Cost and outcome analysis of two detoxification services
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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
Two detoxification programmes for people dependent on alcohol were examined.

The first programme was a detoxification service carried out at the Smithfield Centre in Manchester, which was open 24 hours a day, every day of the year. The 10-day detoxification service comprised a 22-bed facility staffed by mental health nurses with 24-hour support from a local general practitioner. The first 3 to 4 days involved managing withdrawal safely. The second part involved social care interventions such as the consideration of housing issues, welfare rights information, relationship issues and criminal justice work.

The second intervention was a partial hospitalisation programme that was performed at Plummer Court, a National Health Service facility. Patients underwent 3-day inpatient detoxification, if required, followed by attendance at a day programme at the Newcastle service. Patients were also given counselling based on cognitive-behavioural principles and including motivation work prior to structured interventions aimed at abstinence or moderate drinking.

Type of intervention
Treatment.

Economic study type
Cost-utility analysis and cost-effectiveness analysis.

Study population
The study population comprised patients requiring alcohol detoxification.

Setting
The setting was both inpatient and outpatient clinics. The economic study was carried out in the UK.

Dates to which data relate
The effectiveness and resource use data were gathered between 1998 and 1999. The costs were expressed using 2003/04 prices.

Source of effectiveness data
The effectiveness evidence was derived from a single study.

Link between effectiveness and cost data
The costing was carried out on a sub-group of patients included in the effectiveness study.
Study sample
Power calculations were not reported. For the Smithfield Centre, all direct-access admissions during an 8-month period from April to November 1998 were included. Of the 283 patients admitted to the centre, 145 (51%) entered the study. For Plummer Court, all admissions during the 8-month period from June 1998 to January 1999 were included. Only patients referred by professional sources or by self-referral were considered; referrals by family or friends were not considered. Of the 113 patients admitted during the enrolment period, 77 (68%) entered the study. The reasons for non-entry were early discharge from the service, severe psychiatric disorders or cognitive impairment, or researcher on leave at the time of admission. Thirteen patients at the Smithfield Centre and 3 at Plummer Court refused to participate.

Study design
This was a within-group comparison study since the outcomes were gathered in a single group of patients for each service. Baseline data were assumed to reflect no intervention, while data gathered at the end of the follow-up period represented the efficacy of the intervention. The study was carried out at two centres. The length of follow-up was 6 months. Of the 222 combined patients included in the final study sample, 2 patients had died during the follow-up, 8 had moved away, and 3 refused follow-up. Therefore, there were 209 potential patients available for follow-up. However, a further 67 were lost to follow-up, thus final data were available for 142 patients (68%). No statistically significant difference in loss to follow-up was found between the two centres.

Analysis of effectiveness
The analysis of the clinical outcomes was restricted to patients with complete follow-up data. The primary outcome measures used were:

- standard ethanol consumption,
- the percentage of days abstinent (PDA),
- the number of drinks per drinking day (DDD),
- the SADQ-C score,
- the physical functioning and mental functioning scores (PFS and MFS, which were the components of the SF-12),
- EQ-5D, and
- GHQ.

Effectiveness results
In the Smithfield Centre group, the following mean changes per patient from baseline to final follow-up were observed:

- $-594.90 (+/- 860.96)$ (95% confidence interval, 95% CI: -790.31 to -399.48; p<0.01) for standard ethanol consumption;
- $34.50 (+/- 39.51)$ (95% CI: 25.64 to 43.34; p<0.001) for PDA;
- $-12.06 (+/- 17.30)$ (95% CI: -15.99 to -8.13; p<0.001) for DDD;
- $-14.54 (+/- 19.04)$ (95% CI: -21.92 to -7.15; p<0.001) for SADQ;
- $-0.16 (+/- 9.11)$ (95% CI: -2.14 to 1.81; p not significant) for PCS;
- $3.72 (+/- 12.65)$ (95% CI: 0.98 to 6.47; p<0.01) for MCS;
- $0.083 (+/- 0.374)$ (95% CI: 0.021 to 0.165; p not significant) for EQ-5D; and
6.21 (+/- 10.75) (95% CI: 3.89 to 8.53; p<0.01) for GHQ.

In the Plummer Court group, the following mean changes per patient from baseline to final follow-up were observed:

-636.1 (+/- 735.11) (95% CI: -838.73 to -433.49; p<0.01) for standard ethanol consumption;

23.70 (+/- 38.34) (95% CI: 13.12 to 34.27; p<0.001) for PDA;

-8.60 (+/- 13.67) (95% CI: -12.41 to -4.80; p<0.001) for DDD;

-11.31 (+/- 13.12) (95% CI: -14.86 to -7.76; p<0.001) for SADQ;

2.63 (+/- 9.92) (95% CI: -0.0001 to 5.26; p not significant) for PCS;

0.98 (+/- 13.63) (95% CI: -2.63 to 4.60; p not significant) for MCS;

0.033 (+/- 0.377) (95% CI: -0.068 to 0.134; p not significant) for EQ-5D; and

4.13 (+/- 9.61) (95% CI: 1.31 to 6.95; p<0.01) for GHQ.

**Clinical conclusions**

The effectiveness analysis showed that the two programmes reduced ethanol consumption and improved several clinical outcomes in comparison with no intervention. However, only marginal improvements in aspects related to quality of life were observed.

**Measure of benefits used in the economic analysis**

The summary benefit measures used were the quality-adjusted life-years (QALYs) in the cost-utility analysis, and unit of drink reduction per day or reduction in percentage of drinking days in the cost-effectiveness analysis. QALYs were calculated using the EQ-5D scores obtained by questionnaires given to the individuals who participated in the study.

**Direct costs**

The analysis of the costs was conducted from a societal perspective. It included the costs incurred by the health care sector, other alcohol treatment services, social services and the criminal justice system. A detailed breakdown of the cost items was provided. The costs and the quantities were presented separately for all health care items. For other items, only unit costs were reported. The resource use data were derived from the same sample of patients as that included in the effectiveness analysis, and were available for 54 Smithfield patients and 49 Plummer Court patients. Details on the cost calculation were reported in an appendix. The costs came from Personal Social Service Research Unit, Home Office, HM Treasury and some published studies. Discounting was not relevant as the costs were incurred during less than two years. The costs were presented in 2003/04 prices.

**Statistical analysis of costs**

Statistical analyses of the costs were performed to test the statistical significance of cost-differences. Non-parametric bootstrapped cost estimates were also calculated to deal with the skewed distribution of the costs. A regression analysis was carried out to assess the impact on the total costs of baseline patient characteristics, clinical outcomes and resources used. Extensive information on the statistical approach used was reported.

**Indirect Costs**

The indirect costs (i.e. productivity losses) do not appear to have been included.

**Currency**
Sensitivity analysis
Sensitivity analyses were not performed.

Estimated benefits used in the economic analysis
The reduction of average drinks per day with respect to baseline was 8.6 in Plummer Court and 12 in the Smithfield Centre. The reduction of alcohol consumption units with respect to baseline was 636 in Plummer Court and 595 in the Smithfield Centre.

Cost results
The total treatment costs were 1,113 (+/- 136) in the Smithfield Centre and 1,054 (+/- 486) in Plummer Court.

In the Smithfield Centre, the total costs per patient were 2,162 (+/-4,306) in the baseline period and 4,321 (+/-7,188) at follow-up. Thus, the cost-difference was 2,160 +/- 8,240 (1,047 +/- 8,208 if treatment costs were excluded).

In Plummer Court, the total costs per patient were 3,264 (+/-4,391) in the baseline period and 3,987 (+/- 3,932) at follow-up. The cost-difference was 723 +/- 3,595 (-331 +/- 3,631 if treatment costs were excluded).

The regression analysis showed that the higher the social costs at baseline, the lower the treatment costs. Also, health status measures were not a predictor of variations in baseline social costs, although there was some relationship with drinking patterns in the baseline period. Finally, both older and female participants had higher baseline social costs.

Synthesis of costs and benefits
Incremental cost-effectiveness ratios and cost-utility ratios were calculated to combine the costs and benefits of each detoxification programme in comparison with no intervention.

In the cost-effectiveness analysis, the cost per unit reduction in alcohol was 1.87 in the Smithfield sample and 1.66 among patients admitted to Plummer Court. The cost for a reduction of one drink per day was 92.75 at the Smithfield Centre and 22.56 at Plummer Court. The cost per percentage point reduction in drinking was 30.71 at the Smithfield Centre and 45.06 at Plummer Court.

The cost per QALY gained was 65,454 (33,727 when considering only treatment costs) at the Smithfield Centre and 131,750 (90,375 when considering only treatment costs) at Plummer Court.

Authors' conclusions
Both detoxification programmes for people dependent on alcohol improved clinical outcomes at a reasonable cost to society. However, patterns of costs through time were quite complex for severely dependent patients and were difficult to predict from drinking patterns or patient characteristics.

CRD COMMENTARY - Selection of comparators
The two programmes under examination were implicitly evaluated in comparison with no intervention, which might represent the standard care approach for people dependent on alcohol in several centres. You should decide whether no intervention is an appropriate comparator in your own setting.

Validity of estimate of measure of effectiveness
The effectiveness evidence came from a within-group comparison study since no external group was used. The authors admitted that the absence of a non-treatment group limits the validity of the study results since the changes in the
outcome measures might have occurred without the intervention. In effect, the baseline values were implicitly assumed to reflect a no-intervention condition. Moreover, time-dependent confounding variables could not be controlled due to the design of the study, and this might represent a limitation of the analysis. Regression models were used to address these issues. The evidence for each programme came from a single centre, which may not be representative of other institutions. Similarly, the small number of patients and the substantial loss to follow-up further limit the robustness of the analysis.

Validity of estimate of measure of benefit
The benefit measures used in the analysis were appropriate. QALYs capture the impact of the interventions on the most relevant dimensions of care (i.e. survival and quality of life) and can be compared with the benefits of other health care interventions. Disease-specific measures were also used in the cost-effectiveness framework. The QALYs were derived from quality of life data, which represents a typical approach.

Validity of estimate of costs
The authors stated that societal costs were included in the analysis. However, only costs related to the public sector appear to have been considered. Indirect costs and other costs borne by the patients were not taken into consideration. The sources used to derive the costs were reported. Information on the unit costs and quantities of resources used was provided for some categories. Statistical analyses of the costs were performed, not only to deal with the skewed distribution of costs but also to assess the possible determinants of total costs. The prices used for the costs were reported, which will enable refiation exercises in other time periods.

Other issues
The authors compared their findings with those from a study that reported lower cost estimates than those observed in the current analysis. The issue of the generalisability of the study results to other settings was not addressed and sensitivity analyses were not performed. This limits the external validity of the study. The analysis referred to people who were dependent on alcohol and this was reflected in the authors’ conclusions.

Implications of the study
The study results would appear to support the implementation of specific detoxification programmes. The authors stated that future studies should validate the use of QALYs as a benefit measure among people with alcohol dependence.

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Other publications of related interest

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