Effectiveness and costs of acute day hospital treatment compared with conventional in-patient care: randomised controlled trial

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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
The study compared acute day hospital treatment versus conventional inpatient care for acute psychiatric patients. Following treatment both groups of patients received community care as usual.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients aged 18 to 65 years old who were voluntarily admitted to the three adult acute psychiatric wards of an inner-city London borough. Criteria for exclusion were homelessness, compulsory admission, organic brain disorder, primary diagnosis of an addictive disorder, and inability to provide informed consent.

Setting
The setting was secondary care (psychiatric hospital wards). The economic study was carried out in the UK.

Dates to which data relate
The effectiveness data were collected during the enrolment period (from May 1999 until May 2002) and for one year after the patients were discharged from the hospital. The cost data were derived from a source published in 2002 or from the authors’ setting. The costs were reported for the price year 2001/02.

Source of effectiveness data
The effectiveness data were derived from a single study.

Link between effectiveness and cost data
The costing has been carried out prospectively on the same sample of patients as that used in the effectiveness study.

Study sample
The sample size was not determined in the planning phase of the study. In addition, power calculations were not conducted retrospectively. All patients who were voluntarily admitted to the selected psychiatric wards and fulfilled the inclusion criteria were selected for the study. Of the 1,395 patients who were admitted to the hospital, only 1,349 were assessed for eligibility. Of the 46 who were not assessed, 14 were excluded because they were admitted to the hospital strictly for diagnostic purposes, 19 because they were already participating in a study, and 13 because they were from
different catchment areas. A further 497 of the 1,349 that remained to be assessed were excluded because they were admitted to the hospital involuntarily, and another 61 could not be assessed for eligibility. Overall, 791 patients were assessed for eligibility. Of these, 445 patients were excluded according to clinical or social exclusion criteria, while 137 refused to participate in the study.

Two hundred and nine patients were initially randomised, 144 to the day hospital treatment group and 65 to the inpatient treatment group. After randomisation, 2 patients from the day hospital treatment group withdrew consent, while a further patient from the same group was also excluded because he had not been discharged by the end of the study period. Overall, 206 patients were included in the study, 141 in the day hospital treatment group and 65 in the inpatient care group.

**Study design**

The analysis was based on a multi-centre (three acute psychiatric wards) randomised controlled trial (RCT). Randomisation to the day hospital or inpatient treatment group was achieved in blocks, using sealed envelopes that were opened by the researchers. The patients were followed-up at discharge and at 3 and 12 months after discharge. At discharge, 95 (46%) patients (63 in the day hospital group and 32 in the inpatient group) were lost to follow-up. This was due to unexpected discharge about which researchers were not informed, self-discharge, patients not returning from leave, and discharge because of non-attendance at the day hospital. The follow-up rate at 3 months after discharge was 71% in the day hospital group and 69% in the inpatient care group. At 12 months, the follow-up rate was 57% in the day hospital group and 55% in the inpatient hospital group. The main reason provided for losses to follow-up was inability to contact patients. Researchers were not blinded to the treatment allocation.

**Analysis of effectiveness**

The analysis was conducted on an intention to treat basis. It was reported that the patient groups were comparable in terms of their baseline characteristics. In addition, it was reported that there were no statistical differences in baseline characteristics, baseline psychopathology and baseline subjective quality of life between patients who completed the study and those who were lost to follow-up.

To reflect the effectiveness of treatment, the authors used psychopathology, subjective quality of life and treatment satisfaction at discharge, 3 and 12 months post discharge, as well as readmission rates, as the primary health outcomes. Psychopathology was evaluated using the 24-item version of the Brief Psychiatric Rating Scale (BPRS) and patients’ satisfaction with treatment was assessed using the Clients’ Assessment of Treatment (CAT) scale. Subjective quality of life was evaluated using the Manchester Short Assessment of Quality of Life (MANSA). Patient values were used and they evaluated their satisfaction with 12 life domains on a Likert-type rating scale.

**Effectiveness results**

In terms of psychopathology at discharge, patients in the day hospital group (n=76) had significantly lower BPRS scores (mean score 1.63, standard error, SE=0.05) than patients in the inpatient group (n=30; mean score 1.87, SE 0.09), demonstrating greater improvement in overall psychopathology, (F=5.18, d.f. = 1, p=0.025, 95% confidence interval, CI: 0.03 to 0.45).

Length of admission did not have an impact on BPRS score at discharge. here were no statistically significant differences in BPRS scores between the two groups at 3 and 12 months after discharge.

In terms of treatment satisfaction, the mean CAT scores at discharge were significantly higher in the day hospital group (n=70; mean score 8.10, standard deviation, SD=1.99) than in the inpatient group (n=34; mean score 6.77, SD=2.26), (p=0.004).

Three months after discharge, the CAT scores remained higher for patients in the day hospital group (n=79; mean CAT score 7.31, SD=1.93) compared with those in the inpatient group (n=41; mean CAT score 6.15, SD=2.48), (p=0.005). Twelve months after discharge, the mean CAT scores between the two groups did not vary significantly.

At discharge, the mean MANSA score was 4.28 (SE=0.11) in the day hospital group and 3.87 (SE=0.18) in the
inpatient group, (F=3.29, d.f. = 1, p=0.073, 95% CI: -0.85 to 0.04). There were no statistically significant differences in mean MANSA scores between the two groups at discharge, and the 3- and 12-month follow-up.

In addition, when length of stay was taken into consideration, it did not have an impact on subjective quality of life at discharge, (p=0.977).

At the 3-month follow-up, the readmission rate reached 12% in the day hospital group and 19% in the inpatient care group. At the 12-month follow-up, it was 26% in the day hospital group and 37% in the inpatient group. These differences were not statistically significant.

**Clinical conclusions**

The authors concluded that the analysis demonstrated that day hospital treatment for voluntary psychiatric patients is more effective in reducing psychopathology in the short run and results in greater patient satisfaction than conventional inpatient care.

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

The authors used the primary clinical measure BPRS as the measure of benefit in the economic analysis.

**Direct costs**

The health service and other support costs used in the analysis were for:

- specialised and domestic accommodation arrangements and living expenses (including staffed accommodation, bed and breakfast accommodation, domestic accommodation),
- inpatient admissions (including general and psychiatric admissions),
- day hospital attendance, and outpatient and emergency room attendance,
- day services (including day services provided by public and independent sector, organisations and education classes),
- community mental health services (including care programme approach key-worker, care manager, community mental health team worker, psychiatrist, psychologist, community psychiatric nurse and individual or group counselling or therapy),
- medication,
- community health services (including nurse, occupational therapist, physiotherapist, general practitioner, practice nurse, dentist and optician),
- other support services (including social worker, home care worker and family support),
- legal services (including police prisons, courts and forensic assessment), and
- complementary therapies (including acupuncture, osteopathy and homeopathy).

All unit costs were derived from an official published source and were adjusted for this project using adequate methodology. It was reported that all unit costs used in the analysis reflect long-run marginal opportunity values and include average revenue costs plus capital and overhead costs. Resource use was based on actual data using an adapted version of the Client Service Receipt Inventory. All costs were reported for the price year 2001 to 2002. Since, the costs were incurred for less than 2 years, discounting was not relevant.

**Statistical analysis of costs**
The unit costs were treated deterministically. The mean treatment costs for the two groups were compared using t-tests, and the results were validated using bootstrapped (1,000 replications) CIs calculated using Stata software (release 8.0 for Windows).

**Indirect Costs**
The indirect costs were not included in the analysis.

**Currency**
UK pounds sterling (\). 

**Sensitivity analysis**
No sensitivity analysis was reported.

**Estimated benefits used in the economic analysis**
For BPRS scores, see the 'Effectiveness Results' section.

**Cost results**
The total intervention costs were estimated for 75 patients in the day hospital group and for 32 patients in the inpatient group.

During the treatment period, the mean total intervention costs were 6,523 in the day hospital group and 3,619 in the inpatient group (bootstrapped 95% CI: 375 to 4,511).

The costs for the day hospital group appear to be higher, partly because half of the patients (n=35) received inpatient care on top of day care.

**Synthesis of costs and benefits**
The analysis demonstrated that day hospital care was more effective but more costly than inpatient care. An incremental cost-effectiveness analysis was conducted, and this demonstrated that day hospital care resulted in a total support cost of 12,267 per additional unit of BPRS score.

**Authors' conclusions**
"Acute psychiatric day hospital treatment may be an effective and desirable, but more costly, alternative to conventional in-patient care."

**CRD COMMENTARY - Selection of comparators**
The study compared day hospital care providing acute treatment only versus inpatient care for psychiatric patients. Inpatient care would seem to represent standard practice in the authors' setting. You should decide if this is a widely used technology in your own setting.

**Validity of estimate of measure of effectiveness**
The analysis was based on a multi-centre RCT, which was appropriate given the study question. The study sample was representative of the study population, and the patient groups were shown to be comparable at analysis. Although the method of randomisation was reported, researchers were not blinded to the intervention. In addition, the procedure was conducted to favour the day hospital group, so that an adequate sample size was achieved, which might have biased the results. The length of the study and loss to follow-up were reported, suggesting that the internal validity of the study is...
likely to be good. The analysis was conducted on an intention to treat basis and an appropriate statistical analysis was undertaken to account for potential biases and confounding factors.

Validity of estimate of measure of benefit
The authors used improvement in psychopathology as the measure of benefit in the economic analysis. This was measured using the 24-item version of the BPRS scale.

Validity of estimate of costs
The perspective adopted in the economic analysis was unclear, but it was not societal since the indirect costs were not included. The costs and the quantities were reported separately, thus enhancing the reproducibility of the results in other settings. Resource use was derived from actual data but no statistical or sensitivity analysis was performed, which may limit the interpretation of the results. The cost estimates were derived from published sources. The unit costs were treated deterministically and no sensitivity analysis was conducted to assess the robustness of the estimates used. However, the price year was reported, which will aid any future reflation exercise. Discounting was appropriately not carried out given the time horizon was less than 2 years.

Other issues
The authors compared their findings with those from other studies, reporting that differences in the results were most probably due to methodological differences in the models used. The authors acknowledged "it remains unclear whether and to what extent their findings can be generalised to day hospitals with different features and care models". The authors do not appear to have presented their results selectively. The study enrolled adult patients who were voluntarily admitted to psychiatric wards and this was reflected in the authors' conclusions. The authors reported two important limitations to their study. First, only 60% of the eligible patients gave consent to participate in the study. The authors expressed their uncertainty on whether this rate of consent would have been higher in a real life context. Second, the losses to follow-up were particularly high, which may have introduced selection bias that could not be accounted for.

Implications of the study
The authors did not make any explicit recommendations for changes in policy or practice. They called for further research on the short- and long-term costs and effectiveness of both health care modules.

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