The effect of psychological interventions on anxiety and depression in cancer patients: results of two meta analyses

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Authors' objectives
To conduct 2 meta-analyses of trials of psychological interventions in patients with cancer, the first using anxiety and the second depression as a main outcome measure.

Searching
MEDLINE, PsycLIT and the Social Sciences Citation Index were searched using the keywords: cancer, counselling, psychotherapy, psychological therapy, group support/therapy, relaxation, imagery and visualization. Citations in identified papers and reviews, ASLIB Index to Theses (keywords: cancer, counselling and psychotherapy), and Comprehensive Dissertation Abstracts: Psychology (keyword: cancer) were manually searched. Only trials in the English language available from the British Library service were included.

Study selection
Study designs of evaluations included in the review
Controlled trials published in a journal or indexed as a dissertation before 1993 were included if they evaluated psychosocial or psychiatric interventions aimed specifically at alleviating psychological distress in oncology subjects. Studies were excluded if the main focus was the reduction of physical symptoms, prolongation of survival, impact on immune parameters or reduction of peri-surgical distress. Single group designs were excluded.

Specific interventions included in the review
Psychosocial or psychiatric interventions aimed specifically at alleviating psychological distress in oncology subjects. The authors grouped the interventions into: individual therapy; relaxation; group therapy; group therapy excluding psycho-education; and group psycho-education.

Participants included in the review
Cancer patients; population samples were generally skewed towards whites, the well-educated, women and a diagnosis of breast cancer. Inclusion criteria were largely medical rather than psychological.

Outcomes assessed in the review
Anxiety and/or depression. For anxiety, 9 studies used the Profile of Mood States (POMS) tension subscale as a measure of anxiety, 5 used the Spielberger State Anxiety Inventory, and 5 used other measures. For depression, 12 studies used the POMS depression subscale, 5 used the Beck Depression Inventory and 3 used other measures.

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 authors performed the selection.

Assessment of study quality
The assessment of study methodology was based on Cook and Campbell's (see Other Publications of Related Interest no.1) 4 categories of threats to validity. Studies which used more reliable methods were identified using three factors: use of randomisation, falling into the top 75% on overall quality score, and sample size > 40. The possible influence of different aspects of trial quality were explored in a sensitivity analysis.

Data extraction
Data were entered on a standardised coding form which included criteria for assessing and coding ambiguous
information. Study features were coded under specific domains: independent variable (e.g. type of therapy, 'dose' of therapy), subject (e.g. prognosis) and setting variables, experimental method, dependent variables (i.e. anxiety and depression), and quality of reporting. For those studies comparing 2 different interventions with a common control group the intervention groups' effect sizes are not independent and therefore the data for the less structured intervention arms were eliminated.

No information was given whether data extraction was done by one or more reviewers.

**Methods of synthesis**
How were the studies combined?
Where possible, the effect size 'g' was estimated as a standardised mean difference: this is the mean value for the intervention group minus mean value for control group divided by their pooled standard deviation. For studies not providing this data, 'g' was estimated from precise statistical test values, as described by Hedges and Olkin (see Other Publications of Related Interest no.2). Effect size 'd' was used for small samples. Fixed-effect and random-effects analysis were used in view of the broad entry criteria, the estimates of effect were compared in a sensitivity analysis. Tests for interaction were used to see whether there was evidence of different size of effect in 2 or more groups. Publication bias was estimated using 3 methods: 1) comparing effect sizes for published and unpublished studies, a smaller effect size for unpublished studies would be an indicator of publication bias; 2) funnel plots of sample size against effect size indicate if small sample size trials are inadequately represented; 3) while Rosenthal's (see Other Publications of Related Interest no.3) 'fail safe n' indicates the number of unpublished studies of effect size zero locked away in researchers' filling cabinets which would be required to reduce the mean effect size to a specific level.

How were differences between studies investigated?
A chi-squared analysis was performed to assess heterogeneity.

**Results of the review**
Twenty-five studies were included. Anxiety was used as an outcome measure in 19 studies (1023 patients) and depression in 20 studies (1101 patients). Fourteen studies were common to the 2 meta-analyses.

For anxiety, 19 trials (including 5 unpublished thesis) had a combined effect size of 0.42 standard deviations in favour of treatment against no-treatment controls (95% confidence interval (CI): 0.08,0.74, n=1023), strongly heterogeneous (Q=69.21, P<0.00000). A most robust estimate is 0.36 (95% CI: 0.095,0.63) which is based on a subset of 7 trials which where randomised, scored well on a rating of study quality, had a sample size > 40 and in which the effect of trials with very large effects were cancelled out. For depression, 20 trials (including 6 unpublished theses) had a combined effect size of 0.36 standard deviations in favour of treatment against no-treatment controls (95% CI: 0.08,0.66, n=1101), heterogeneous (Q=40.65, P<0.0027). This estimate was robust for publication bias, but not study quality, and was inflated by 3 trials with very large effects. The removal of these 3 positive outliers with a total sample size of 59 reduces the overall sample size by half to a more robust, but clinically weak to negligible value of 0.19. Group therapy is at least as effective as individual. Only 4 trials targeted interventions at those identified as at risk of, or suffering significant psychological distress, these were associated with clinically powerful effects (trend) relative to unscreened subjects.

**Authors' conclusions**
The findings suggest that preventative psychological interventions in cancer patients may have a moderate clinical effect upon anxiety but not depression. There are indications that interventions targeted at those at risk of, or suffering from, significant psychological distress have strong clinical effects.

**CRD commentary**
The review question was clear and the inclusion criteria seem well chosen. The databases searched and search strategy seem complete and appropriate, although only English language studies were included. Authors did not report the way decisions on in- or exclusion of studies were taken and how data extraction was done. There is no information on how
many reviewers were involved in the quality assessment.

The authors used a summary estimate of effect across studies which was clearly described. Authors expected considerable heterogeneity, therefore a random-effects model was used and several sensitivity analyses were performed. Sensitivity analyses were also used to address publication bias.

It is questionable whether the high degree of heterogeneity justified pooling of effect sizes. The conclusions of the review author seem to follow from the evidence presented. Due to the limitations mentioned above, however, they should be treated with great caution.

Implications of the review for practice and research
Research: future research would be best directed to the effectiveness of interventions targeted at those at risk; the viability and effectiveness of group therapy in European oncology settings; whether the large effects associated with group psycho-educational courses can be replicated; and whether positive effects are maintained at long-term follow-up.

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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.