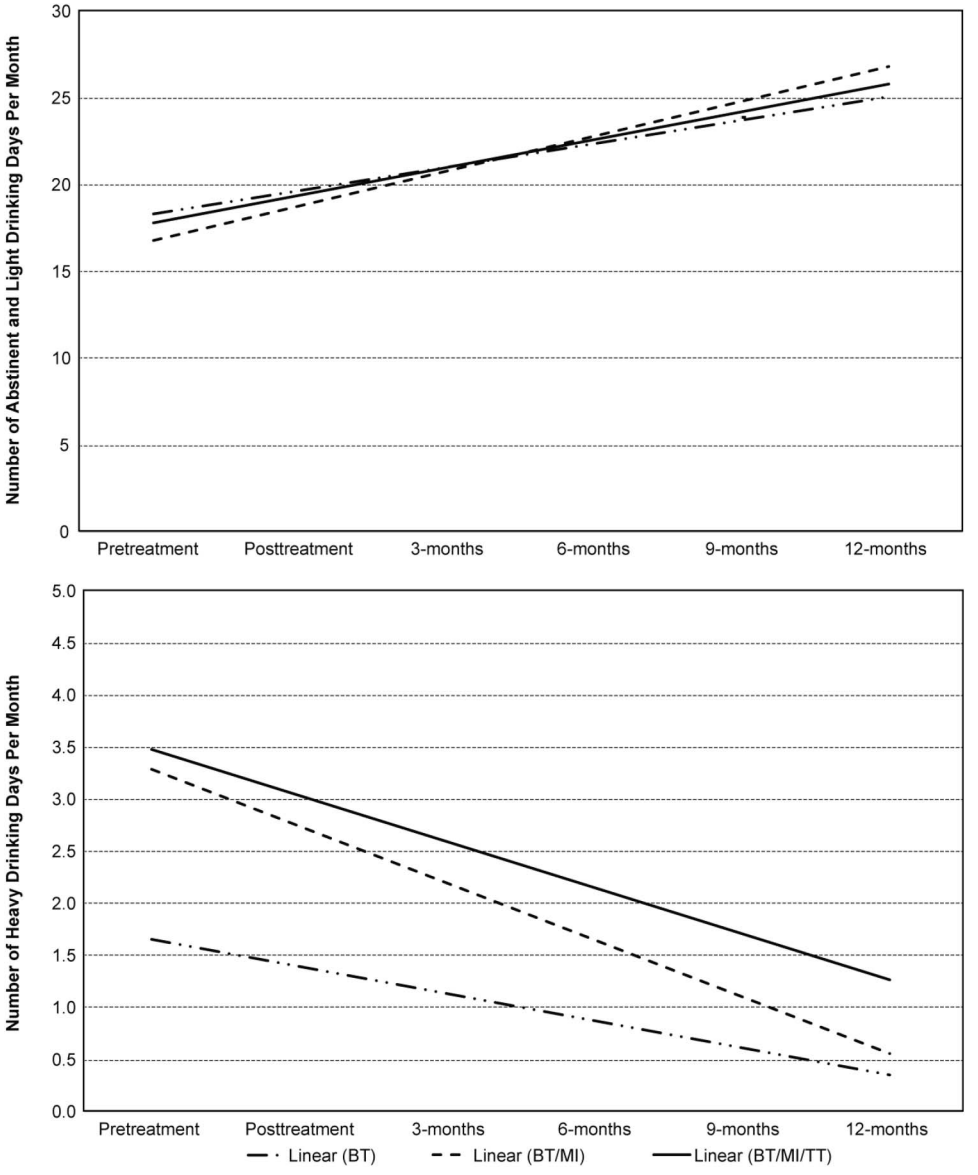

Figure 1. Changes in abstinent and light drinking days (top panel) and changes in heavy drinking days (bottom panel) over time from pretreatment to 12-months' posttreatment. The specific data points are available from the authors. BT = bibliotherapy; BT/MI = bibliotherapy/motivational interview; BT/MI/TT = bibliotherapy/motivational interview/telephone therapy.

LGCMs examining changes in alcohol consequences and strategy use over the course of the study were excellent (alcohol consequences: CFI = .96, SRMR = .06; strategy use: CFI = 1.00, SRMR = .02), and was acceptable for changes in situational confidence for avoiding heavy drinking (CFI = .87, SRMR = .05).

Intercept and slope. The intercept and slope parameter estimates, standard errors, and *p* values are presented in Table 3. All intercepts

Table 3
Latent Growth Curve Model Intercept and Slope Estimates

Variable	Intercept			Slope		
	Estimate	*SE*	*p*	Estimate	*SE*	*p*
Abstinent and light drinking days	18.24	1.62	<.001	2.36	0.57	<.001
Heavy drinking days	1.55	1.17	.19	−1.41	0.35	<.001
DrInC	3.59	0.39	<.001	−1.02	0.81	.21
Situational Confidence Questionnaire	69.49	3.65	<.001	0.52	0.57	.36
Strategy use	5.09	0.25	<.001	−0.10	0.11	.39

Note. DrInC = Drinker Inventory of Consequences.

were positive and statistically significant, with the exception of heavy drinking days, which was positive but not statistically significant. Interpretation of the intercepts reveals that participants reported 18.24 abstinent and light drinking days, 1.55 heavy drinking days, a score of 12.89 on the alcohol consequences scale (note that since alcohol consequences was square-root transformed, the estimate reported in Table 3 was squared for purposes of interpretation), high levels of situational confidence, and moderate levels of strategy use at the first assessment. The slopes for heavy drinking days, alcohol consequences, and strategy use were negative, but only the slope for heavy drinking days was statistically significant. This suggests that although heavy drinking days reduced over the course of the study, alcohol consequences and strategy use remained stable. The slopes for abstinent and light drinking days and situational confidence were positive, but only the slope for abstinent and light drinking days was significant. This indicates that participants increased abstinent and light drinking days over the course of the study, but situational confidence remained stable.

Treatment condition. Treatment condition did not predict either the intercept or slope parameters in any of the models. This suggests that the treatment groups reported similar levels of abstinent and light days, heavy drinking days, alcohol consequences, situational confidence, and strategy use.

Discussion

The rural problem-drinking men and women in this study overall exhibited medium-sized increases in abstinent and light drinking days and small-sized decreases in heavy drinking days from before to after participation in these secondary prevention intervention conditions focused on drinking reduction. Furthermore, these changes in drinking continued to improve over the course of a 12-month follow-up period. Specifically, participants continued to increase abstinent and light days and decrease heavy days linearly across the 12-month follow-up period.

These reductions are consistent with previous research showing that secondary prevention interventions with persons not severely dependent on alcohol can be beneficially applied in service of reducing alcohol consumption (e.g., Apodaca & Miller, 2003; van Amsterdam & van den Brink, 2013), including to persons living in rural areas. Comparison of the effect sizes found in the present study with those reported in other studies on bibliotherapy for problem drinkers is not straightforward. In the present study, effect sizes for pre- to posttreatment increases in abstinent and light drinking days ranged from medium to large (i.e., .59 to .88), with a mean of .70. For purposes of comparison, a large effect size (i.e., $M = .80$) was reported in a review of eight bibliotherapy studies with problem drinkers, although the effect sizes in those studies were based on reduction in volume of alcohol consumed (Apodaca & Miller, 2003). It is noteworthy that the effect sizes found in the present study are larger than those typically found for therapist-guided interventions presented via the Internet, which in one review averaged .23, again based on reductions in alcohol consumption, and is in the small range (Riper et al., 2014).

In addition to changes in drinking behavior, participants reported moderate reductions in alcohol consequences and increases in confidence not to drink heavily across a variety of situa-

tions from pre- to posttreatment. These posttreatment levels for consequences and confidence remained stable across the course of the study. Use of the drinking reduction strategies also remained stable from posttreatment to the 12-month follow-up.

The results did not suggest that the addition of a telephone motivational interview or a telephone motivational interview combined with biweekly telephone sessions over the 12-week intervention period overall provided further benefit to the participants. For each outcome variable assessed, the initial levels and changes across time did not vary as a function of the respective treatment conditions. Indeed, participants who only received the self-directed manual did as well as those who, in addition, received the treatment enhancements. It is not known why the enhancements did not provide the anticipated additional benefit. Perhaps the most plausible reason is that this group of self-referred individuals, responding to an advertisement for the project and initiating the process of their participation, already were sufficiently engaged and motivated to pursue the process of changing their drinking through use of the self-directed manual. This would be consistent with past research on the use of bibliotherapy interventions with problem drinkers that has shown benefit (Apodaca & Miller, 2003). It as well is possible that there is limited benefit of this telehealth approach for drinking reduction interventions in the present population.

There are several limitations associated with this research that should be highlighted. First, the men and women participating in this study presented with positive prognostic characteristics, including being well educated, socially stable, and not severely dependent on alcohol. It is not known how generalizable these results would be to rural populations with greater severity or lower levels of overall life-functioning. Second, as noted earlier, the participants were self-referred and as such likely brought a level of motivation that might not be present among other populations of rural problem drinkers. Third, although the therapists were trained and supervised in the conduct of the motivational interview, the study did not include a formal coding system, such as the Motivational Interviewing Treatment Integrity (Moyers et al., 2005), to measure treatment fidelity. Finally, for ethical reasons the project did not include a no-treatment control group. The absence of such a comparison group precludes attributing the increases in abstinent and light drinking days and the reduction in heavy drinking days to the drinking reduction self-directed manual.

Taken together, these results showed that participants markedly increased their abstinent and light drinking days and decreased their heavy drinking days over the course of treatment and a 12-month follow-up period. In addition, pre- to posttreatment gains in alcohol consequences and situational confidence were maintained across the follow-up period, and the use of drinking reduction strategies remained stable across the follow-up period. The findings provide support for consideration of bibliotherapy for rural problem drinkers who are not severely dependent on alcohol, with or without the addition of telephone contacts. Future research might productively pursue the extent to which this self-directed manual or comparable content might be equally effective when made available through emerging technologies. Indications are promising, for example, for the effectiveness of such applications being presented through mobile devices (Gonzalez & Dulin, 2015; Meredith, Alessi, & Petry, 2015; Quanbeck, Chih, Isham, & Gustafson, 2014).

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