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INPLASY

Effectiveness of Internet-Based Cognitive Behavioral Therapy on Sleep Quality in Adults: A Systematic Review and Meta-Analysis

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ADMINISTRATIVE INFORMATION

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Review Stage at time of this submission - The review has not yet started.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 3 August 2025 and was last updated on 3 August 2025.

INTRODUCTION

Review question / Objective Insomnia and sleep disturbances are prevalent among adults and have wide-ranging health implications. Internet-based Cognitive Behavioral Therapy for Insomnia (iCBT-I) offers a flexible and accessible intervention method that is increasingly used in clinical and community settings. This systematic review and meta-analysis aims to evaluate the effectiveness of iCBT-I compared to usual care or other non-CBT interventions in improving sleep quality among adults.
P(Population):Adults (aged ≥18 years) experiencing sleep disturbances or poor sleep quality
I(Intervention):Internet-based Cognitive Behavioral Therapy (iCBT-I), in any digital format (web, mobile app, video, etc.)
C(Comparison):Sleep quality indicators (e.g., PSQI, ISI, sleep latency, total sleep time)
O(Outcomes):Sleep quality (main outcome measures: PSQI total score; Secondary outcomes included sleep latency, sleep efficiency, total sleep time, ISI score, etc.)
S(Study Design):Randomized Controlled Trials (RCTs).

Condition being studied Poor sleep quality and insomnia symptoms are common in the adult population and may or may not be associated with underlying chronic diseases. While Cognitive Behavioral Therapy is considered the first-line treatment for insomnia, the growing use of digital health technologies calls for a systematic evaluation of internet-based CBT's efficacy. This review will address the effectiveness of iCBT interventions in improving objective and subjective measures of sleep quality in adults.

METHODS

Search strategy We will conduct comprehensive searches in both English and Chinese databases from inception to the date of search execution. English databases include PubMed, EMBASE, Cochrane Library, and Web of Science. Chinese databases include CNKI, Wanfang, and VIP. Search terms will include combinations of: "Internet-Based

Cognitive Behavioral Therapy", "online CBT", "digital CBT", "CBT-I", "insomnia", "sleep quality", "sleep disturbances", "adults", and "randomized controlled trial".
Example PubMed search:
("Internet-Based Cognitive Behavioral Therapy"[Mesh] OR "online CBT" OR "digital CBT" OR "iCBT" OR "Internet-based CBT" OR "Web-based CBT") AND ("Sleep Quality"[Mesh] OR "sleep disturbance" OR "sleep disorders" OR "insomnia" OR "poor sleep") AND ("Adults"[Mesh] OR adult OR middle aged OR aged) AND ("Randomized Controlled Trial"[Publication Type] OR "randomized"[Title/Abstract] OR "RCT"[Title/Abstract]).

Participant or population Adults (≥18 years) experiencing sleep problems or reduced sleep quality, with or without specific disease diagnoses.

Intervention Internet-based Cognitive Behavioral Therapy (iCBT-I), including web-based programs, mobile applications, digital modules, video therapy, or other virtual delivery formats.

Comparator Routine care, waitlist, placebo, health education, or non-CBT psychological interventions.

Study designs to be included Randomized Controlled Trials (RCTs).

Eligibility criteria
Inclusion criteria:
1.Randomized controlled trials
2.Participants aged ≥18 years with reported sleep disturbances or low sleep quality
3.Intervention is internet-based cognitive behavioral therapy (iCBT)
4.Comparison is usual care, waitlist, placebo, or other non-CBT intervention
5.Outcomes include at least one validated sleep quality measure (e.g., PSQI, ISI)
6.Full text available in English or Chinese
Exclusion criteria:
1.Non-RCT designs
2.Interventions not based on CBT or not delivered via internet
3.Studies where sleep is not a primary or secondary outcome
4.Studies combining CBT with other interventions without isolating CBT effects
5.Incomplete sleep outcome data or duplicated publications.

Information sources PubMed, EMBASE, Cochrane Library, Web of Science, CNKI, Wanfang, VIP.

Main outcome(s) Improvement in global sleep quality, as measured by PSQI or equivalent tools.

Additional outcome(s) Sleep latency, sleep efficiency, total sleep time, ISI scores.

Quality assessment / Risk of bias analysis The Cochrane Collaboration's Risk of Bias 2 (RoB2).

Strategy of data synthesis Meta-analysis will be conducted using a random-effects model if statistical heterogeneity is significant (I^2> 50%). A fixed-effec t model will be applied when heterogeneity is low.

Subgroup analysis Subgroup analysis will be performed if necessary:Disease background (e.g., primary insomnia vs disease-related sleep problems);Mode of delivery (web-based vs mobile app vs video);Duration of intervention (<6 weeks vs ≥6 weeks);Age group (young adults vs older adults).

Sensitivity analysis Sensitivity analysis will be performed if necessary:
Excluding studies without clearly defined insomnia diagnosis;Removing high-risk-of-bias studies;Assessing the impact of small sample studies.

Country(ies) involved China.

Keywords Internet-Based Cognitive Behavioral Therapy; iCBT; Sleep Quality; Insomnia; Sleep Disturbances; Adults; Meta-analysis.

Contributions of each author
Author 1 - Kaige Gao - Author 1(First author):Contributed to the study design, literature search and selection, data extraction and quality assessment, statistical analysis, and drafting of the manuscript.
Author 2 - Yuezhen Xu - Author 2 (Corresponding author, supervisor):Supervised the study design and implementation, reviewed and revised the research protocol and manuscript, and approved the final version for submission.