Randomised controlled trial of non-directive counselling, cognitive-behaviour therapy, and usual general practitioner care for patients with depression. II: Cost effectiveness

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Randomised controlled trial of non-directive counselling, cognitive-behaviour therapy, and usual general practitioner care for patients with depression. II: Cost effectiveness

Peter Bower, Sarah Byford, Bonnie Sibbald, Elaine Ward, Michael King, Margaret Lloyd, Mark Gabbay

Abstract

Objective To compare the cost effectiveness of general practitioner care and two general practice based psychological therapies for depressed patients.

Design Prospective, controlled trial with randomised and patient preference allocation arms.

Setting General practices in London and greater Manchester.

Participants 464 of 627 patients presenting with depression or mixed anxiety and depression were suitable for inclusion.

Interventions Usual general practitioner care or up to 12 sessions of non-directive counselling or cognitive-behaviour therapy provided by therapists.

Main outcome measures Beck depression inventory scores, EuroQol measure of health related quality of life, direct treatment and non-treatment costs, and cost of lost production.

Results 197 patients were randomly assigned to treatment, 137 chose their treatment, and 130 were randomised only between the two psychological therapies. At four months, both non-directive counselling and cognitive-behaviour therapy reduced depressive symptoms to a significantly greater extent than usual general practitioner care. There was no significant difference in outcome between treatments at 12 months. There were no significant differences in direct costs, production losses, or societal costs between the three treatments at either four or 12 months. Sensitivity analyses did not suggest that the results depended on particular assumptions in the statistical analysis.

Conclusions Within the constraints of available power, the data suggest that both brief psychological therapies may be significantly more cost effective than usual care in the short term, as benefit was gained with no significant difference in cost. There are no significant differences between treatments in either outcomes or costs at 12 months.

Introduction

The clinical effectiveness of psychological therapy in primary care has received increasing study in recent years. Although several trials have reported use of health services or included an economic component, full economic analyses of psychological therapies in primary care are relatively rare.

The present study concerns the cost effectiveness of non-directive counselling, cognitive-behaviour therapy, and routine general practitioner care in the management of depression and mixed anxiety and depression. Their comparative cost effectiveness has received attention in one previous trial. Although only counselling produced significantly better clinical outcomes compared with general practitioner care, the patients in that group were less severely ill at baseline, which made interpretation difficult. The limited costing methodology found no difference between therapies in total cost; both were more than twice as expensive as general practitioner care.

Participants and methods

This economic analysis was based on a randomised controlled trial of three treatments for depressed patients in primary care, and methodological details of the trial are reported in full in the accompanying paper. It was designed as a cost effectiveness study, with the Beck depression inventory as the main outcome and the EuroQol as a secondary outcome measure. A societal perspective was taken, which included direct treatment costs, direct non-treatment costs, and costs of lost production.

General practitioners referred 627 depressed patients, of whom 464 were eligible for entry into the study. The main sample consisted of patients randomly allocated to one of the three treatments (n = 197). Patients who were unwilling to accept random allocation were offered the option of choosing their preferred treatment (n = 137) or being randomised between the two psychological therapies only (n = 130). A full comparison of patients allocated by randomisation or preference will be reported elsewhere; the focus of the current analysis is on the main sample of 197 patients. However, in sensitivity analysis, we combined the sample of patients randomised between the two psychological therapies with those randomised to the therapies using conventional randomisation in order to increase the sample size available for analysis of cost differences between the therapies.

Patients allocated to psychological therapy were offered 6-12 sessions with a qualified therapist. Patients in usual care were managed by their general practitioner.

Cost data

Direct treatment costs included contacts with primary and secondary public health services, psychotropic drugs, and private health services. We collected data on use of resources from two sources. We searched general practice medical records for the 12 months before and after referral to our study in order to collect information on general practitioner and practice nurse consultations, hospital referrals, and use of psychotropic drugs. We also gathered details from patients'
self reports at baseline and at four and 12 months fol-
low up; details included visits to health professionals,
hospital referrals, and use of prescribed drugs. Two
psychologists (PB and EW) and a general practitioner
(MG) collected data. No test of the reliability of the data
extraction was undertaken.

Direct non-treatment costs included costs of child
care and travel. Only four patients, however, reported
child care costs, and so these were ignored. Although
we asked about travel costs to secondary care, data
were not reported by a substantial number of patients
who had such visits recorded in their notes. Thus we
also ignored these costs and included only the travel
costs of visits to primary care professionals and to the
psychological therapy sessions.

For indirect costs, we calculated the cost of produc-
tion losses from information gathered by face to face
or postal interviews. Data included employment status,
weeks worked, current wage rate, and an estimate of
time lost from work through illness.

We determined unit costs for the financial year
1997–8 from a variety of sources, including the database
of the Personal Social Services Research Unit and
of the Chartered Institute of Public Finance and
Accountancy and the British National Formulary. We
based travel costs on either self reported fares or
mileage (with a unit cost supplied by the Automobile
Association). The cost of time off work was based
on patient self reports only for 61 patients
(13%). We imputed missing data for general practice
and practice nurse consultations, wages, time off work,
and travel using the mean from the relevant treatment
group and site (London or Manchester). Missing
prescribing and referral data were not imputed and
were assumed to be zero. We completed partial data
(such as missing drug dose) according to various deci-
sion rules (such as clinical judgment regarding
commonly prescribed doses for drugs).

**Statistical methods**
There was no power calculation for costs; we calculated
the sample size on the basis of expected clinical
outcomes. All analyses were carried out on an
intention to treat basis. Although costs were not
normally distributed, we compared mean costs using
standard t tests and analysis of variance methods, and
confirmed the validity of results using bootstrap-
ing. This approach allows inferences to be made
about the arithmetic mean, which is not possible with
logarithmic transformation or conventional non-
parametric tests. The primary analysis was of total
costs, but we also give details of use of individual
resource components (such as primary care, protocol
therapy). The primary analysis was of total costs
incurred in the 12 months after the baseline measure-
ments, but we also adjusted results for the total cost of
care in the 12 months before entry into the study using
multiple regression. We conducted sensitivity analyses
to assess the robustness of results to changes in
assumptions. Discounting was unnecessary as neither
costs nor benefits were recorded beyond 12 months.

**Results**

**Clinical outcome**
Full details on clinical outcomes can be found in the
accompanying paper. Briefly, patients in all three arms
of the trial improved on the primary outcome
measure, but the patients in both psychological
therapy groups made significantly greater clinical gains
in the first four months after allocation. However, all
groups had equivalent outcomes at 12 months. There
were no significant differences in outcome between the
three groups in terms of the EuroQol.

**Costs**
Table 1 gives details of resource use over 12 months.
Patients given usual general practitioner care recorded
more consultations, greater use of antidepressant
drugs, and more psychiatric referrals. Table 2 lists the
total costs in each psychological therapy group as
compared with usual general practitioner care at four
and 12 months.

We found no significant differences between the
three groups at four months in total societal costs
(analysis of variance F = 0.508, df = 196, P = 0.60),
total direct care costs (F = 0.176, df = 196, P = 0.83), or
total production losses (F = 0.384, df = 196, P = 0.68).
Equally, we found no significant difference between the
groups at 12 months in total societal costs (F = 0.449,
df = 196, P = 0.63), total direct care costs (F = 0.111,
df = 196, P = 0.89), or total production losses
(0.374, df = 196, P = 0.68). These results did not dif-
fer when adjusted for costs before entry into the study.
In no case did the bootstrap results suggest that the use
of the t test was invalid.

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**Table 1**: Resources used 12 months after entry to trial by patients given usual general practitioner care or one of two psychological therapies for depression. Values are mean (SD) number of contacts unless stated otherwise.

<table>
<thead>
<tr>
<th>Service</th>
<th>Use of resources (1 year)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Usual GP care (n=67)</td>
<td>Cognitive-behaviour therapy (n=63)</td>
<td>Non-directive counselling (n=67)</td>
</tr>
<tr>
<td>Primary care services*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GP surgery contacts</td>
<td>8.12 (5.1)</td>
<td>6.48 (4.6)</td>
<td>7.71 (6.6)</td>
</tr>
<tr>
<td>Non-attendances</td>
<td>0.29 (0.66)</td>
<td>0.26 (0.55)</td>
<td>0.34 (0.81)</td>
</tr>
<tr>
<td>Out of hours contacts</td>
<td>0.02 (0.12)</td>
<td>0.03 (0.13)</td>
<td>0.02 (0.06)</td>
</tr>
<tr>
<td>GP cooperative</td>
<td>0.16 (1.1)</td>
<td>0.07 (0.25)</td>
<td>0.07 (0.30)</td>
</tr>
<tr>
<td>GP home visits</td>
<td>0.05 (0.27)</td>
<td>0.03 (0.18)</td>
<td>0.04 (0.27)</td>
</tr>
<tr>
<td>Practice nurse contacts</td>
<td>0.53 (1.1)</td>
<td>0.69 (0.95)</td>
<td>0.41 (0.68)</td>
</tr>
<tr>
<td>Non-attendances</td>
<td>0.02 (0.12)</td>
<td>0.03 (0.18)</td>
<td>0.002 (0.01)</td>
</tr>
<tr>
<td>Protocol therapy†</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sessions attended</td>
<td>N/A</td>
<td>4.97 (3.5)</td>
<td>6.44 (4.2)</td>
</tr>
<tr>
<td>Non-attendances</td>
<td>N/A</td>
<td>1.36 (1.5)</td>
<td>0.97 (1.1)</td>
</tr>
<tr>
<td>Medications§</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No (%) of patients taking drug:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Antidepressants</td>
<td>33 (49)</td>
<td>17 (27)</td>
<td>20 (30)</td>
</tr>
<tr>
<td>Minor tranquillisers</td>
<td>12 (18)</td>
<td>4 (6)</td>
<td>10 (15)</td>
</tr>
<tr>
<td>β blockers</td>
<td>3 (4)</td>
<td>5 (8)</td>
<td>2 (3)</td>
</tr>
<tr>
<td>Major tranquillisers</td>
<td>0</td>
<td>0</td>
<td>1 (1)</td>
</tr>
<tr>
<td>Specialist services§</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental health referrals (including therapy based in primary care)</td>
<td>0.52 (0.88)</td>
<td>0.22 (0.52)</td>
<td>0.25 (0.59)</td>
</tr>
<tr>
<td>Non-psychiatric referrals</td>
<td>0.93 (1.28)</td>
<td>0.92 (1.26)</td>
<td>0.93 (1.13)</td>
</tr>
<tr>
<td>GP=general practitioner. NA=not applicable.</td>
<td></td>
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<tr>
<td>*Unit costs from Personal Social Services Research Unit.</td>
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<tr>
<td>†Unit costs from trial service.</td>
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<tr>
<td>‡Unit costs from British National Formulary.</td>
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<tr>
<td>§Unit costs from Chartered Institute of Public Finance and Accountancy for secondary services and from trial service for primary care (in one case a London trial therapist was provided free from a local trust, but a cost equal to the average cost for London was applied).</td>
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</tbody>
</table>
Sensitivity analyses

To evaluate the robustness and generalisability of the results, we performed several univariate sensitivity analyses (table 3). These included using full costs for missed appointments in primary care and specialist facilities (thus assuming that the clinicians were unable to fill the time with alternative activities); use of the most expensive alternative drugs (compared with the generic drug used in the initial calculation); use of the national reported average wage instead of self reported wages; and restricting the analysis to patients with full data (n = 170). The differences in total cost between the three groups remained non-significant.

In a cost comparison of the two psychological therapies only, we also calculated costs on the basis of all randomised patients (those randomised between the three treatments plus those randomised between the two psychological therapies only, n = 265). However, there were still no significant differences in costs.

Discussion

We found no statistically significant differences between the three treatments in total societal costs, direct costs, or the cost of production losses. The overall results are consistent with other recently published studies. However, as with clinical outcomes, our finding of no difference in costs must be interpreted with caution. As is usual, cost data were highly variable, and our study may have been underpowered to detect differences in costs that would be considered important by decision makers. However, in our comparisons of patients allocated to the psychological therapies by either of the randomisation procedures we effectively doubled the sample size available and still found no significant differences. Furthermore, none of the sensitivity analyses significantly influenced the results. The validity of our finding of “no difference” may be strengthened through further original research with larger samples of patients, although recruitment in primary care is often difficult and the costs of such studies may prove problematic. Meta-analysis of cost data from similar studies may be another method of overcoming this problem.

Our three treatment groups showed little variation in the use of specialist services for non-psychiatric problems (table 1). The differences between the groups were in the use of primary care services, psychotropic drugs, and mental health facilities. To assess the impact of the psychological therapies on the use of all other healthcare services, we removed the cost of the two therapies from the analysis. At four months, there was a significant difference in direct treatment costs
of productivity costs from the analysis, friction cost method, which attempts to account for the level of scarcity in the labour market. 

We excluded various cost elements from the analysis—such as the travel costs associated with marked lower rates of time off work or lost production costs. The inclusion of production losses in economic evaluation is still a matter of debate, mainly because of criticisms of the valuation methods used. 

The valuation of production losses on the basis of earnings, as used in this study, ignores the fact that the existence of unemployment allows the replacement of workers who leave the labour force at little cost. Hence, attention has recently turned to the friction cost method of calculation, which attempts to account for the level of scarcity in the labour market. 

The number of patients with missing data was relatively low, and the sensitivity analysis provided no evidence that this was a significant influence on the results. It is unlikely that the inclusion of such costs would significantly change our results.

In conclusion, the use of psychological therapies in general practice was associated with short term benefits in the mental health of depressed patients compared with usual general practitioner care. Since our study failed to find a significant difference in total costs between the three interventions it is possible that the psychological therapies were also more cost effective than usual care in the short term. However, this finding must be considered preliminary, given the low power of the cost calculations. At 12 months, we found no significant differences between the three treatments in outcomes or total costs, and thus there was no evidence that psychological therapies were more cost effective than usual care in the long term. Given such equivalence, commissioners of services are in a position to decide on services based on factors other than outcomes and costs, such as staff and patient preferences or staff availability.

Contributors: MK, BS, and ML conceived the idea for the trial, obtained research funding, and supervised the conduct of the trial and data collection. EW, ML, PB, and MG undertook recruitment of patients and patients and conducted the data management. SB and PR analysed the data. All authors contributed to the writing of the paper. MK is the guarantor for the study.

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