Cost-effectiveness of case management in substance abuse treatment
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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
Several strategies of case management for substance abuse treatment were examined. Specifically, a drug treatment agency, a social service agency and a telecommunications system. All case managers used the Iowa Case Management (ICM) model, a strengths-based problem-solving approach or philosophy of case management. The ICM provided specific techniques for eliciting specific goals and examples of strengths, and provided guidance on appropriate framework for therapeutic work. In general, the ICM was organised round six functions: orientation and contracting; assessment and monitoring; solution planning; referral; orientation to transitional case management; client-directed case management.

The only differences between the three case management strategies analysed were the locations at which the case managers practised and the method of communication between case managers and clients. The drug treatment agency consisted of case management by two social workers who had their offices at the primary drug treatment facility. The social service agency consisted of case management by two social workers who had their offices at a local social service agency. The telecommunication system was based on face-to-face case management in which a social worker had their office in an administrative centre. This case manager met with patients in person at the primary treatment facility to complete some basic tasks and then provided care through the telecommunications system.

Type of intervention
Treatment and rehabilitation.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised clients of a residential facility providing treatment for substance abuse. The inclusion criteria were more than one drug- or alcohol-related offence, a breathalyser test with a blood alcohol content of 0.2 or higher, or involvement in a drug- or alcohol-related accident.

Setting
The setting was a residential facility. The economic study was carried out in the USA.

Dates to which data relate
The effectiveness and resource use data were gathered from October 1995 through October 1998. The price year was 2001.

Source of effectiveness data
The effectiveness evidence was derived from a single study.
Link between effectiveness and cost data
The costing was carried out prospectively on the same sample of patients as that used in the effectiveness analysis.

Study sample
Power calculations, if performed, were not reported. An initial sample of 1,109 eligible patients was identified at the study institution and was invited to participate. However, only 662 (60%) agreed and were included in the study. There were 167 patients in the treatment agency group, 160 patients in the social service agency group, 147 patients in the telecommunications group, and 188 patients in the control group. The mean age of the whole sample was 33.5 (+/- 8.8) years and 59.1% of the patients were men. More than 80% were white and more than 90% were younger than 46 years. The authors noted some differences between those who declined invitation and those who agreed to participate. For example, a greater proportion of participants were female, had recent periods of family conflicts, had recent days of substance abuse, had been arrested and incarcerated, and had more psychiatric symptoms.

Study design
This was a prospective, randomised clinical trial that was carried out at the Mid-Eastern Council on Chemical Abuse, the exact location of which was not reported. The method of randomisation was not described. The length of follow-up was 1 year, but outcomes were also evaluated at 3 and 6 months. The numbers of patients available were 278 (42%) at the 3-month follow-up, 306 (46%) at the 6-month follow-up, and 263 (40%) at the 12-month follow-up. No blinding was performed.

Analysis of effectiveness
The analysis of the clinical study was restricted to treatment completers only. The primary outcome measure was the number of substance abuse-free days. This was obtained from the patients' self-reported days of substance abuse, as derived from the Addition Severity Index (ASI) questionnaire. The ASI assessed, amongst other items, alcohol abuse and drug abuse during the past month. This allowed the researchers to estimate the monthly days of abstinence. The authors did not discuss the baseline comparability of the study groups but, given the design of the study and the randomisation, it is likely that no statistically significant differences were found.

Effectiveness results
No statistically significant differences between groups were observed in terms of substance abuse-free days at any follow-up point.

For example, at 12 months, the mean substance abuse-free days per month were 23.9 (95% confidence interval, CI: 21.8 to 26.1) in the treatment agency group, 25.3 (95% CI: 23.2 to 27.4) in the social service agency group, 21.7 (95% CI: 18.9 to 24.4) in the telecommunications group, and 22.6 (95% CI: 20.0 to 25.1) in the control group.

Similar results were obtained at 3 and 6 months.

Clinical conclusions
The four treatments were equally effective in reducing the number of days of substance abuse.

Measure of benefits used in the economic analysis
The summary benefit measure was the mean number of substance abuse-free days. It was derived directly from the effectiveness analysis.

Direct costs
The analysis of the costs was carried out from the perspective of the facility that delivered the interventions. It included the costs associated with substance abuse treatment, case management staff salaries and benefits, travel expenses and
the telecommunications system. The unit costs were not presented separately from the quantities of resources used. Resource consumption was derived from the sample of patients included in the clinical trial. The costs were obtained from the treatment facility and were described in detail.

Two approaches were used to calculate the costs. In the cumulative method, the costs were calculated from baseline to the respective follow-up periods (3, 6 and 12 months). In the add-on approach, only costs incurred between each of the follow-up assessments (0 to 3 months, 3 to 6 months, and 6 to 12 months) were evaluated. Thus, total costs over 12 months were reported in the cumulative approach, while in the add-on approach initial costs (first 3 months) and costs incurred during the year (3 to 6 months and 6 to 12 months) were reported separately, to assess the impact of the very labour-intensive initial period.

Discounting was not relevant as 1-year costs were considered. The price year was 2001.

**Statistical analysis of costs**
The costs appear to have been treated in deterministically.

**Indirect Costs**
The indirect costs were not considered.

**Currency**
US dollars ($).

**Sensitivity analysis**
A univariate sensitivity analysis was carried out by varying the clinical estimate around the CIs to assess the robustness of the cost-effectiveness ratios (CERs).

**Estimated benefits used in the economic analysis**
See the 'Effectiveness Results' section.

**Cost results**
The average total 12-month costs were $3,124.6 in the treatment agency group, $3,259.3 in the social service agency group, $2,797.6 in the telecommunications group, and $2,739.7 in the control group.

The average 3-month add-on costs (costs up to month 3) were $1,987.3 in the treatment agency group, $2,358.2 in the social service agency group, $2,385.5 in the telecommunications group, and $1,697.6 in the control group.

The average 6-month add-on costs (from month 3 to month 6) were $880.2 in the treatment agency group, $708.0 in the social service agency group, $915.2 in the telecommunications group, and $899.4 in the control group.

The average 12-month add-on costs (from month 6 to month 12) were $257.10 in the treatment agency group, $193.10 in the social service agency group, $351.10 in the telecommunications group, and $142.70 in the control group.

**Synthesis of costs and benefits**
Average CERs (i.e. the average cost per substance abuse-free day per month) were calculated to combine the costs and benefits of the alternative strategies.

At 3 months, the average CER was $78.9 for the treatment agency, $91.4 for the social service agency, $99.4 for the telecommunications system, and $67.6 for the control strategy.
At 6 months, the average CER was $119.50 for the treatment agency, $130.50 for the social service agency, $155.70 for the telecommunications system, and $108.20 for the control strategy.

At 12 months, the average CER was $130.7 for the treatment agency, $128.8 for the social service agency, $179.1 for the telecommunications system, and $121.2 for the control strategy.

When add-on costs were used, the average CERs were:

at 6 months, $36.7 for the treatment agency, $30.10 for the social service agency, $43.20 for the telecommunications system, and $37.50 for the control strategy.

at 12 months, $10.80 for the treatment agency, $7.60 for the social service agency, $16.60 for the telecommunications system, and $6.30 for the control strategy.

Therefore, under base-case conditions, the control strategy was the most cost-effective when cumulative costs were used. However, the add-on cost approach showed that the cost per substance abuse-free day incurred between months 3 and 6 or between months 6 and 12 was relatively similar between strategies. Thus, the higher average CER for the case management strategies compared with the control strategy was produced mainly by the higher initial costs, which could be offset in a longer time horizon. The sensitivity analysis showed that there was some overlap in the average CER, especially for cumulative cost estimations.

Authors' conclusions
Based on the cumulative costs, the case management strategies were not cost-effective in comparison with the control group. However, the add-on costs analysis showed that the vast majority of costs associated with the case management strategies occurred in the first 3 months, while subsequent costs were relatively similar to those of the control group. Thus, a longer follow-up period might have demonstrated the benefits of case management in substance abuse patients, particularly in terms of future savings due to a reduction in treatment costs.

CRD COMMENTARY - Selection of comparators
The authors provided a justification for their choice of the comparators, which were appropriate for the study question. In effect, different delivery modalities of case management were examined. A detailed description of each strategy was given. You should decide whether they are valid comparators in your own setting.

Validity of estimate of measure of effectiveness
The effectiveness evidence came from a clinical trial, the design of which was appropriate given its randomised nature. However, the authors did not provide information on the method of randomisation. The process of sample selection was described in part, but reasons for patient refusal were not reported. Also, the differences between participants and non-participants limit how representative the study sample is. Therefore, caution will be required if extrapolating the results of the analysis to other patient groups. A further issue was the use of a single centre as the setting of the study.

The authors did not discuss the baseline comparability of the study groups, but it is likely that no statistically significant differences were found at baseline. The authors stated that some demographic and clinical baseline factors were included as control variables in the analysis, but the results of this statistical analysis were not reported. Another issue was the fact that the analysis was restricted to treatment completers only. It would have been more appropriate had the authors conducted the analysis on an intention to treat basis, given the substantial loss to follow-up which represents another drawback of the analysis. As the authors acknowledged, this could have introduced some bias into the analysis. Finally, no formal justification for the appropriateness of the sample size was provided. These issues should be considered when assessing the validity of the clinical analysis.

Validity of estimate of measure of benefit
The summary benefit was a disease-specific measure. The authors justified their choice as being an appropriate intermediate measure. However, substance abuse-free days are not comparable with the benefits of other health care
interventions.

**Validity of estimate of costs**
The analysis of the costs was consistent with the stated perspective. A detailed breakdown of the cost items was not provided and the costs were presented as macro-categories. This could limit the possibility of replicating the analysis in other settings. The sources of the costs were reported and were consistent with the viewpoint of the analysis. The costs were treated deterministically and the use of alternative cost estimates was not investigated. The price year was given, which will simplify reflation exercises in other time periods. Owing to the nature of the costs incurred during the study period, two different systems were appropriately used to calculate the costs.

**Other issues**
The authors did not make extensive comparisons of their findings with those from other studies, stating that there was a lack of economic evaluations of case management strategies for substance abuse treatment. The issue of the generalisability of the study results to other settings was not explicitly addressed. A limited sensitivity analysis was carried out, which was restricted to the clinical benefit of the interventions. Therefore, the external validity of the analysis was low and the costs would appear to be relevant only to the specific context of the study. The costs and benefits were combined using average CERs, although the use of an incremental analysis would have been more interesting.

**Implications of the study**
The results of the current analysis did not support the use of substance abuse case management. The authors suggested that further studies with longer follow-up and a focus on programme intensity should be carried out to evaluate the cost-effectiveness of case management in substance abuse.

**Source of funding**
Supported by the National Institute on Drug Abuse.

**Bibliographic details**

**Other publications of related interest**
Because readers are likely to encounter and assess individual publications, NHS EED abstracts reflect the original publication as it is written, as a stand-alone paper. Where NHS EED abstractors are able to identify positively that a publication is significantly linked to or informed by other publications, these will be referenced in the text of the abstract and their bibliographic details recorded here for information


**Indexing Status**
Subject indexing assigned by CRD

**MeSH**
Case Management; Cost-Benefit Analysis; Follow-Up Studies; Substance Abuse Treatment Centers; Substance-Related Disorders /therapy /economics

AccessionNumber
22006005005

Date bibliographic record published
31/03/2007

Date abstract record published
31/03/2007