

Who is at risk for dropout from group cognitive-behavior therapy for insomnia?

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Abstract

Objective: The aim of the present study was to identify characteristics of patients who are at risk for dropout from a seven-session group cognitive-behavior therapy for insomnia (CBT-I) in a clinical setting using the receiver operating characteristic curve (ROC) approach. **Methods:** Two separate ROC analyses were conducted using predictor variables taken from questionnaire packets and sleep diaries collected at baseline including age, gender, Beck Depression Inventory (BDI), Morningness–Eveningness Questionnaire, Beliefs and Attitudes about Sleep, use of sleep medication, sleep onset latency, wake time after sleep onset, and total sleep time (TST). **Results:** The first ROC analysis was conducted on the entire sample of 528 patients with treatment completion vs. dropout (noncompletion) as the outcome variable. No significant predictor variables were

found in this analysis. The second ROC analysis was conducted on the 211 patients who did not complete treatment with early termination (prior to fourth session) vs. late termination (at or after fourth session) as the outcome variable. The results revealed that patients who reported an average baseline TST <3.65 h were at greatest risk for early termination. Sixty percent of patients in this group terminated early compared to 9.3% of patients with TST \geq 3.65 h. Among patients with TST \geq 3.65 h, 22% of those with BDI scores \geq 16 were early dropouts compared to 4.3% of those who reported BDI <16. **Conclusion:** These findings indicate that short sleep duration and elevated symptoms of depression at baseline are associated with increased risk of early termination from CBT-I.

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Introduction

Chronic insomnia is a prevalent problem with approximately 33% of American adults reporting at least one nighttime symptom of insomnia occurring every night or nearly every night during the past year [1]. Cognitive-behavior therapy for insomnia (CBT-I), a multicomponent treatment package that includes stimulus control, sleep restriction, relaxation exercises, and cognitive restructuring techniques, has demonstrated efficacy for the treatment of

insomnia (e.g., Refs. [2–5]). Meta-analyses have reported large effect sizes for reducing sleep onset latency (SOL) and improving sleep quality and medium effect sizes for reducing wake time after sleep onset (WASO) and increasing total sleep time (TST) [6–9]. In addition, treatment outcome studies have found that CBT-I is superior to pharmacological treatment in maintaining these benefits beyond the termination of treatment [3–5]. The accumulated evidence has led the American Academy of Sleep Medicine to recommend CBT-I as a standard treatment for chronic insomnia [10].

Despite the strong evidence supporting the efficacy of CBT-I, little is known about factors related to attrition during treatment. Early treatment outcome studies were inconsistent in reporting attrition, thus making it difficult to estimate the rate of dropouts. The recommendations outlined in the CONSORT statement [11] have improved the reporting of

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patient flow in randomized clinical trials (RCTs) and more recent RCTs using individual or group CBT-I for primary insomnia have revealed very low rates of dropout for participants in the CBT-I condition, ranging from 0% to 8% [2–5]. However, RCTs typically recruit homogenous samples, most commonly limited to patients with primary insomnia. These studies employ rigorous protocols that closely monitor attendance and use other active strategies to minimize attrition, thus rendering it difficult to generalize these findings to clinical settings, which often do not allocate resources for patient retention.

Indeed, studies conducted in clinical settings have reported much higher dropout rates. Two effectiveness studies examining a six-session group CBT-I in clinical settings reported noncompletion rates of 13.7% [12] and 34.0% [13] in the CBT-I groups. Studies using a case replication series of patients presenting to sleep clinics for CBT-I have reported a wide range of noncompletion rates, from 9.7% to 38.8% [14–18]. One factor that has been problematic in identifying dropout rates has been the inconsistency in operationalizing the term *dropout*. Some studies have reported dropout rates based on early termination or those who drop out prior to receiving an adequate dose of treatment. When a minimum adequate dose of treatment was defined as attending at least four sessions of CBT-I, early termination rates of 9.7% have been reported for group CBT-I [17] and 30.3% to 38.8% for individual CBT-I [14,18]. In contrast, other studies have reported dropout rates based on noncompletion or the failure to complete the treatment protocol regardless of when termination occurred. These studies have reported noncompletion rates of 13.7% to 34.0% for group CBT-I [12,13,16] and 30.0% for individual CBT-I [15]. Clearly, the dropout rate is considerably higher in clinical settings compared to RCTs, and the rate varies depending on the timing of termination from CBT-I. Therefore, identifying characteristics of clinic patients who drop out of treatment, especially early dropouts, could lead to improvements in the care these patients receive.

Currently, very little is known about risk factors that predict patient dropout. Some evidence suggests that the severity of sleep disturbance is related to withdrawal from treatment but the findings are inconsistent. Perlis et al. [18] found that patients who terminated from treatment prior to the fourth session reported a greater number of awakenings and less TST at baseline relative to those who completed treatment. In contrast, Morgan et al. [13] found that noncompleters reported less severe symptoms of sleep disturbance at baseline, as measured by the Pittsburgh Sleep Quality Index, compared to treatment completers. Treatment process variables have also been examined in the context of attrition. Pretreatment ratings of the acceptability of psychological treatment have been reported to be lower among noncompleters compared to completers of behavioral treatment [16]. A recent study examining therapeutic elements in group CBT-I found that patients who dropped

out prior to the fourth session perceived their therapist as more critically confrontive during the first session compared to patients who continued in treatment [19]. Although these studies provide preliminary insights, further research examining predictors of dropout among a set of clinically relevant variables would be particularly useful.

The receiver operating characteristic curve (ROC) is one analytic strategy that is well suited for identifying predictors or characteristics of those who are at risk for a particular dichotomous outcome, such as dropout from treatment. ROC utilizes a signal detection technique that can be used to evaluate the sensitivity and specificity of medical tests or to simultaneously evaluate a set of variables for the prediction of a binary outcome [20]. Unlike linear models that require a priori entry of interactions to detect these effects, ROC can provide information about interactions among variables using an ROC tree that identifies subgroups based on cutoff scores. This hypothesis-generating technique has been used in other naturalistic studies using large samples with a specific set of predictor variables (e.g., Refs. [21–24]). Using the ROC approach to identify predictors of dropout from CBT-I may yield important clinical information about patients who do not stay in treatment.

The aim of the present study was to identify characteristics of patients who are at risk for dropout from group CBT-I using a set of variables collected in a clinical setting. The ROC approach was employed because of its suitability for conducting exploratory analyses on a number of predictors for a binary outcome such as completion vs. dropout from treatment. The set of predictor variables selected in this study are clinically relevant and commonly collected during the course of behavioral treatments for insomnia, among which several measures were recommended as standard measures for the assessment of insomnia in research settings [25]. To address previous discrepancies between noncompleters and early dropouts, two separate ROC analyses were conducted. First, the ROC analysis was conducted on the entire sample to examine predictors of completers vs. dropouts of treatment. A second ROC analysis was conducted on the subgroup of noncompleters to examine predictors of early vs. late dropouts. By exploring data collected from clinic patients, these analyses serve to generate hypotheses that can lead to further investigations aimed at improving the delivery of CBT-I.

Method

Participants

The present study was conducted using archival data collected from a series of 528 patients who attended a CBT-I group program between March 1999 and May 2004 at the Stanford Sleep Disorders Clinic. The average age of patients was 47.9 years (S.D.=14.3 years) and 57.8% of the sample were female. The study was approved by the

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