Quality and costs of community-based residential supports for people with mental retardation and challenging behavior

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 provision of community-based residential support to people with mental retardation and challenging behaviour. Two forms of provision were compared. One was noncongregate settings (policy guidance in the UK), where the minority of residents had challenging behaviour. The other was congregate settings, where the majority of residents had challenging behaviour.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised people with mental retardation and challenging behaviour. Participants were selected if they fulfilled the following criteria:

5 or more items rated as severe problem or a total score of 31 or more on the Aberrant Behaviour Checklist (ABC) Irritability and Hyperactivity sub-scales; and

a score of 20 or less on the Adaptive Behaviour Scale Language sub-scale, plus a score of less than 3 for use of sentences (equivalent to not using complex sentences).

Setting
The setting was community care. The economic study was carried out in England and Wales.

Dates to which data relate
The dates to which the effectiveness data and resource use referred were not reported. The price year was also not reported.

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

Link between effectiveness and cost data
The costing was undertaken prospectively on the same patient sample as that used for the effectiveness study.
Study sample
No power calculations were reported to have been performed in the planning phase of the study. The study sample consisted of 25 adults (aged 16 to 65) with mental retardation and challenging behaviour who were receiving residential care in noncongregate facilities (50% or fewer residents had challenging behaviour) and 25 residents receiving residential care in congregate facilities (over 50% of residents had challenging behaviour).

Study design
This was a prospective longitudinal observational study with controls based on several residential settings. The duration of follow-up was approximately 10 months (mean gap of 9.6 months). Two patients were lost to follow-up. The data, which were collected at the commencement and end of the study period, included characteristics of the participants and co-tenants, structural and procedural characteristics of service provision, and outcomes for participants and co-tenants.

Analysis of effectiveness
Only those participants for whom all data were available were considered in the analysis. The primary outcomes were:

- the risk of accidents, injuries, abuse and exploitation (The Risks Scale-Emerson);
- injuries received;
- the extent of participation in appropriate activities (using non participant direct observation);
- the extent of choice experience (The Choice Scale-Emerson);
- the extent of receipt services from outside of the facilities (Client Service Receipt Interview);
- change over time in psychiatric status, the reported nature and severity and observed nature and duration of challenging behaviour and medication use.

The authors reported that there were no statistically significant differences between the two groups in terms of age, ethnicity, overall ability or challenging behaviour, as measured by the ABC. Those in noncongregate settings had been living in their homes for significantly longer than those in congregate settings, (t (48) = 2.43, p<0.05). There was a trend towards more males in congregate settings. Within-group differences by gender for all outcomes at time 1 were examined. There were no significant differences by gender, except for a greater proportion of males having family in their social network (84% versus 56%), females spending more of observed time engaged in other activity than males (21% versus 7%), and males spending more of observed time engaged in stereotypy than females (33% versus 17%).

Effectiveness results
There was no significant difference in the percentage of participants with a written programme to reduce challenging behaviour at either time.

At time 2, more of those in congregate settings were reported to receive drugs specifically to reduce challenging behaviour, (chi-squared (1, N=48) = 7.15, p<0.05).

Physical intervention was used usually or sometimes at time 1 for significantly more participants in congregate than in noncongregate settings (chi-squared (1, N=50) = 4.4, p<0.05) and at time 2 (chi-squared (1, N=48) = 5.56, p<0.05).

Physical intervention by more than one staff member was used for more patients in congregate settings at time 1 (chi-squared (1, N=50) = 5.33, p<0.05) and at time 2 (chi-squared (1, N=48) = 5.05, p<0.05).

People living in congregate provision were reported to experience greater choice over aspects of their lives at time 1 (t (48) = 2.43 p<0.05), but not at time 2.

Patients in noncongregate settings received significantly more scheduled hours per day of activity at time 1 than those
in congregate settings (t(47) = 3.68, p<0.001) and at time 2 (t(46) = 3.08, p<0.01).

There was no significant difference between the two groups for either observed activity in the home- or community-based activities.

Co-tenants in noncongregate settings took part in more community activities in a 4-week period at time 1 than did those in congregate settings (t (83) = 2.20, p<0.05) and at time 2 (t (86) = 2.34, p<0.05).

There were no statistically significant differences between the two groups at times 1 or 2 for actual accidents, reported risks of accidents, exploitation or abuse (from staff, people in the local community or "others"), and the percentage of residents who had received serious or major injuries from co-tenants.

When combining study participants and co-tenants, 44% of those in congregate settings had received a minor injury at time 2, compared with 15% in noncongregate settings (chi-squared (1, N=138) = 14.12, p<0.0001).

An analysis of variance based on categorical variables, calculated from observed challenging behaviour and ABC scores, showed that more participants in congregate settings showed increased observed challenging behaviour at time 2 than did those in noncongregate settings (chi-squared (1, N=48) = 4.87, p<0.05).

There was also a significant difference in total ABC scores, with more individuals in congregate settings showing an increase of 20 or more than in noncongregate settings (chi-squared (2, N=48) = 6.87, p<0.05).

Clinical conclusions
The study showed that people in congregate settings were more likely to receive psychoactive medication, be subject to physical restraint for challenging behaviour, be injured by co-tenants, show deterioration in mental health and challenging behaviour, and have more restricted access to day activities.

Measure of benefits used in the economic analysis
The authors did not develop a summary measure of benefit for use in the economic analysis. In effect, a cost-consequences analysis was carried out.

Direct costs
The cost/boundary adopted for the costing was that of the facility. Broad expenditure areas included were personnel, accommodation costs and non-accommodation costs (hospital services, non hospital services, day service, aids and adaptations). The resources used came from data recorded using the Client Service Receipt Interview. This information was combined with cost and price information at facility and agency levels. The costing of the capital value of buildings assumed a “next best use” involving long-term investment to generate an annual income at 6% over 60 years. The price year was not stated. Discounting does not appear to have been conducted.

Statistical analysis of costs
The costs were treated stochastically, with t-tests being used to analyse differences between the two groups.

Indirect Costs
No indirect costs were included in the study.

Currency
UK pounds sterling (€). The costs were converted into US dollars ($) at the rate of 1 = $1.65.

Sensitivity analysis
No areas of uncertainty were identified or investigated

**Estimated benefits used in the economic analysis**
A cost-consequences approach was taken. See the 'Effectiveness Results' section.

**Cost results**
Accommodation costs within congregate interventions (range: $49,335 to $175,673) were significantly higher than accommodation costs within noncongregate provision (range: $44,702 to $129,815), (p<0.01).

Non-accommodation costs were significantly higher within noncongregate provision than in congregate provision ($82,265 versus $108,451; p<0.05). There was a higher average cost per annum of day services for noncongregate provision than for congregate provision ($10,296 versus $3,432).

The total costs were significantly higher for congregate provision (mean $115,830 per annum, range: 50,279 to 144,916) than for noncongregate provision (mean $96,010 per annum, range: 55,513 to 144,916), (p<0.018).

When controlling for co-tenant characteristics, the total costs remained higher in congregate settings than in noncongregate settings (adjusted means $121,235 versus $96,268; p<0.01).

**Synthesis of costs and benefits**
The costs and benefits were not combined because of the cost-consequences approach adopted.

**Authors’ conclusions**
Congregate settings have higher staffing ratios. Better quality internal working practices reflected in a 21% increase in costs, although this did not appear to translate into improve outcomes for patients. Therefore, noncongregate settings may be more cost-effective than congregate residential supports.

**CRD COMMENTARY - Selection of comparators**
The rationale for the choice of the comparator was clear in that it represented standard practice in the UK. You should decide whether this represents current practice in your own setting.

**Validity of estimate of measure of effectiveness**
The study design used was a prospective observational study. There was no adjustment for potential biases or confounding factors, although some might have been present. It is unclear from the study whether the effectiveness analysis was handled credibly, and more specifically, whether the sample size was large enough to obtain robust results. The authors adopted the following as measure of effectiveness: risk of accidents, injuries, abuse and exploitation; injuries received; the extent of participation in appropriate activities (using non participant direct observation); the extent of choice experienced; the extent of receipt services from outside of the facilities; change over time in psychiatric status, the reported nature and severity and observed nature and duration of challenging behaviour and medication use. These would appear to be valid measures of effectiveness, although they do not lend themselves easily to comparisons with other interventions. The observational design of the study has inherent problems that limit the internal validity of the results obtained. However, the authors were aware of the limitations and outlined them clearly.

**Validity of estimate of measure of benefit**
Not applicable as a cost-consequences approach was adopted.

**Validity of estimate of costs**
The study perspective, though not stated explicitly, appears to have been that of the facility. Relevant cost categories were included for this perspective, but the fact that they were not described in full makes it difficult to establish whether all the relevant costs were included. The reporting of the cost estimation was rather limited. The statistical analyses performed seem appropriate. A price year was not reported. The costs are likely to be specific for each facility, thus limiting the generalisability of the results.

Other issues
The authors made extensive and detailed comparisons of their findings with those of previous research. They reported that the results of their study were inconsistent with the extensive evidence from both behaviour approach analysis and other approaches to intervention (e.g. psychopharmacology) that suggested that behavioural change can be achieved and maintained over at least the medium term. However, their results were consistent with the epidemiological evidence of the persistence of challenging behaviour, and evidence that in the UK there are very low levels of implementation of behavioural supports in supported accommodation services.

The authors also acknowledged four methodological limitations of the study. First, the provider organisations categorised facilities as congregate or noncongregate. Second, the sample size was relatively small and the risk of type 2 error was considerable. Third, participating organisations were not sampled randomly. Finally, the use of multiple statistical tests on a wide range of measures increased the risk of type 1 error. A more detailed costing exercise would have been more informative to the decision-maker, whilst a detailed resource use description would have helped transferability to other settings. All in all, the results of the study should be considered with some caution.

Implications of the study
As the authors highlighted, in both congregate and noncongregate settings, absolute levels of staff contact and resident activity were low. This indicated that more effective staff management might help ensure that resource inputs have a greater impact on outcomes for residents.

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None stated.

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