Nonpharmacological interventions for insomnia in older adults: a meta-analysis of treatment efficacy

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Authors' objectives
To examine the effects of non-pharmacological interventions for insomnia in the elderly.

Searching
Computer searches were conducted of PsycLIT and MEDLINE (1966 to 1998). Reference lists of relevant review articles and books were inspected. Requests were sent to prominent researchers in the field to obtain unpublished reports.

Study selection
Study designs of evaluations included in the review
Pre-test, post-test studies and controlled studies of non-pharmacological treatment in the elderly were included. Case reports, studies based on single-subject designs, and studies reporting insufficient statistical information were excluded.

Specific interventions included in the review
The following non-pharmacological interventions were studied: combined behavioural; stimulus control; imagery training; sleep compression; relaxation; sleep restriction; cognitive-behavioural; multicomponent. Control interventions included waiting list, placebo, pre-treatment and unspecified control. Pharmacological treatments were excluded. Therapists included both students and professionals. No details were given of duration of therapy.

Participants included in the review
Participants whose target problem was sleep onset, maintenance or mixed insomnia and who had a minimum age of 50 years with study mean age exceeding 60 years were included.

Outcomes assessed in the review
Outcome measures included at minimum self reports of sleep onset latency (SOL) awakening after sleep onset (WASO), and number of awakenings or total sleep time (TST). Both immediate posttreatment effects and long term effects taken on average 6 months following treatment were evaluated. Self-reports in the included studies were based on daily sleep diaries kept by the patient for 2 weeks before treatment and an equivalent time after treatment and at follow-up.

How were decisions on the relevance of primary studies made?
The authors do not state how the papers were selected for the review, or how many of the reviewers performed the selection.

Assessment of study quality
The authors do not state that they assessed validity.

Data extraction
The following data were extracted: means and standard deviations at baseline, posttreatment and follow-up; type of intervention; patient characteristics; and study characteristics. Effect sizes were calculated by subtracting the mean of the control group from the mean of the treated group at posttreatment and dividing by the pooled standard deviation of the two groups. In studies without a control group the effect size was calculated by dividing the treatment group pre-post change by the pooled standard deviation. Where means and standard deviations were not provided, effect sizes were estimated from appropriate F, t or p values. The authors do not state how data were extracted for the review, or
how many of the reviewers performed the data extraction.

**Methods of synthesis**

How were the studies combined?
Pooled effect sizes (d), weighted by sample size, were calculated for each outcome for immediate effect and follow-up.

How were differences between studies investigated?
Heterogeneity was assessed using the statistic Q. Heterogeneous effect sizes were investigated using planned contrasts and analysing the influence of outliers.

**Results of the review**

Thirteen studies were included (308 patients).

About half of the included studies included a control group.

Posttreatment: significant positive effects for psychological interventions were found for SOL, WASO and number of awakenings. A marginal effect was found for total sleep time.

Sleep onset latency (12 studies, 286 subjects): d = 0.41 (95% CI: 0.24, 0.58; P = 0.000). No heterogeneity was found.

Awakening after sleep onset (10 studies, 235 subjects): d = 0.61 (95% CI: 0.42, 0.80; P = 0.000). Heterogeneity was found (Q = 28.24; P < 0.03). After removal of the largest outlier, the studies were homogeneous (Q = 22.0; P > 0.10). Other planned contrast analyses (no details) failed to explain the heterogeneity. Total sleep time (12 studies, 292 subjects): d = 0.15 (95% CI: -0.02, 0.31; P = 0.083). Heterogeneity was found (Q = 43.21; P < 0.002). An analysis conducted separately between interventions based exclusively on sleep restriction and interventions based on other approaches found studies, thus grouped to be homogeneous. Sleep restriction: reduction in reported sleep time with d = -0.28 (95% CI: -0.55, 0.00; P = 0.045). No sleep restriction: significant increase in sleep time with d = 0.41 (95% CI: 0.19, 0.62; P = 0.001).

Number of awakenings (7 studies, 139 subjects): d = 0.25 (95% CI: 0.01, 0.49; P = 0.043). No heterogeneity was found.

Follow-up: Only one study included a control group. Significant positive effects for psychological interventions were found for all four outcomes.

Sleep onset latency (7 studies, 190 subjects): d = 0.64 (95% CI: 0.44, 0.85; P = 0.000).

Awakening after sleep onset (7 studies, 185 subjects): d = 0.59 (95% CI: 0.38, 0.80; P = 0.000). Total sleep time (7 studies, 183 subjects): d = 0.37 (95% CI: 0.16, 0.58; P = 0.000).

Number of awakenings (3 studies, 68 subjects): d = 0.66 (95% CI: 0.31, 1.01; P = 0.000).

**Authors’ conclusions**

Behavioural treatments produce significant and long-lasting improvements in the sleep pattern of older insomniacs.

**CRD commentary**

The aims and inclusion criteria were stated, though the definition used for insomnia in the included studies was not reported. Attempts were made to locate unpublished material. Some relevant details of the primary studies were clearly presented in tabular format. Statistical heterogeneity was assessed and where heterogeneity was found some investigation was undertaken. The discussion included consideration of the following limitations of the review: the majority of studies excluded patients with psychiatric disease; the majority of studies failed to refer to official diagnostic classifications; interventions overlapped; all the studies were conducted in North America; and the number of
studies in the review was limited.

No details were given of terms used in or language restrictions applied to the literature search. Methods used to select primary studies and extract data were not described. Validity was not assessed. Consideration could have been given to analysing the posttreatment results according to study design.

Given the lack of criteria used to define insomnia, lack of validity assessment and other problems mentions above, the results should be interpreted with caution.

**Implications of the review for practice and research**

Practice: The authors do not report any clinical implications of the review.

Research: The authors state that future research should employ strict adherence to diagnostic systems and develop a non overlapping taxonomy for interventions. They should also address cross-cultural validation of findings, variables that predict patient compliance with psychological interventions, and include patients with co-existing morbidity.

**Bibliographic details**


**Indexing Status**

Subject indexing assigned by CRD

**MeSH**

Cognitive Therapy; Counseling; Psychotherapy /methods; Relaxation Therapy; Sleep Wake Disorders /therapy; Sleep Initiation and Maintenance Disorders /therapy

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**Record Status**

This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.