Cognitive-behavioral treatment with adult alcohol and illicit drug users: a meta-analysis of randomized controlled trials

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CRD summary
This review aimed to evaluate the efficacy of cognitive-behavioural treatment (CBT) in adults diagnosed with alcohol or illicit-drug-use disorders. The authors concluded that CBT offered a small but significant improvement in treatment, and was most effective for marijuana-use disorders and in women. The review had weaknesses in methodology and trial quality, so the reliability of the conclusions is unclear.

Authors' objectives
To examine the efficacy of cognitive-behavioural treatment (CBT) in the treatment of adults diagnosed with alcohol or illicit-drug-use disorders and to identify client or treatment factors to predict CBT outcomes.

Searching
The Campbell Collaboration, the Cochrane Library, PubMed, PsycINFO, Social Services Abstracts and Social Work Abstract databases were all searched. Search terms were reported. Bibliographies of retrieved articles and reviews were examined for further reports. Only papers published in English between 1980 and 2006 were considered for inclusion.

Study selection
Randomised controlled trials (RCTs) that studied the efficacy of CBT, relapse prevention or coping skills training in the treatment of adults (18 years and above) were eligible for inclusion. Eligible trials had to include a primary diagnosis of alcohol or illicit-drug abuse or dependence (as determined by the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition).

Outcomes measured were: days and rates of abstinence, days used or drank or drank heavily, number of symptoms and urine screening. Outcomes were measured post-treatment or after three to 12 months.

Included CBT treatments were either individual or group formats and were delivered alone or in combination with other treatments (including pharmacological). Included outcomes were psychometrically established. The majority of patients were male (70.8%) and 25.9% were ethnic minorities. The majority (80.1%) of trials had a diagnosis of alcohol or drug (cocaine, marijuana, polydrug, opiates) dependence. Treatments and controls were varied. There was a mean number of 18 treatment sessions (range one to 48).

The authors did not state how many reviewers performed the study selection.

Assessment of study quality
Validity was assessed using attrition rates, biologically validated outcomes and manualised treatment delivery.

Data extraction
The standardised mean differences (SMD; Hedges’ g) were calculated for continuous data and odds ratios (ORs) for dichotomous data, with associated 95% confidence intervals (CI). Effect sizes were calculated and averaged to obtain a single effect size in trials that contained more than one control group. Effect sizes were reversed scored if required to ensure consistency in the effect direction. Test statistics were transformed into standardised mean differences when there were no other outcome data; for odds ratios transformations were carried out using the method of Chinn.

The authors did not state how many reviewers performed the extraction.

Methods of synthesis
Primary studies were pooled using fixed-effects meta-analysis, statistical heterogeneity was assessed using the
Cochrane's Q and $I^2$ statistics. Random-effects models were used where statistical heterogeneity was noted. Effect sizes were inverse variance weighted before pooling. Sensitivity analyses were used to assess the impact of random-effects or fixed-effect models and the use of trimmed estimates by moderator. Subgroup analyses of primary drug, type of CBT and type of comparison condition were performed to assess potential study-level moderators. In addition, seven client and treatment variables were examined by meta-regression analysis.

Rank-order correlation and fail-safe N tests were used to assess publication bias.

Results of the review

Fifty-three RCTs (n=9,413 participants, range 20 to 1,656) were included in the analysis. Trials were reported as rigorous with acceptable attrition rates (19.3%), high rates of biologically validated outcomes (75%), and manualised treatment delivery (98%).

Main treatment effect: The pooled effect of cognitive-behavioural treatment (CBT) was found to have a small but significant improvement on the outcome of patients ($g=0.144$, 95% CI 0.094 to 0.194; fixed-effect model; 53 RCTs). Heterogeneity was reported as high ($Q=128.85$, $p<0.005$), so a random-effect model was used ($g=0.154$, 95% CI 0.066 to 0.242). Subgroup analysis indicated that the time of outcome assessment was an important predictor of between-study variance.

Subgroup moderators: Analysis of subgroup moderators across alcohol or primary drugs indicated that CBT treatment had a moderate pooled effect with marijuana use ($g=0.531$, 95% CI 0.375 to 0.651; fixed-effect model; six RCTs), whilst other drugs or alcohol showed only a small effect. RCTs across the type of CBT treatment indicated that the best treatment was CBT combined with psychosocial treatment ($g=0.305$, 95% CI 0.116 to 0.493; random-effects model; 19 RCTs), followed by CBT in combination with pharmacological treatment ($g=0.208$, 95% CI 0.070 to 0.346; fixed-effect model; 13 RCTs) compared to CBT alone ($g=0.172$, 95% CI 0.053 to 0.292; random-effects model; 21 RCTs). RCTs across the type of comparison treatment indicated that it was better to use CBT than no treatment at all ($g=0.796$, 95% CI 0.454 to 1.140; random-effects model; six RCTs). Other comparisons had very small effects and that of using CBT as an adjunct had no effect.

Regression moderators: Meta-regression analyses indicated that outcome assessment type ($p<0.005$) and time of follow-up assessment ($p<0.05$) were negatively related to CBT effect size. Female participants were more likely to respond to treatment ($p<0.05$) and shorter treatment sessions were more likely to produce effective treatments ($p<0.005$).

Publication bias was not found, rank-order correlation was non-significant and fail-safe N was 340.

Authors' conclusions

Cognitive-behavioural treatment (CBT) demonstrated a small but statistically significant efficacy across adult alcohol and other drug-use disorders. CBT effects were strongest with marijuana-use disorders, in women, and when delivered in a brief format.

CRD commentary

The review question was clearly stated and supported by clear inclusion criteria. Relevant sources were searched for published data. Language restrictions may have resulted in the omission of relevant publications, but tests found no publication bias. Presentation of the quality of trials was lacking, limiting the accuracy of further analysis. It was unclear whether independent extraction and analysis of the data was performed by more than one reviewer, this may have also lead to bias.

Standard statistical methods were used to pool the data. There was evidence of statistical and clinical heterogeneity, so the use of random-effects models was appropriate. However, the extent of heterogeneity between trials was not reported for the random-effects model. Subgroup analyses and meta-regression were used to explore the possible reasons for heterogeneity.

Although the authors' conclusions reflected the data presented, the lack of quality assessment and poor reporting of the methodology mean the reliability of their conclusions is unclear.
Implications of the review for practice and research

Practice: The authors stated that CBT maybe particularly effective with marijuana-use disorders and for women when combined with additional psychosocial treatment and delivered in a brief format.

Research: The authors did not state any implications for research.

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