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CLINICAL REVIEW

Self-help cognitive-behavioral therapy for insomnia: A meta-analysis of randomized controlled trials

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SUMMARY

Self-help cognitive-behavioral therapy (CBT) is an increasingly popular treatment option for insomnia. The objective of this meta-analysis was to compile an up-to-date evaluation on the efficacy, adherence, acceptability and dropout rate of self-help CBT for insomnia. We systematically searched six key electronic databases up until May 2013. Two researchers independently selected relevant publications, extracted data, and evaluated methodological quality according to the Cochrane criteria. Twenty randomized controlled trials were included; 10 of which were published after the last review up until January 2007. Meta-analysis of self-help CBT vs. waiting-list, routine care or no treatment was performed. Results showed that self-help CBT improved sleep, sleep-related cognitions and anxiety and depressive symptoms. Effect sizes for sleep-diary-derived sleep efficiency, sleep onset latency, and wake after sleep onset at immediate posttreatment were 0.80, 0.66, and 0.55, respectively. The average dropout rate of self-help CBT at immediate posttreatment was 14.5%, which was not significantly different from the 16.7% in therapist-administered CBT. Subgroup analyses supported the added benefit of telephone consultation. In conclusion, self-help CBT is efficacious and acceptable as an entry level of a stepped care model for insomnia. In places where face-to-face treatments are unavailable or too costly, self-help CBT can be considered as a compromise.

Introduction

Insomnia is the most common sleep complaint, with approximately 6–15% of the general population worldwide suffering from insomnia symptoms accompanied by daytime consequences [1]. Insomnia is associated with impairment in cognitive, social and emotional functioning [2] and is a risk factor of suicide, anxiety and depressive disorders, alcohol and substance abuse, decreased immune functioning and cardiovascular disease [3]. From an economic perspective, insomnia places a tremendous burden on individuals and society. A study showed that the direct and indirect cost of insomnia in Canada in the year 2007 was estimated at $6.6 billion and $975.6 billion, respectively, equivalent to an average annual per-person cost of $5010 for individuals with insomnia syndrome [4].

Pharmacological treatments such as benzodiazepines, non-benzodiazepines and antidepressants are widely prescribed for insomnia, but their use is limited by concern regarding long-term efficacy and potential for abuse, dependence and adverse effects [5]. Psychological and behavioral therapies of insomnia including relaxation training, paradoxical intention, stimulus control, sleep restriction and cognitive therapy are supported by empirical evidence [6]. Among these treatments for insomnia, multi-component cognitive-behavioral therapy (CBT), which aims at changing dysfunctional cognitions and maladaptive behaviors associated with the maintenance of insomnia, is a better-researched treatment modality [7]. A study showed that CBT was beneficial for approximately 75% of participants with chronic primary insomnia and reduced sleep onset latency and wake time after sleep onset by 50% on average [8]. According to a systematic review, CBT and pharmacotherapy were found to have comparable efficacy for short-term treatment of insomnia, but further improvement was only detected in the CBT group [9]. Furthermore, participants with insomnia reported greater acceptance of CBT than of pharmacological

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Abbreviations

CBT	cognitive-behavioral therapy
CI	confidence intervals
CONSORT	consolidated standards of reporting trials
DSM-IV	diagnostic and statistical manual of mental disorders, fourth edition
DSM-5	diagnostic and statistical manual of mental disorders, fifth edition
ICD-10	international classification of diseases, tenth revision
ICSD	international classification of sleep disorders
ISI	insomnia severity index
RCT	randomized controlled trial
SE	sleep efficiency
SOL	sleep onset latency
TST	total sleep time
WASO	wake after sleep onset

treatment [8,10]. Therefore, CBT seems to be a better choice for the treatment of insomnia; however, it has remained underutilized, perhaps due to the low availability of CBT services [11]. Faced with the limitation, recent studies have explored providing CBT in a self-help approach using booklet [12], videotape [13], audiotape [14] or the internet [15]. Preliminary findings indicated that self-help CBT for insomnia is comparable to face-to-face treatment and it has the benefits of low cost and convenience of access [12,16]. A stepped care model has been proposed as a solution to the high demand of CBT services for insomnia and self-help CBT is recommended as the least restrictive evidence-based entry step of the treatment model [17].

A systematic review on self-help therapy for insomnia was conducted a few years ago [18]. The authors concluded that self-help intervention was efficacious for treating insomnia and its efficacy was similar to that of face-to-face treatments, but they acknowledged that the effect size of self-help intervention might be overestimated due to publication bias. An updated review is therefore warranted as a large number of relevant studies have been published since the last search up to January 2007. Another systematic review was also published recently, evaluating computer- or internet-based self-help CBT [19]. Internet-based intervention has a potential to reach a large number of people. The use of special tools such as animations, multimedia, dynamic feedback, interactivity and social networking, may enhance adherence and perceived value of the intervention. From a worldwide perspective, about two-third of the population have no access to the internet and many people are deficient in computer skills, hence other delivery modalities of self-help intervention are still needed. We believed it was necessary to conduct another systematic review and meta-analysis which accommodate recent studies and include a whole range of delivery modalities, with a view to generate a more up-to-date evaluation on the efficacy. In addition, we examined the adherence, acceptability and dropout rate of self-help CBT for insomnia as these were not included in previous reviews, and we also explored the possible factors that contribute to the effectiveness of the treatment.

Methods

Selection of studies

We searched the Cochrane central register of controlled trials, PubMed, PsycINFO, Embase and ProQuest dissertations & theses from inception to May 2013. The grouped terms (insomnia OR sleep disorders OR sleep problems OR sleep initiation and maintenance disorder OR dyssomnia) AND (bibliotherapy OR cognitive-behavioral therapy OR internet OR minimal intervention OR self-help OR self-administ* OR self-care OR self-instruct* OR self-manag*) AND (random* OR clinical trial OR randomized controlled trial OR RCT) were searched by title, abstract or keyword. Another search engine, Google Scholar, which covers a wide range of journals, books and even unpublished works, was also searched using the group terms (insomnia OR sleep) AND (self-help OR self-administ* OR self-care OR self-instruct* OR self-manag*) from inception to May 2013. Google Scholar has a limit on the number of search terms being allowed to enter; hence, a different set of search terms was used. After removing duplicates and going through titles and abstracts, relevant papers were retrieved in full-text for detailed assessment. The reference lists of the retrieved papers were also examined for relevant articles. Self-help CBT was defined as any psychological or behavioral approach which can be worked through independently by patients themselves and at least one of the CBT components including stimulus control, sleep restriction, sleep hygiene, relaxation and cognitive therapy must be present. We did not set any specifications for delivery modality, duration of treatment, outcome measure or study quality. All included studies were randomized controlled trials (RCTs) and in English language. Participants with a chief complaint of insomnia or dissatisfaction with sleep who received self-help CBT in comparison with waiting-list control, routine care, no treatment, placebo control, or therapist-administered CBT were included. Self-help CBT given in addition to pharmacotherapy or conventional form of psychological treatment was excluded.

Data extraction

Two authors (YYH and KSK) were responsible for study identification and data extraction. They searched for relevant publications independently and assessed their suitability. Any disagreement was resolved by systematic and thorough discussion with a senior researcher (WFY). One author (YYH) extracted the data and double checked to assure accuracy; the other author (KSK) did a final check on the accuracy of data extraction. The following variables were recorded: participants' characteristics, diagnostic criteria of insomnia, study design, delivery modality of self-help CBT, treatment duration, treatment components, control intervention and outcome measures. The quality of the included studies was evaluated by YYH and KSK using the Cochrane's risks of bias assessment [20]. It evaluates RCTs in six domains, including random-sequence generation; allocation concealment; blinding of participants, personnel, and outcome assessors; incomplete outcome data; selective outcome reporting; and other sources of bias. The ratings of each domain can be 'yes' (low risk of bias), 'no' (high risk of bias) or 'unclear' (uncertain risk). Inter-rater agreement on the Cochrane's risks of bias assessment was substantial (Cohen's kappa = 0.74). Disagreements were resolved by systematic and thorough discussion with WFY.

Statistical analyses

We used the Cochrane Collaboration Review Manager software (RevMan 5.1) for statistical analysis. Continuous outcome data were summarized using effect size, in Hedges's g [21], with 95% confidence interval (CI); for dichotomous outcome, risk ratio with 95% CI was used. Clinical significance of interventions was assessed using the proportion of participants who reached sleep-diary-derived sleep onset latency (SOL) or wake after sleep onset (WASO) < 30 min, sleep efficiency (SE) $\geq 85\%$, or an insomnia