A Primary Care “Friendly” Cognitive Behavioral Insomnia Therapy

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INTRODUCTION

CHRONIC INSOMNIA IS A WIDESPREAD HEALTH PROBLEM THAT REDUCES QUALITY OF LIFE, increases risks for psychiatric/medical disease, and enhances healthcare costs for countless millions worldwide. Over the past three decades, a variety of alternative insomnia therapies have become available. Of these, cognitive-behavioral therapy (CBT) has emerged as, perhaps, the most promising and broadly applicable insomnia treatment. Several well-controlled efficacy trials have shown CBT to be superior to pharmacotherapy, relaxation therapy, medication placebo, or sham (placebo) behavioral therapy for producing enduring sleep improvements among well-screened patients with sleep onset and sleep maintenance complaints. Subsequent clinical effectiveness studies conducted with ‘real-world’ patients have suggested CBT is an effective insomnia treatment for general medical practice patients, chronic pain sufferers, and patients with comorbid medical and psychiatric conditions. Despite such findings, CBT remains largely underutilized in primary care, perhaps due to both real and presumed barriers present in such venues. Heavily burdened primary care physicians are likely to find the 6- to 8-session CBT models described in the literature as far too time-consuming and burdensome to both themselves and their patients. As a consequence, it is likely that many such practitioners may mistakenly view treatments such as CBT far less cost-effective than pharmacotherapy despite the diminishing returns often achieved with the latter form of treatment. In addition, some survey data suggest that insomnia patients may prefer medication-free alternative therapies to address their chronic sleep difficulties. This latter report suggests that brief, albeit effective, CBT protocols for insomnia could be developed to suit the needs of a variety of primary care settings. The purpose of the current study was to test the effectiveness of a 2-session CBT protocol specifically modeled for such venues. We hypothesized that our abbreviated CBT (ACBT) would produce greater improvements in subjective sleep appraisals, insomnia-related symptoms, sleep-related self-efficacy, and dysfunctional beliefs about sleep than would a similarly brief intervention including only generic sleep hygiene suggestions (SHC).

Objectives: This study was conducted to test the effectiveness of an abbreviated cognitive-behavioral insomnia therapy (ACBT) with primary care patients.

Design: A single-blind, randomized group design was used in which study patients were randomized to either a brief, 2-session ACBT or a similarly brief intervention (SHC) that included only generic sleep hygiene recommendations.

Setting: A university-affiliated Department of Veterans Affairs medical center.

Participants: Twenty (2 women) veteran patients (Mage = 51.0 yrs., SD = 13.7 years) who met criteria for chronic primary insomnia.

Measurements and Results: Participants completed sleep logs for 2 weeks and questionnaires to measures insomnia symptoms, sleep-related self-efficacy, and dysfunctional beliefs about sleep before treatment, during a 2-week posttreatment assessment, and again at a 3-month posttreatment follow-up. Statistical analyses showed that ACBT produced significantly larger improvements across a majority of outcome measures than did SHC. Case-by-case analyses showed that only the ACBT produced consistent positive effects across study patients, and a sizeable proportion of these patients receiving this treatment achieved clinically significant improvements by their study endpoints. Approximately 52% of those receiving the ACBT reported at least a 50% reduction in their wake time after sleep onset, and 55.6% of ACBT-treated patients who entered the study with pathologic scores on an Insomnia Symptom Questionnaire (ISQ), achieved normal ISQ scores by their final outcome assessment.

Conclusions: ACBT is effective for reducing subjective sleep disturbance and insomnia symptoms in primary care patients.

Key Words: Cognitive-behavioral therapy; sleep hygiene; primary insomnia; primary care

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METHOD

Study Design

This study used a single-blind, randomized group design. Each patient enrolled in the study was randomly assigned either to an ACBT or to a contact control treatment that included only very basic SHC. All study participants were kept blind to the study hypotheses, but they were told that the purpose of the study was to compare brief, medication-free treatments for insomnia. The institutional review board of our VA medical center approved the study protocol, and all study patients provided written informed consent at the time of their enrollment.

Participants

Study participants were all outpatients enrolled in the primary care clinics at the Durham Veterans Administration Medical Center. Study candidates were recruited between January 1, 1999, and December 31, 2000, from physician referrals as well as through study announcements posted at various locations within the medical center and mailed to 741 VA patients residing within the city of Durham, NC. To be considered for inclusion in the study, each candidate had to: (1) provide written informed consent; (2) have a ≥ 1 month history of difficulty initiating and/or maintaining sleep; and (3) meet DSM-IV criteria for primary insomnia on the basis of a structured interview for sleep disorders38 devised by the first author. Excluded from the study were individuals who had: (1) a history of a sleep-disruptive comorbid medical condition (e.g., chronic pain syndromes); (2) a terminal illness; (3) a documented history or active symptoms of any type of parasomnia; (4) a history or active symptoms of such primary sleep disorders as obstructive sleep apnea, restless legs syndrome, periodic limb movement disorder, circadian rhythm sleep disorder or any type of parasomnia; (4) a history or active symptoms of a comorbid Axis I psychiatric disorder listed in the DSM-IV;38 and (5) current use of sedative hypnotics or alcohol as sleep aids. Of the 32 physician- and 7 self-referral prospective study participants, 18 men and 2 women met study selection criteria and eventually were randomized to treatment conditions. The mean age of this sample was 51.0 years (SD = 13.7 years). Fifteen of the enrollees were Caucasians and the remaining 5 were African Americans. Twelve of the 20 patients reported histories of one or more chronic medical problems. The specific medical problems reported included hypertension (n = 5), hearing loss/tinnitus (n = 3), gastroesophageal reflux disease (n = 2), low back pain (n = 2), ulcerative colitis (n = 1), asthma (n = 1), and chronic fatigue syndrome (n = 1). In addition, 6 patients reported past or present psychiatric conditions including major depression in remission (n = 2) and combat-related posttraumatic stress disorder (n = 4). Only 7 patients reported no chronic comorbid medical or psychiatric conditions at the time of their study entry.

Measures

Sleep Logs. Subjective sleep changes were derived from sleep logs that participants completed during a 2-week pretreatment assessment, a 2-week posttreatment assessment, and a 2-week follow-up conducted 3 months after the end of treatment. Logs were designed so that a week’s worth of sleep data could be recorded on each sleep log form. For each 24-hour period, the respondent completed questions about the time of retiring to and arising from bed, as well as questions designed to obtain the respondent’s estimates of sleep onset latency (SOL), number of nocturnal awakenings, and wake time after sleep onset (WASO) for each night of sleep. In addition, the log contained Likert-style items that allowed respondents to rate the perceived quality (1 = extremely poor, 5 = excellent) of each night’s sleep as well as how well rested (1 = not at all rested, 5 = extremely well rested) they felt upon arising each day. Target subjective outcome measures derived from these logs included the estimates of total sleep time (TST), SOL, WASO, sleep efficiency (SE), and both the sleep quality and restedness ratings.

Insomnia Symptom Questionnaire. An Insomnia Symptom Questionnaire (ISQ), completed by participants at baseline, during a 2-week posttreatment assessment, and again 3 months after treatment, was used to assess treatment-related changes in global subjective insomnia symptoms. This instrument, developed by Spelman et al.,40 contains 13 items designed to assess respondents’ perceptions about their daytime functioning and nighttime sleep. As used herein, each ISQ item was accompanied by a 100-mm visual analog scale (i.e., horizontal line) labeled “not at all” at its left extreme and “frequently” at its right extreme. Respondents were instructed to draw a vertical line through the point on each item’s analog scale (i.e., 100-mm line) to indicate their response. The distance from the left end of the line to the response line served as an analog measure of the degree to which the respondent had the symptom noted by the item. The average score across the 13 items represented the respondent’s overall ISQ score for each administration. Internal consistency for this measure in the current sample was acceptable, with Cronbach’s coefficient α = .83 based on the ISQs administered before treatment.

Self-Efficacy Scale. The 9-item Self-Efficacy Scale41 (SES) was administered at the same time points as the other questionnaires to assess treatment-related changes in patients’ perceived control over their sleep. The SES items include 100-mm visual analog scales labeled “Not at all [confident]” at their left extremes and “Very [confident]” at their right extremes. The items were all answered and scored in a manner similar to that described for the above questionnaire with the average score of all SES items serving as the final score for each administration. Cronbach’s coefficient alpha for the pretreatment administration demonstrated acceptable internal reliability for the measure (α = .86).

Dysfunctional Beliefs and Attitudes About Sleep Scale. The 28-item Dysfunctional Beliefs and Attitudes About Sleep questionnaire (DBAS), administered to participants with the other questionnaires at the pretreatment, posttreatment, and follow-up time points, was used to assess treatment-related changes in sleep-related cognitions. This instrument, developed by Morin,42 is designed to assess misconceptions about the effects of insomnia, the unpredictability of sleep, daily sleep requirements, the causes of insomnia, and sleep-promoting habits. Like the ISQ and SES items, each DBAS item is accompanied by a 100-mm visual analog scale that the respondent uses to indicate degree of agreement with the item content. Scoring of DBAS items is accomplished in a manner similar to the method used to score the ISQ and SES, with the average of all DBAS items serving as the total DBAS score. Individual item to total DBAS score correlations conducted with the pretreatment DBAS questionnaires suggested highly acceptable internal consistency for this instrument (α = .86).

Treatment Credibility. Treatment credibility was assessed via responses (Likert ratings) to the 7-item Treatment Evaluation Questionnaire (TEQ).43 The TEQ’s first 5 questions assess perceived logic of and confidence in a treatment, willingness to repeat the treatment, likelihood the treatment will help others, etc. The final 2 items assess therapist warmth and competence. As noted in our previous work,27 the TEQ has acceptable internal consistency (α = .79). In the current project, participants completed the initial 5 TEQ items after their first treatment session and all 7 items after their second session.

Therapist and Treatments

One male (age 29) beginning-level clinical psychologist (WSS) served as the therapist for all study patients. This therapist had previously received some training and supervision in behavioral sleep medicine from the first author during the course of a predoctoral psychology internship training year spent at the study site (i.e., VA medical center). Before treating any of the participants in the current project, the therapist was required to review the project’s treatment manual outlining the treatment protocols and to discuss any questions about treatment delivery with the first author. Once he began treating enrolled study patients, he was provided supervision sessions by the first author, gener-
ally on a monthly basis. These supervision sessions were used to address the therapist’s questions concerning treatment implementation and to ensure that the therapist continued to adhere to treatment protocols throughout the study.

Treatment for all study patients was provided in two 25-minute meetings with the study therapist as well as via some take-home materials provided during the first treatment session. Take-home materials for both treatment conditions included a pamphlet summarizing the treatment’s behavioral recommendations and an audiocassette tape containing treatment-specific educational information. The two treatment sessions for each of the treatment conditions were scheduled at 2-week intervals. The first session of the ACBT intervention consisted of a review of initial sleep logs, the provision of a sleep education, and instruction in a condensed behavioral regimen to follow. Review of sleep logs included an estimate of the individual’s sleep efficiency, a summary of bedtime habits (e.g., television watching, reading, planning, worrying, etc.), and an estimate of time spent napping. The bedtime and rising time of the participant were graphed to provide the participant with a visual representation of the variability of his sleep/wake habits. Sleep education consisted of brief discussions of individual differences in sleep needs, the effects of aging on sleep, and the influences of sleep drive and circadian rhythms on sleep. The therapist presented this information verbally during the session and each ACBT patient was provided an audiocassette tape reiterating this information for use at home. The condensed behavioral regimen consisted of a combination of stimulus control and sleep restriction strategies and included instructions to: (1) eliminate sleep-incompatible activities (television watching, reading, planning, and worrying) in the bed and bedroom; (2) avoid all daytime napping; and (3) follow a consistent sleep-wake schedule by adhering to agreed-upon bed and rising times. For each ACBT patient, bed and rising times were negotiated after first determining the average sleep time (AST) the patient reported during the 2-week sleep-log monitoring. Each participant was allowed to select his or her standardized bed and rising times as long as the time interval between these two times equaled his or her pretreatment AST +30 minutes. At the end of the first ACBT session, the patient was given a pamphlet outlining the information described in the session and noting the bed and rising times discussed with the therapist. The participant’s overall sleep strategy was then modified to address any problems encountered since the first treatment session, and instructions to encourage future independent trouble-shooting were provided.

The participants in the SHC group received 2 treatment sessions that were similar in length to those provided to ACBT recipients. During the first SHC session, sleep logs were reviewed without problem-solving or graphing sleep-wake times. Generic sleep education consisting of descriptions of sleep stages, normal sleep architecture, and sleep cycles was then provided. As was the case in the ACBT condition, the therapist presented this information verbally during the session, and each SHC patient was provided an audiocassette tape reiterating this information for use at home. After receiving this educational information, participants were given a series of recommendations including eliminating caffeine and alcohol, engaging in moderate exercise, having a light snack before bed, and keeping their bedroom at a comfortable temperature and illumination level. These recommendations were applied to the participant’s own circumstances in detail, such as planning a particular snack or scheduling regular times during the week for walking or other exercise. SHC patients were encouraged to follow their primary care doctor’s instructions regarding medication prescriptions, document sleep behavior on the sleep log forms for 2 weeks, and return to the clinic for the second session. During the second SHC session, the generic sleep hygiene recommendations were again reviewed and treatment adherence problems were addressed with therapist assistance.

Procedure

All physician- and self-referral study candidates first met individually with the second author who provided a thorough study description and then solicited their written informed consent to participate. Those who granted consent then underwent a structured interview to ascertain the nature of their sleep complaint, and their hospital medical files were reviewed to determine their appropriateness for the study. Any study candidate who declined to participate or who met exclusion criteria was referred back to his or her primary care physician for treatment, and any diagnostic information that might have been helpful to the physician was forwarded. Consenting candidates who met selection criteria were asked to complete the pretreatment battery of outcome questionnaires as well as 2 weeks of sleep log monitoring. Subsequently they were randomized to treatment conditions and provided treatment as described above. Throughout the 2-week treatment phase and during the 2 weeks after treatment, each participant was asked to maintain sleep log records of her/his nightly sleep patterns. After the 2 weeks of posttreatment sleep log monitoring, each participant was asked to again complete the battery of outcome questionnaires. Three months later, the patient was asked to return and again complete this questionnaire battery and another 2 weeks of sleep log monitoring for final follow-up purposes.

RESULTS

Treatment Credibility

Participants’ responses to both administrations of the TEQ were used to compare the perceived credibility of the two treatment conditions. A series of one-way ANOVAs were conducted to perform these comparisons. The group comparisons conducted using item responses to the first TEQ administration showed that study patients rated the two treatments as equally logical, acceptable, and likely to be effective. The two treatment groups did not differ in their willingness to recommend their respective treatments to a friend, but the SHC group reported a greater likelihood that their treatment would be effective for others than did the CBT group (F1,16 = 4.74, p = .045). However, group comparisons based on responses to the TEQ administration following the second treatment session showed no differences between the two groups in regard to their ratings of treatment credibility or therapist warmth and competence. These findings, in general, suggest that the two treatments did not differ in regard to their credibility nor in regard to the nature in which they were delivered by the study therapist.

Baseline Comparisons

Prior to comparing the effectiveness of the two treatments, a series of ANOVAs were conducted to compare the treatment groups in regard to pretreatment values of the various outcome measures. Results of these comparisons along with group means and standard deviations are presented in Table 1. These data show that individuals composing both treatment groups entered the study with significant subjective sleep deficits and insomnia symptoms, but the groups did not differ significantly from each other on any of these measures prior to treatment. However, visual comparisons of the group means in Table 1 imply that the ACBT group had slightly more severe pretreatment sleep difficulties on average than did the SHC group. Given the small sample size and consequent limited statistical power for detecting pretreatment differences, this observation seemed noteworthy, particularly since initial insomnia severity has been shown to predict the final treatment endpoints achieved in response to CBT.44 Hence, for a majority of the subsequently described tests of treatment-induced changes, we chose to use...
analyses of covariance (ANCOVAs) to statistically adjust for pretreatment group differences on the various outcome measures.

Treatment Completion vs. Drop-outs

All but one of the study patients completed both treatment sessions, with the lone treatment dropout occurring in the SHC group. In addition to this treatment dropout, 1 patient in the ACBT group and 2 additional patients in the SHC group failed to complete the follow-up assessment. Given the resulting missing data, we performed treatment group comparisons for all dependent measures employing conservative intention-to-treat analyses using the end-point data obtained from all study participants.

Sleep Log Changes

To reduce the risk of Type I error, we first conducted a 2 (ACBT vs. SHC) x 3 (pretreatment vs. posttreatment vs. follow-up) x 6 (sleep log measures) MANOVA so as to detect overall treatment effects. Results of this analysis showed a significant treatment group x time x sleep measure interaction (F(4,180) = 4.72, p = 0.0001). Given this finding, we conducted a series of group x time univariate tests to compare the treatment groups on each of the sleep log measures. Each of these univariate tests consisted of a 2 (group) x 2 (posttreatment vs. follow-up) analysis of covariance (ANCOVA) in which the pretreatment value of the sleep log measure served as the covariate. This statistical method was chosen over both simple repeated measures ANOVA and change-score comparisons since the ANCOVA model employed provides appropriate type I error protection and superior power regardless of the size of pretreatment differences observed.45,46

Table 2 shows the adjusted group means, pooled standard error terms, and results of the ANCOVAs conducted to detect treatment group differences. For each sleep log measure, the adjusted pretreatment mean shown is the common pretreatment mean “assigned” by the ANCOVA to both treatment groups after adjusting for pretreatment differences in “raw” unadjusted values of that measure. The various treatment group means shown in Table 2 for the posttreatment and follow-up time points are also ANCOVA adjusted values and reflect residualized changes45,47 achieved by each treatment relative to the adjusted pretreatment values. These data show that the ACBT group achieved greater reductions in WASO and greater increases in SE and sleep quality than did the SHC group. In the case of these measures, group differences were noted at the posttreatment and follow-up time points, and there was no significant group x time effect observed. Furthermore, it should be noted that the positive changes in WASO and SE shown by the ACBT group were accompanied by an increase in sleep time even though time in bed restriction was included as an active treatment component for this group. These data also showed a significant group x time interaction was obtained in the analysis of participants’ ratings of how well rested they felt from sleep. Although the groups did not differ on this measure at the posttreatment time point, the ACBT patients indicated that they felt significantly more rested from their sleep than did the SHC patients at the follow-up time point. Thus, the sleep log measures suggested the ACBT was more effective than the SHC for producing subjective sleep improvements.

Outcome Questionnaires

Outcome questionnaires were obtained from all study patients except 1 of the SHC patients who failed to complete either baseline or post-treatment administrations of these measures. Accordingly, group comparisons conducted with the questionnaire data included 10 ACBT and 9 SHC patients. As was the case with the sleep log data, the questionnaire data were first subjected to an omnibus 2 (group) x 3 (time) x 3 (questionnaire scores) MANOVA. This analysis showed a significant (F(4,65) = 11.70, p = 0.0001) group x time x measure interaction. Given this interaction effect, we conducted a series of group x time univariate tests to compare the treatment groups on each of the three questionnaires. Each univariate test consisted of a 2 (group) x 2 (posttreatment vs. follow-up) analyses of covariance (ANCOVA) in which the pretreatment score of the respective questionnaire served as a covariate. Table 3 provides descriptive statistics and ANCOVA results for these questionnaire data. These results show that the ACBT group showed greater reductions in their subjective insomnia symptoms (ISQ scores) than did the SHC patients at both the posttreatment and follow-up time points. The ACBT group reported a greater sense of sleep-related self-efficacy than did the SHC group by the 3-month follow-up. Furthermore, the ACBT group showed progressive improvements (reductions) in their dysfunctional beliefs about sleep whereas the SHC group did not. Post-hoc tests suggested that the significant group x time interaction observed for the DBAS measure was attributable to the more marked differences between the treatment groups at follow-up than at the posttreatment time point. Overall, the questionnaire data dovetail with the sleep log data and suggest that ACBT produced larger improvements in patients’ global insomnia symptoms, their sense of control over sleep, and their sleep-related cognitions than did the equally credible SHC therapy.

**Table 1**—Pre-treatment comparisons of the two treatment groups.

<table>
<thead>
<tr>
<th>Measure</th>
<th>ACBT Mean</th>
<th>SD</th>
<th>SHC Mean</th>
<th>SD</th>
<th>F =</th>
<th>p =</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log – TST</td>
<td>332.5</td>
<td>66.4</td>
<td>348.7</td>
<td>46.8</td>
<td>1.04</td>
<td>0.32</td>
</tr>
<tr>
<td>Log – SOL</td>
<td>45.5</td>
<td>24.8</td>
<td>32.4</td>
<td>20.6</td>
<td>1.60</td>
<td>0.22</td>
</tr>
<tr>
<td>Log – WASO</td>
<td>111.8</td>
<td>52.1</td>
<td>82.5</td>
<td>44.7</td>
<td>1.82</td>
<td>0.19</td>
</tr>
<tr>
<td>Log – SE %</td>
<td>67.8</td>
<td>10.0</td>
<td>75.0</td>
<td>7.2</td>
<td>3.47</td>
<td>0.08</td>
</tr>
<tr>
<td>Log – Quality</td>
<td>2.22</td>
<td>0.66</td>
<td>2.20</td>
<td>0.78</td>
<td>0.01</td>
<td>0.94</td>
</tr>
<tr>
<td>Log – Restedness</td>
<td>1.99</td>
<td>0.52</td>
<td>1.78</td>
<td>0.60</td>
<td>0.73</td>
<td>0.41</td>
</tr>
<tr>
<td>ISQ – total score</td>
<td>58.1</td>
<td>13.4</td>
<td>63.6</td>
<td>17.4</td>
<td>0.60</td>
<td>0.45</td>
</tr>
<tr>
<td>SES – total score</td>
<td>33.0</td>
<td>21.5</td>
<td>39.6</td>
<td>13.3</td>
<td>0.60</td>
<td>0.44</td>
</tr>
<tr>
<td>DBAS – total score</td>
<td>44.7</td>
<td>12.7</td>
<td>45.1</td>
<td>15.5</td>
<td>0.00</td>
<td>0.95</td>
</tr>
</tbody>
</table>

Note: ACBT = abbreviated cognitive-behavioral insomnia therapy; SHC = sleep hygiene control treatment; TST, total sleep time; SOL, sleep-onset latency; WASO, wake after sleep onset; SE, sleep efficiency; ISQ = Insomnia Symptom Questionnaire; SES = Self-Efficacy Scale; DBAS = Dysfunctional Beliefs and Attitudes About Sleep Questionnaire.
Of course, in evaluating the clinical significance of treatment results it is equally important to assess the degree of improvement that a treatment produces. In this regard, we and others have suggested that clinically significant improvement might consist of: (1) 50% pre-to-post-treatment reductions in values of SOL and/or WASO; (2) averaged treatment endpoint scores on a measure such as the ISQ. For the purpose of the current study, we used a combination of these clinical improvement criteria. For all patients who entered the trial with an average SOL > 30 minutes per night, those who reported a mean SOL of < 30 minutes at the follow-up time point were regarded as having achieved clinically significant improvement in SOL. For patients who entered the trial with an average WASO > 30 minutes per night, those who reported a mean WASO of < 30 minutes at the follow-up time point were regarded as having achieved clinically significant improvement in WASO. Similarly, our previous study showed that the ACBT protocol produced a 52% reduction in WASO from study entry to the 3-month posttreatment follow-up time point. Thus, this initial study provided rather promising results in regard to our ACBT intervention.

To fully evaluate our ACBT’s efficacy, it seems useful to compare the current study’s findings with results obtained from our previous research using a more extended 6-session CBT protocol. In our previous double-blind, randomized trial we found that a 6-session CBT intervention, on average, produced a 54% reduction in WASO. In the current study, our ACBT-treated patients averaged a 52% reduction in WASO from study entry to the 3-month posttreatment follow-up time point. Similarly, our previous study showed...
that the average CBT-treated patient reached normative levels of both TST > 6 hours per night and SE > 85% per night by the study endpoint. In the current trial, the average ACBT-treated patient achieved slightly more than 6 hours of sleep each night and a SE of approximately 83%. Finally, our previous trial showed that about 59% of those CBT-treated patients who entered treatment with a pathologic ISQ score achieved a normal score by their study completion. In the current trial, 55.6% of the ACBT-treated patients with pathologic ISQ scores at study entry achieved normal scores on this measure by their study endpoint. Given the multitude of sample and methodologic differences between our previous study and the current one, these comparisons can provide only a crude indication as to how well our ACBT might compare to a more extensive CBT regimen. Nonetheless, these comparisons provide encouragement for further tests of ACBT among primary care patients.

In reviewing our findings, it seems important to consider this study's limitations. We view our ACBT as usable by non-psychologists with the mix of insomnia patients encountered in primary care settings. Admittedly we have yet to confirm this assumption, since our study sample was small, only patients meeting interview criteria for primary insomnia were enrolled, and a Ph.D.-level clinical psychologist administered all treatments. Our use of a single, non-blinded therapist may also raise some concerns in that this individual could have unconsciously, albeit systematically, delivered ACBT with more enthusiasm thus exaggerating this treatment’s effects. However, data acquired from the TEQ reduces this concern since the treatment groups did not differ in their ratings of the therapist's warmth and competence in treatment delivery. In addition, it should be noted that our study patients did not undergo objective sleep tests (e.g., polysomnography) either to rule out sleep pathology (e.g., sleep apnea) or to document their subjective improvements. Nonetheless, our previous study showed good concordance between sleep log and objective polysomnographic measures of sleep improvements, so we suspect that the subjective measures used herein provided a reasonable appraisal of treatment outcomes. Finally, whereas treatment credibility ratings and patients' self-reports led us to expect good treatment compliance across study participants, we did not include any systematic appraisals of patients' treatment compliance. Given these various considerations, future studies of this nature would benefit by: (1) use of large, more diverse insomnia patient samples; (2) use of multiple primary care providers (physicians, office nurses) as therapists; (3) polysomnographic screening of all study enrollees; (4) the inclusion of both objective and subjective outcome measures; and (5) incorporation of methods to systematically track treatment compliance.

REFERENCES


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