Positive behavioural support in schools for children and adolescents with intellectual disabilities whose behaviour challenges: an exploration of the economic case

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Abstract

Decision-makers with limited budgets want to know the economic consequences of their decisions. Is there an economic case for Positive Behavioural Support (PBS)? A small before-after study assessing the impact of PBS on behaviours that challenge and positive social and communication skills in children and adolescents with intellectual disabilities and behaviour that challenges was followed by an evaluation of costs. Results were compared with the costs of alternative packages of care currently available in England obtained from a Delphi exercise conducted alongside the study. Children and adolescents supported with PBS showed improvement in behaviours that challenge and social and communication skills, at a total weekly cost of £1,909 (and £1,951 including carer-related costs). PBS in schools for children and adolescents with intellectual disabilities and behaviour that challenges may help to support them in the community with potential improvements in outcomes and also cost advantages.

Keywords:

Intellectual disabilities, challenging behaviours, positive behavioural support, school, children, economic analysis

Introduction

There are 40,000 children with intellectual disabilities and behaviour that challenges in England (Cooper et al., 2014), many of whom are accommodated in residential care facilities or schools (Gore et al., 2015). Behaviours that challenge and disruptive

behaviours have been reported as the main reason for placement in residential schools (McGill et al., 2006). These placements are associated not only with a reduction in contacts with families and an increased in the already higher vulnerability to abuse and neglect in children with mental or intellectual disabilities (Jones et al., 2012), but also with high costs: £107,987 for a 38-week and £171,176 for a 52-week residential school placement, 2012-13 prices (Clifford and Thobald, 2012).

Consistent with the growing emphasis on provision of care for children with intellectual disabilities and behaviour that challenges outside residential settings and within the community (DH, 2012a; DH, 2012b), Positive Behavioural Support (PBS) has emerged as a promising approach (NICE, 2015; LGA and NHS England, 2014; British Psychological Society, 2004). Advocated since the mid-1980s (Allen et al., 2005), PBS is "a multicomponent framework for (a) developing an understanding of the challenging behaviour displayed by an individual, based on an assessment of the social and physical environment and broader context within which it occurs; (b) with the inclusion of stakeholder perspectives and involvement; (c) using this understanding to develop, implement and evaluate the effectiveness of a personalised and enduring system of support; and (d) that enhances quality of life outcomes for the focal person and other stakeholders" (Gore et al., 2013, p. 15). PBS is characterised by specific values (stakeholder participation, quality of life, inclusion, using a constructional approach to prevent and reduce challenging behaviour), theory and evidence-base (understanding the functions of challenging behaviour, primary use of applied behaviour analysis, secondary use of other evidence-based

approaches), and process (data-driven approach, functional assessment, multicomponent interventions, monitoring and evaluation) (Gore et al., 2013). Built on person-centred planning, applied behavioural analysis (ABA) and inclusion, PBS uses educational and systems change methods to increase the overall quality of life in people with intellectual disabilities and behaviour that challenges living within the community and simultaneously decrease behaviours that challenge (Carr et al., 2002).

PBS interventions in both school and non-school settings have been proven to be effective in decreasing behaviours that challenges and increasing positive skills in children with intellectual disabilities (Carr et al., 1999; Durand et al., 2013; Davis et al., 2012). A recent meta-analysis of PBS in school settings found effectiveness in both reducing behaviours that challenge and increasing appropriate skills, thought with moderate effect sizes (Goh et al. 2010). Notwithstanding the evidence on effectiveness, the economic evidence on PBS in schools is scarce. In the United States, PBS has been implemented in special and mainstream schools in the majority of states (OSEP, 2015) and application of cost analysis and economic analysis to PBS programmes in schools is well described (Blonigen et al., 2008), though economic evaluations are missing. A cost-benefit analysis of a PBS programme in Maryland found saving in staff time, both administrative and instructional (Scott and Barrett, 2004). An unpublished document estimates the costs of implementation of PBS programmes in schools under three different scenarios, where the lack of details on methods hinders the interpretation of the results (Horner et al., 2012). A cost-effectiveness analysis of PBS programmes in eight schools in Philadelphia is currently

ongoing (Eiraldi et al., 2014). In the United Kingdom, use is still confined to a few schools and the evidence is scarce, but is consistent with findings from the United States. In a small study conducted in one English locality, a school-based Positive Behavioural Support Service (PBSS) for children with intellectual disabilities and behaviour that challenges in the community and at risk of school breakdown was found to improve behaviours that challenge and developmental skills in three children for which case studies were described (Jackson Brown et al., 2014).

This study presents an initial exploration of the economic case for the PBSS in schools for children and adolescents with intellectual disabilities and behaviour that challenges in one English local authority.

Methods

A small before-after study assessing the impact of PBSS on outcomes was followed by an examination of costs. We then made comparisons with costs of alternative packages of care for children and adolescents with intellectual disabilities and behaviour that challenges currently available in England obtained from a Delphi exercise that was conducted alongside the evaluation.

Participants

We studied all children and adolescents with intellectual disabilities and behaviour that challenges who were referred and discharged from the PBSS in one English local authority since its inception in 2005 (N=12). The criterion for referral was that their

behaviour placed them at imminent risk of requiring a residential school placement due to school breakdown. A description of the children's developmental profiles has been provided by Jackson Brown et al. (2014).

Intervention

PBSS provides individually tailored intensive interventions built on PBS/ABA principles to support the school placements of children and adolescents with intellectual disabilities and behaviour that challenge in the community and to increase the ability of carers and professionals to cope.

PBSS started in 2005 and is provided by the National Health Service (NHS) in England. It is funded by a joint commissioning group including the local authority social care and special education needs commissioners, and the (NHS) Clinical Commissioning Group. PBSS supports children and adolescents (aged 5-18 years) with moderate/severe intellectual disabilities and severe levels of behaviour that challenges, at imminent risk of requiring a residential school placement due to school breakdown. Children and adolescents are not offered the intervention if it is judged unsafe to work with them. PBSS has three phases (assessment, intensive intervention and support, maintenance/discharge). The assessment phase aims to understand the function of behaviours that challenge in children's life. The intervention and support phase focuses on developing new adaptive skills and behaviours (e.g. emotional literacy, functional communication, continence and self-care) alongside the management of behaviours that challenge. The maintenance/discharge phase seeks to generalise the child's skills across staff and

settings and to embed the intervention programme in the wider school system by joint working with school teachers and staff. Length and content of the interventions varies according to the children's needs and circumstances. PBSS is provided primarily, though not exclusively in schools alongside existing supports, such as short breaks. The service is led by a clinical psychologist with the help of graduate assistant psychologists. Further details have been published elsewhere (NICE, 2015; Jackson Brown et al., 2014)

Measures

Behaviours that challenge. When in contact with PBSS and after the initial assessment, the number of behaviours that challenge was recorded daily for each individual by the clinical psychology team through direct observation as part of the intervention. Because of variability in behaviours that challenge over short periods of time, total incident counts were calculated as weekly averages. For this study, the number of behaviours that challenge was compared before and after PBSS. In order to allow comparison before and after the PBS programme, data were analysed only for children and adolescents that were supported and discharged from the PBSS (N=9).

Verbal Behavior Milestones Assessment and Placement Program. The Verbal Behavior Milestones Assessment and Placement Program (VB-MAPP) (Sundberg, 2008) is a criterion-referenced assessment tool, curriculum guide, and skill-tracking system for children with intellectual disabilities presenting with social

communication delays. It has five core components: milestones assessment and tracking, identifying barriers to learning, transitions assessment, task analysis and skills tracking, curriculum placement and planning (including writing Individualised Education Program goals).

The VB-MAPP Milestones tool is a 170-item assessment framework capturing positive social and communication skills. The tool is organised across three developmental levels (0-18, 18-30, and 30-48 months) and into 16 skills domains (mand, tact, listener, visual perceptual and match-to-sample, independent play, social and social play, motor imitation, echoic, vocal, listener, responding by feature and function and class, intra-verbal, group and classroom skills, linguistic structure, reading, writing, mathematics). Total score ranges between 0-170; higher scores correspond to more advanced developmental skills.

As for the number of behaviours that challenges, the VB-MAPP Milestones was completed by the clinical psychology team every six months after the initial assessment and as part of the intervention since 2009, in order to plan and assess learning targets for individual children. For this study, the total VB-MAPP Milestones scores were compared before and after PBSS, to capture progress in children's positive social and communication skills. In order to allow comparison before and after the PBS programme, data were analysed only for children and adolescents that were supported and discharged from the PBSS and for who total VB-MAPP Milestones data were available (N=5). Data from the remaining four children were

not available as children were discharged from PBSS before the publication and introduction of VB-MAPP within the service in 2009.

Both data on behaviours that challenge and data describing the development of positive social and communication skills were originally collected to support the clinical process and decision-making for the programmes. Therefore inter-rater reliability checks were not undertaken and are not available for the presented data.

Client Service Receipt Inventory. The Client Service Receipt Inventory (CSRI) was used to assess service use (Beecham and Knapp, 2001), after adaptation by the authors (available on request) to collect information on socio-demographic and clinical characteristics, utilisation of services (education, health and social care), and services (health and social care) used by carers due to children's behaviours that challenge. Health and social care services included residential, inpatient, outpatient and community-based care. The CSRI was completed by the PBSS lead clinical psychologist retrospectively over the first six months during the intensive intervention and support phase, using data from clinical files.

Costs

The cost of the PBSS was calculated from data obtained from the joint commissioning group annual review. The review reported annual cost for five children and included the cost of staff (one clinical psychologist and up to five graduate assistant psychologists depending on child needs and circumstances),

clinical supervision costs, administrative and travel costs. Cost averaged £36,405 per child per year (2012-13 prices).

Unit costs for other services were taken from the PSSRU volume (Curtis, 2013), NHS reference costs (DH, 2013), previous studies (Clifford and Thobald, 2012; McGill, 2008), and directly from the CSRI (see *Table 1*). Where needed, costs were inflated using the Hospital and Community Health Services Pay and Prices Index (Curtis, 2013).

<TABLE 1>

Statistical analysis

Socio-demographic and clinical characteristics of the children were described. Total number of behaviours that challenge and VB-MAPP Milestones scores were compared before and after intervention using the paired Wilcoxon signed rank test.

Cost elements

The economic analysis adopted a public services perspective, including education, and social and health care for children and carers. Service costs per week were estimated by combining intensity of use with unit costs. Total costs were estimated by sector (education, health and social care) and service group (residential, inpatient, outpatient, community-based care). Weekly costs were compared with the cost of supporting children and adolescents with intellectual disabilities and behaviours that challenge in the alternative support packages currently available in England

identified by the Delphi process (see below). Analyses were performed in STATA 13 and MS Excel 2010.

Delphi exercise and costs of alternative support

In the absence of a comparison group we used findings from a Delphi exercise that was conducted alongside the evaluation. The Delphi exercise was a consensus exercise that asked a group of experts on intellectual disabilities and challenging behaviours about what support would be likely to be provided in their own localities to four children and adolescents with intellectual disabilities and behaviour that challenges described in four 'case vignettes' that were provided by clinicians from their clinical practice with names and small details changed to preserve anonymity (Iemmi et al., 2015). The Delphi exercise permitted the identification and estimation of the costs of different support packages currently available in England. The Delphi exercise also enabled to estimate the weighted cost of support packages for children with intellectual disabilities and behaviour that challenges, as the cost of the support package multiplied by the proportion of times that each of them was reported by Delphi participants. The four 'case vignettes' provided by one of the authors (FJB) and clinicians from another locality described children and adolescents with intellectual disabilities and behaviour that challenges supported through PBS programs in England. The number of vignettes was hopefully adequate to capture the diversity in needs of children and adolescents with intellectual disabilities and behaviour that challenges and small enough to assure completion in a sensible amount of time.

Ethical approval

Ethical approval was obtained for the overarching study from the Social Care Research Ethics Committee (12/IEC08/0026).

Results

Participants

Table 2 describes the characteristics of the 12 children. Mean age of the sample at start of PBSS was 10 years (SD=11, range 4-13). Ten were boys; eight were white and four from ethnic minorities (Black Caribbean, Black African, Indian, other); seven were living in social housing and five in owner-occupied accommodation. Nine were living with both natural parents and three with the natural mother only. Half the parents were unemployed. Seven children had a diagnosis of an autism spectrum disorder, one of Down syndrome, and one of brain injury and epilepsy; 11 had severe and one moderate intellectual disabilities. All sample members exhibited aggression as the primary behaviour that challenges, with a primary function of escape/avoidance for ten and attention for two of them.

Mean length of PBSS intervention was 22 months (range 7-42).

<TABLE 2>

Outcomes

Table 3 summarises the outcomes before and after PBSS for the 12 children. Among children and adolescents who were supported and discharged from the PBSS (N=9),

mean number of behaviours that challenge per day decreased from 21 (SD=20, range 5-65) before to 4 (SD=5, range 0-14) after PBSS. Among children who were supported and discharged from the PBSS and for whom VB-MAPP Milestones data were available (N=5), total scores increased from 28 (SD=27, range 6-72) before to 53 (SD=48, range=23-136) after PBSS. Differences were statistically significant for both number of behaviours that challenges (z= 2.55, p= 0.01, N=9) and VB-MAPP Milestones total scores (z= -2.02, p=0.04, N=5).

All children and adolescents who continued to receive ongoing support from the PBSS (N=3) were also showing reductions in number of behaviours that challenged and increases in VB-MAPP Milestones scores.

<TABLE 3>

Service use

Table 4 summarises services used by the 12 children and adolescents over six months. Most children in this study were living in the community, except one who was living in a children's home. All attended a public sector day school where they received the daily support of a classroom assistant. Two children saw an educational psychologist once and twice respectively, and one received support from a school family worker. Eleven children experienced respite care (average 29.7 days; SD=8.1). One child lived in a care home for the entire six months. One child used inpatient care, another accident and emergency, and another outpatient services.

Eleven children were supported by the allocated social worker. Three-quarters consulted a psychiatrist at least once. Half the children used community paediatrics at least once. Two children had two consultations with the general practitioner, and another two had regular visits with the community nurse. Two children saw a speech and language therapist. Ten children benefitted from a local travel costs schemes, two used direct payments, and two attended holiday schemes.

Seven carers had regular social worker contacts due to the children's behaviours that challenge. Four carers had contact with the community nurse. One carer used inpatient care twice; another used outpatient services and the general practitioner twice.

<TABLE 4>

Service cost

Table 4 shows the weekly cost of services for the 12 children and adolescents. Total weekly cost of education, health and social care was £1,209, and increased by 2% (£1,251 per week) when health and social care costs incurred by carers due to the children's behaviours that challenge were included. Just under half (42%) of the total was education costs (£526 per week), almost all for day schools, classroom assistance, and school family worker. Educational psychologist costs were small.

Just over half (55%) the costs were for health and social care (£683 per week), two-thirds for residential care respite care for three children; a care home for one child. A

third of health and social care costs were for community-based care: travel costs schemes, social worker, direct payments, psychiatrist, community paediatrics and holiday schemes, and less substantially for community nurse, general practitioner, and speech and language therapist. Inpatient care costs were small.

The costs of health and social care used by carers as a consequence of the behaviours that challenge averaged £42 per week.

When PBSS cost was included, total weekly cost was £1,909 without carer service use, and £1,951 with these included. Under the assumption of an average duration of the PBSS of 22 months and the same use of services over that period, total *annualised* cost was £99,273 without, and £101,462 with carer costs.

Comparison with Delphi results

During the Delphi exercise, the different packages of care likely to be received by the four children with intellectual disabilities and behaviour that challenges described in the four 'case vignettes' were identified and their weekly cost estimated to vary widely from £85 to £151 for packages of care provided within the *community* (without any support, with social care, or with social and mental health care), and from £2,117 to £9,373 for packages of care provided in *residential-based* settings (residential schools, psychiatric hospital, secure unit) (Iemmi et al, 2015). Up to two-fifths of the Delphi participants indicated that the four children would be likely to be supported in residential-based care. After weighting the cost of different support packages by their probabilities (taken from the answers provided by Delphi

participants), the estimated weekly cost for each of the four vignettes was £762, £988, £1,336, and £1,440.

Discussion

PBSS was shown to be effective in decreasing the number of behaviours that challenge and increasing positive social and communication skills in children and adolescents with intellectual disabilities and behaviour that challenges. This improvement was associated with total weekly cost of £1,909 (or £1,951 including costs incurred by carers due to children's behaviours that challenge).

A high proportion of the service costs (42%) were associated with special education, a proportion that is lower than that reported by Snell et al. (2013) from a national epidemiological survey sample of young people with a range of psychiatric disorders. Costs varied considerably between individuals in our sample, linked to heterogeneity of individual needs, characteristics and circumstances. Our sample was too small to examine these variations statistically, but it is interesting that Allen et al. (2007) found that high-cost out-of-area placements were associated with individual characteristics and clinical history, and Knapp et al. (2015) found significant links between individual characteristics, psychiatric needs and costs.

The cost of supporting children and adolescents with PBSS was higher than the likely cost of supporting children and adolescents with intellectual disabilities and behaviours that challenge in England, as estimated through the Delphi exercise. However, out of the 12 children and adolescents initially at risk of residential school

placement, only two were transferred to specialist residential schools, seven remained in the community with less service-intensive support, and three continued to be supported with PBSS (Jackson Brown et al., 2014). While sometimes residential school placements may not be avoided, this suggests that, after an increase in cost during the period of PBSS support – about 22 months – avoiding residential school placements may decrease the long-term cost of care.

The broad diversity in needs of children and adolescents with intellectual disabilities and behaviours that challenge means broad diversity in packages of care and their cost. Thus, the weekly cost of support may vary from £85 for individuals living at home without support (Iemmi et al., 2015), to £3,292 for 52-week residential school placement (Clifford and Thobald, 2012), £4,529 for psychiatric hospital (Curtis, 2013) and £9,373 for a secure unit (Curtis, 2013).

Strengths and limitations

To our knowledge, this is the first study estimating use and cost of services by children and adolescents with intellectual disabilities and behaviours that challenges receiving school-based positive behavioural support in England.

The study has a number of limitations. First, the collection of data at different times did not allow comparison of outcomes at two well-defined points before and after the PBSS. This was because data were originally collected as part of the PBS intervention and only later used for this exploratory evaluation. Second, the absence of inter-rater reliability for data relating to number of behaviours that challenge and

positive social and communication skills, may have led to potential bias. Third, the lack of a control group meant that we cannot attribute the measured improvement in outcomes to PBSS only. Fourth, the absence of data on service use before and after PBSS did not allow us to measure any change in service use and costs over time. Fifth, the high variance in service use for some services may have limited the generalizability of the results. For example, one child was supported in a children's home for the entire six months. Finally, the absence of data on unpaid care and its cost is a limitation; this element has been previously evaluated at 66% of the total societal cost of supporting adolescents with intellectual disabilities and behaviours that challenges (Barron et al., 2013). Moreover, the absence of data on health and social care use by carers before and after PBSS may also have led to underestimation of the potential reduction in public services costs, particularly since behaviours that challenge have been found to be associated with carers' wellbeing (Hastings, 2002).

Searches of comparable datasets in similar localities and the literature were unsuccessful: there is little routinely collected information on behaviours that challenge at local level; the lack of agreement on evaluation tools for behaviours that challenge; and no definition of 'usual care' for children with intellectual disabilities and behaviour that challenges due to the heterogeneity of both service provision across England and children's individual needs and circumstances. We tried to address this limitation by performing a Delphi exercise that generated information on alternative packages of care likely to be received by children and adolescents with learning disabilities and behaviour that challenges in England, and then to estimate their costs (Iemmi et al., 2015).

Implications for practice and for research

Following the Winterbourne View report (DH, 2012a; DH, 2012b) the move from residential-based to community-based care for people with intellectual disabilities has highlighted the challenge of finding suitable support in the community. Care for people with intellectual disabilities and behaviours that challenges is being transformed (NAO, 2015) and effective and cost-effective interventions are recommended (NICE, 2015). PBS and person-centred approaches have emerged as a promising intervention within the community (NICE, 2015; DH, 2014; LGA and NHS England, 2014). In the United States, school-wide PBS has been implemented across the entire education system, and a technical assistance centre established by the Department of Education (OSEP, 2015) to help define, develop, implement and evaluate this model. The United States experience highlighted challenges and positive factors that play a crucial role in the sustainability of the model (Bambara et al., 2012). In particular, the challenges include traditional educational practices and beliefs (e.g. behaviours that challenges should be punished, students with behaviour that challenges are better supported in segregated settings, interventions to manage behaviours that challenge should result in rapid reductions in behaviours that challenge), administrative/organization structure (e.g. lack of leadership and time), and professional development and practice (e.g. lack of training). While the United States have embraced PBS in schools for the management of behaviour that challenges in both special and mainstream settings, providing promising evidence to help its implementation, the use of PBS in schools in the United Kingdom is still confined to few localities.

Our small study suggests that PBS in schools for children and adolescents with intellectual disabilities and behaviours that challenge may be an effective way to support them in their local community and leads to improvements in outcomes and potential cost advantages. A larger study is needed to test these tentative findings robustly.

Authors' Note

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Table 1: Unit costs (£, 2012-13)

	£ (2012-13)	**Source**
Education		
LEA day school	£524 per week	Clifford and Thobald, 2012
Classroom assistant	£0* per week	Clifford and Thobald, 2012
Educational psychologist	£134 per hour	Curtis, 2013
School family worker/ educational support worker	£0* per week	Clifford and Thobald, 2012
Health and Social Care (children)		
Inpatient service (ICU)	£1,373 per day	DH, 2013
Accident and emergency	£115 per contact	DH, 2013
Outpatient service	£172 per contact	Curtis, 2013
General practitioner	£172 per hour	Curtis, 2013
Psychiatrist	£261 per contact	Curtis, 2013
Child development centre/ community paediatrics	£310 per contact	DH, 2013
Community nurse	£50 per hour	Curtis, 2013
Speech and language therapist	£30 per hour	Curtis, 2013
Social worker	£153 per hour	Curtis, 2013
Direct payments	£105-120 per contact	CSRI
Travel costs scheme	£4-100 per contact	CSRI
Holiday schemes	£600-1000 per contact	CSRI
Children's homes	£491 per night	McGill, 2008
Health and Social Care (carers)		
Inpatient service	£598 per day	Curtis, 2013
Outpatient service	£100 per contact	Curtis, 2013
General practitioner	£172 per hour	Curtis, 2013
Community nurse	£50 per hour	Curtis, 2013
Social worker	£159 per hour	Curtis, 2013

LEA: Local Education Authority; ICU: Intensive Care Unit.
Note: *Included in LEA day school cost.

Table 2: Characteristics of the participants (N=12)

	Age (years)	Gender	Ethnicity	Accommodation	Parent(s)'s employment status	Severity of intellectual disability	Comorbidities	Primary behaviour that challenges (function)	Length of PBSS (months)
1	12.7	Male	White	Owner occupier	Employed	Severe	Down Syndrome	Aggression (escape/avoidance)	30
2	13.1	Male	White	Social housing	Unemployed	Severe	None	Aggression (escape/avoidance)	24
3	9.8	Female	White	Social housing	Unemployed	Severe	None	Aggression (escape/avoidance)	36
4	5.6	Male	Black African	Social housing	Unemployed	Severe	ASD	Aggression (escape/avoidance)	42
5	8.8	Male	Black Caribbean	Social housing	Employed	Moderate	ASD	Aggression (escape/avoidance)	16
6	10.2	Male	White	Social housing	Unemployed	Severe	ASD	Aggression (escape/avoidance)	27
7	12.3	Male	Indian	Social housing	Unemployed	Severe	ASD	Aggression (escape/avoidance)	8
8	13.3	Male	White	Social housing	Unemployed	Severe	None	Aggression (escape/avoidance)	9
9	12.5	Female	White	Owner occupier	Employed	Severe	ASD	Aggression (escape/avoidance)	7
10	10.7	Male	White	Owner occupier	Employed	Severe	ASD	Aggression (escape/avoidance)	22
11	3.6	Male	White	Owner occupier	Employed	Severe	Brain injury and epilepsy	Aggression (attention)	24
12	5.2	Male	Other	Owner occupier	Employed	Severe	ASD	Aggression (attention)	18

ASD: Autism Spectrum Disorder.

Table 3: Number of behaviours that challenge and VB-MAPP Milestone of the participants before and after PBSS (N=12)

Sample member	No. behaviours that challenge (per day)		VB-MAPP Milestone (total score)	
	Before PBSS	**After PBSS**	**Before PBSS**	**After PBSS**
1	23.5	5.1	na	na
2	18.2	4.3	na	na
3	6.1	1.0	na	na
4[a]	10.6	8.0	22.0	47.5
5	5.4	0.2	17.5	29.0
6	6.5	8.0	5.5	22.5
7	65.0	1.4	34.0	53.0
8	6.2	0	8.5	24.0
9	41.0	14.0	na	na
10[a]	7.0	6.2	24.5	58.0
11	20.6	1.6	72.0	136.0
12[a]	2.5	1.0	20.5	115.0
Mean	17.7	4.2	25.6	60.6
Mean (discharged children only)	21.4	4.0	27.5	52.9

VB-MAPP: Verbal Behavior Milestones Assessment and Placement Program.
Note: [a] Participants receiving ongoing support. (na) Not applicable.

Table 4: Service use and cost over six months by children and adolescents supported with PBSS (N=12) (£, 2012-13)

	No. using	No. contacts Mean (SD)	Contact: hours Mean (SD)	Weekly cost Mean (SD)
Education				
LEA day school (days)	12	130 (0)	na	524.0 (0)
Classroom assistant	12	97.5 (0)	7 (0)	0.0* (-)
Educational psychologist	2	1.5 (0.7)	1.3 (0.4)	1.7 (4.6)
School family worker/ educational support worker	1	3 (-)	1 (-)	0.0* (-)
TOTAL Education				525.7 (4.6)
Health and Social Care (children)				
Residential care				
Children's home (days)	1	182 (-)	na	286.4 (992.2)
Other than children's home (days)	3	29.7 (8.1)	na	140.1 (261.7)
TOTAL Residential care				426.5 (982.5)
Inpatient care				
Inpatient service (ICU) (days)	1	10 (-)	na	44.0 (152.4)
TOTAL Inpatient care				44.0 (152.4)
Outpatient care				
Accident and emergency	1	1 (-)	na	0.4 (1.3)
Outpatient service	1	1 (-)	na	0.6 (1.9)
TOTAL Outpatient care				0.9 (2.2)
Community-based care				
General practitioner	2	2 (0)	0.5 (0)	1.1 (2.6)
Psychiatrist	9	1.9 (1.7)	1 (0)	11.8 (13.9)
Child development centre/ community paediatrics	6	1.3 (0.5)	0.5 (0)	7.9 (9.3)
Community nurse	2	4.5 (2.1)	1 (0)	1.4 (3.6)
Speech and language therapist	2	1 (0)	1 (0)	0.2 (0.4)
Social worker	11	4.9 (3.1)	1 (0)	26.5 (19.2)
Direct payments	2	26 (0)	na	18.8 (43.9)
Travel costs schemes	10	97.5 (0)	na	139.1 (175.9)
Holiday schemes	2	1 (0)	na	5.1 (12.4)
TOTAL Community-based care				211.9 (221.0)
TOTAL Health and Social Care (children)				683.3 (1078.0)
Health and Social Care (carers)				
Inpatient service	1	2 (-)	6 (-)	23.0 (79.7)
Outpatient service	1	2 (-)	1.5 (-)	0.6 (2.2)
General practitioner	1	2 (-)	0.3 (-)	0.3 (1.0)
Community nurse	4	5.3 (1.5)	1 (0)	3.4 (5.2)

Social worker	7	4.1 (2.4)	1 (0)	14.8 (17)
TOTAL Health and Social Care (carers)				42.1 (81.6)
TOTAL Education and Health and Social Care (children)				1,209.0 (1077.9)
TOTAL Education and Health and Social Care (children and carers)				1,251.1 (1090.6)
PBSS				700.1
TOTAL Education and Health and Social Care with PBSS (children)				1,909.1 (1077.9)
TOTAL Education and Health and Social Care with PBSS (children and carers)				1,951.2 (1090.6)

PBSS: Positive Behavioural Support Service; LEA: Local Education Authority; ICU: Intensive Care Unit.

Note: *Included in LEA day school cost. (na) Not applicable. (-)Not available because based on one case only.