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Article in Journal of Intellectual Disabilities - July 2017
DOI: 10.1177/1744629517716545

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An evaluation of positive behavioural support for children with challenging behaviour in community settings

Ian Grey
Zayed University, United Arab Emirates

Maryann Mesbur
Trinity College, Dublin

Helena Lydon
National University of Ireland, Galway

Olive Healy
Trinity College, Dublin

Justin Thomas
Zayed University, United Arab Emirates

Date accepted: 29 May 2017

Abstract
This study employs a multiple baseline across individual design to describe the implementation of positive behavioural supports for seven children and adolescents in residential community settings over a period of 24 months. These individuals with intellectual disability are residing in one county with long-standing challenging behaviour resulting in home breakdown and serious physical injury. Four types of outcome are presented: rates of behaviour, rates of medication, psychiatric symptomatology and quality of life (QoL). Behaviours reduced to lower levels for the majority of participants following the implementation of positive behavioural supports, and improvements were largely sustained. The use of psychotropic medications reduced or stabilized for the majority of individuals over the same period. QoL Questionnaire scores improved substantially for four participants. The results are discussed in the context of a framework for supporting children with severe challenging behaviours in the community.

Keywords
positive behavioural support, challenging behaviour, children, community settings

Corresponding author:
Ian Grey, Department of Psychology, Zayed University, Abu Dhabi, United Arab Emirates.
Email: ian.grey@zu.ac.ae
Introduction

Positive behavioural support (PBS) has become a primary platform from which service delivery agencies can provide formalized, evidence-based interventions for individuals with intellectual disabilities (IDs) and other developmental disorders who display challenging behaviour. As an approach, PBS has two primary goals: firstly, to reduce the occurrence of challenging behaviour and secondly, to improve the quality of life (QoL) and enhance the skill set and independence of the individual engaging in that behaviour (Grey et al., 2016). A considerable volume of research has accumulated examining the role of PBS as a means to achieve both these goals (Carr et al., 1999; Kincaid et al., 2002; Koegal, Koegal & Dunlap, 1996; LaVigna and Willis, 2005; McClean et al., 2007). For example, Kincaid et al. (2002) reported significant improvements in reductions in challenging behaviour, and improvements in QoL and the successful learning of functionally equivalent and alternative skills (Kincaid et al., 2002). More recently, LaVigna and Willis (2012) conducted a systematic review of multi-element PBS plans, which examined 12 studies comprising of a total of 423 cases and concluded that PBS was successful in reducing challenging behaviour, was cost-effective and easily trainable to front-line staff.

However, to date, only a small number of studies have examined longer term outcomes for individuals with ID who present with challenging behaviour receiving PBS input. The challenge is not only to reduce challenging behaviour and improve QoL for individuals, but it is of equal importance to maintain those gains over time. In the behavioural literature, maintenance effects are defined as steady state responding under treatment conditions meaning low or zero frequency of challenging behaviour over an extended period of time (Stokes and Baer, 1977). In one example evaluating longer term maintenance of behaviour support in community settings, McClean et al. (2007) examined the effectiveness of PBS input for five individuals over a 2-year period, who were identified at the outset as presenting with the most challenging behaviour in a particular geographical region. A functional behaviour assessment was completed for each individual and a behaviour support plan (BSP) was developed upon the results of assessment and subsequently implemented for each individual. Data for frequency of challenging behaviour, mental health symptomology, QoL, psychotropic medication and monthly tracking of implementation rates of BSPs were also tracked over the same period. The authors reported a reduction in the frequency of challenging behaviour to almost zero levels across all participants over 24 months and a reduction in symptoms of psychiatric status using measures of depression, anxiety and hypomania for four out of five participants. Additionally, a substantial increase in QoL (Schalock et al., 1989) scores was reported for three out of five participants and an overall reduction in rates of psychotropic medication by 66% (McClean et al., 2007). These changes were associated with consistent implementation of BSPs of over 80% per month for the duration of the study.

The latter study raises the critical issue of the quality of behaviourally based interventions, which is associated with the effectiveness of PBS. In one early study, Feldman et al. (2004) examined 2506 behavioural interventions and classed them into formal (45%) and informal (55%) behavioural interventions (Feldman et al., 2004). Results indicated that formal interventions yielded a greater reduction in rates of challenging behaviour as well as higher levels of staff training and support (Feldman et al., 2004). To date, research regarding the longitudinal effectiveness of interventions consistent with a PBS framework for children in residential settings remains sparse. This is an important issue to address as existing literature suggests that children and adolescents who are in the care system are at greater risk of manifesting mental health disorders, emotional processing difficulties or behavioural problems in comparison to the general
population (Sainero et al., 2013). However, it appears that children and adolescents with IDs who are in care are at an even greater risk than the typically developing (TD) peers (Sainero et al., 2013). In this study, 45% of the ID group were receiving mental health treatment in comparison to 21% of their TD peers. Of those receiving psychiatric input, 86% of the ID group were prescribed psychotropic medication in comparison to just 50% of the TD group (Sainero et al., 2013). These figures are similar to those reported in other studies conducted with children in residential care (Pecora et al., 2009; Burns et al., 2004). However, research in the area of PBS has illustrated its effectiveness in reducing mental health symptoms using standardized measures such as the PAS-ADD (McClean et al., 2007; Moss et al., 2007).

It is clear that there is a need for further examination of PBS and its outcome effects particularly in respect of children in residential settings including (i) the effectiveness of PBS as means to reduce challenging behaviour, (ii) the maintenance of outcomes, (iii) the effects of PBS on psychiatric symptoms, (iv) the effect of PBS on QoL, (v) the effects of PBS on reducing psychotropic medication and (vi) quality control of BSPs. The current study aims to address these issues. Firstly, it utilizes the BSP quality evaluation ([BSP-QE II]; Wright et al., 2003) to assess intervention quality in addition to the rates of implementation of plans. Secondly, it utilizes the health of the nation outcome scales (HoNOS), Child and adolescent psychiatric assessment scale (ChA-PAS) (Moss et al., 2007) to assess psychiatric symptomatology across time and utilizes previously published methods to determine changes in rates of psychiatric medication over time (McClean et al., 2007). This study examines these issues with a group of seven children aged between 6 and 18 years with ID living in full-time residential care, who displayed substantial challenging behaviour.

**Method**

**Participants**

Seven participants took part in the study. Inclusion criteria for the study were (1) under 18 years of age, (2) a diagnosis of ID, (3) informed consent from parents/guardians, (4) referral to PBS services owing to the presence of substantial levels of challenging behaviour and (5) residing in full-time residential service (defined as spending at least five full days and nights per week). Ethical approval for the study was obtained from researchers affiliate university’s ethics committee. Characteristics of the participants are outlined in Table 1. Each child lived in a house in a normal community setting and six participants shared the home with between two and three other individuals with ID. The remaining individual lived alone owing to the high risk of harm to other individuals.

*Participant 1.* Participant 1 had a diagnosis of moderate ID and a severe speech delay. At the onset of the study, he had no functional speech but had good comprehension and understanding of others speech. He was excluded from his school placement and was unable to access an alternative school placement due to his challenging behaviour.

*Participant 2.* Participant 2 had been diagnosed with a moderate ID and conduct disorder. Prior to engaging with the current service provider, this participant had been placed in foster care. This placement had broken down and she had availed of residential care with another service. However, she was identified as unmanageable within that service due to her challenging behaviour and was referred to the current service. During the baseline
phase, her school placement had broken down as her behaviour became unmanageable within the classroom setting.

**Participant 3.** Participant 3 was diagnosed with autism, ID and multiple mental health difficulties including multiple anxiety disorders, dysthymia and depressive disorder. Prior to engaging in the study, the participant resided in an out-of-county secure mental health facility. However, it was requested that the participant be moved due to unmanageable challenging behaviour.

**Participant 4.** Participant 4 was diagnosed with moderate autism as well as displaying obsessive–compulsive behaviours and high levels of anxiety. She had limited verbal ability and her expressive speech was highly repetitive in nature. At the start of the study, she had been displaying increasing levels of challenging behaviour and heightened levels of anxiety surrounding community access.

**Participant 5.** Participant 5 was diagnosed with moderate to severe ID, autism, both visual and hearing impairments and had no functional method of communication. He lived in full-time residential housing as a result of his challenging behaviour; however, he had parental access once a week.

**Participant 6.** Participant 6 was diagnosed with moderate ID, autism and attention deficit hyperactivity disorder (ADHD). The current service was selected as an appropriate placement owing to his high levels of challenging behaviour.

### Table 1. Characteristics of the participants.

<table>
<thead>
<tr>
<th>Participant</th>
<th>Age at start of intervention (years)</th>
<th>Level of ID</th>
<th>Additional diagnoses</th>
<th>Target behaviour</th>
<th>History of engagement in target behaviour</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8</td>
<td>Moderate</td>
<td>□ Mild ID</td>
<td>Physical aggression</td>
<td>4 years</td>
</tr>
<tr>
<td>2</td>
<td>14</td>
<td>Moderate</td>
<td>□ Conduct disorder</td>
<td>Physical aggression</td>
<td>3 years</td>
</tr>
<tr>
<td>3</td>
<td>15</td>
<td>Mild</td>
<td>□ Autism</td>
<td>Physical aggression</td>
<td>5 years</td>
</tr>
<tr>
<td>4</td>
<td>17</td>
<td>Moderate</td>
<td>□ Autism</td>
<td>Physical aggression</td>
<td>5 years</td>
</tr>
<tr>
<td>5</td>
<td>17</td>
<td>Moderate/Severe</td>
<td>□ Autism</td>
<td>Physical aggression</td>
<td>5 years</td>
</tr>
<tr>
<td>6</td>
<td>14</td>
<td>Moderate</td>
<td>□ Autism</td>
<td>Physical aggression</td>
<td>5 years</td>
</tr>
<tr>
<td>7</td>
<td>13</td>
<td>Moderate</td>
<td>□ Autism, Bowel disorder</td>
<td>Physical aggression</td>
<td>5 years</td>
</tr>
</tbody>
</table>

ID: intellectual disability.
Participant 7. Participant 7 was diagnosed with a moderate ID and autism. This participant had been living in residential services for several years. Prior to this, he had been placed in foster care. However, this placement broke down owing to the participant’s challenging behaviour.

Design
A non-concurrent multiple baseline design across participants was used to monitor the effects of the implementation of BSPs on (1) the frequency of challenging behaviour, (2) psychiatric symptomatology, (3) the rates of psychotropic medication and (4) QoL across all participants.

Measures
Child and adolescent psychiatric assessment scale. ChA-PAS (Moss et al., 2007) is designed to detect mental health problems in children and adolescents with IDs. It is a semi-structured interview and assesses symptoms in the following domains: psychosis, hypomania, depression, anxiety, obsessive–compulsive disorder, conduct disorder and ADHD. The ChA-PAS provides a single score for each diagnostic category and a corresponding threshold. However, expert clinical judgment is emphasized as being a crucial part of diagnosis. The ChA-PAS was administered by a member of the research team who had successfully completed training in administration and correct use of the instrument.

QoL questionnaire. The QoL questionnaire (QoL-Q) is designed to assess QoL for individuals with intellectual and developmental disabilities (Schalock et al., 1989). It is comprised of four sections: satisfaction, competence/productivity, empowerment/independence and community integration. Each category is measured out of nine and higher scores indicate better or improved functioning in the relevant areas.

HoNOS – learning disabilities. The HoNOS–learning disabilities (HoNOS-LD) is the most commonly used clinical instrument to record outcome measures in behaviour, impairment, symptoms and social functioning for individuals with mental health difficulties (Roy et al., 2002). It is an 18-item measure and each item is scored from 0–4, where 0 equals no problem at all, 1 equals minor problem requiring no action, 2 equals mild problem but definitely present, 3 equals moderately severe problem and 4 equals severe to very severe problem. Higher scores represent higher levels of mental health difficulties.

Dependent measures
Frequency of target behaviours. Throughout the study, the daily frequency of behaviours was recorded. A behavioural definition was provided for each behaviour selected and these definitions were finalized with all involved caregivers’ agreement. For the purposes of this study, the most severe topography of challenging behaviour was identified and monthly average instances of this behaviour for each participant was calculated and reported.

Psychotropic medications. All psychotropic medications prescribed to each individual were converted to units of medication according to the drug equivalence information sourced from the
British National Formulary and as reported in McClean et al. (2007). Monthly averages of daily unit of identified medications were calculated.

Periodic service review. The periodic service review (PSR) is a system of quality assurance that provides a percentage for the daily implementation of a BSP (LaVigna et al., 1994). These daily figures were subsequently converted into monthly averages. It is a self-report measure and staff were provided with an operational definition of each intervention and required to record whether each intervention was implemented according to specified criterion. Depending on the particular intervention in question, this may stipulate daily, weekly or fortnightly implementation.

BSP quality evaluation. The BSP-QE II is an assessment that facilitates rating of the quality of a BSP in place (Browning-Wright et al., 2003). A number of categories are scored: definition of problem behaviour, predictors of behaviour, analysing what is maintaining the problem behaviour, environmental changes, predictors related to function, function related to replacement behaviours, teaching strategies, reinforcement scheduling, reactive strategies, goals and objectives, team coordination and communication. A total score of 0–12 points equals a weak plan, 13–16 points equals an underdeveloped plan, 17–21 points equals a good plan and 22–24 points equals a superior plan.

Procedure

Baseline

The study was conducted over 24 months for each participant. Dependent measures collated during baseline and throughout intervention stages included average daily frequency of challenging behaviour per month and average daily unit consumption per month of psychotropic medication. The frequency of these baseline measures was recorded daily across the 24-month duration and monthly averages as described above were computed. The ChA-PAS, the HoNOS-LD and QoL-Q were completed at three time points: during baseline (T1), after 12 months (T2) and after 24 months (T3).

Intervention

Following baseline, interim behavioural recommendations (BRs) were put in place for participants while they awaited a formal BSP. These recommendations developed by a board-certified behaviour analyst after examination of baseline data, direct observation and indirect interview with family and support staff. A formal functional assessment was then conducted and hypotheses were developed regarding the function of the challenging behaviour for the individual. A BSP was then implemented.

Each BSP identified interventions in four domains: (1) environmental accommodations – client-specific adaptions to their environment in order to decrease the likelihood of an occurrence of challenging behaviour, (2) direct interventions – systems of reinforcer delivery, (3) functional skills teaching – programs designed to provide each client with appropriate functionally related skills and (4) reactive strategies – responses to instances of challenging behaviours designed to keep the client and others safe (McClean and Grey, 2016; see Table 2).
Table 2. Details of BSPs for all participants.

<table>
<thead>
<tr>
<th>Participant number</th>
<th>Function of target behaviour</th>
<th>Environmental accommodations</th>
<th>Skills teaching</th>
<th>Direct interventions</th>
<th>Reactive strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>□ Escape from demands □ Access to tangibles □ Attention</td>
<td>□ Individualized environment</td>
<td>□ Facilitated relaxation program</td>
<td>□ DRO</td>
<td>□ Planned ignoring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>□ Activity change preparation</td>
<td>□ Functional communication skills – PECS</td>
<td>□ Token economy</td>
<td>□ Redirection followed by relaxation program</td>
</tr>
<tr>
<td></td>
<td></td>
<td>□ Community access</td>
<td>□ Self-management: Waiting, time alone, self-care</td>
<td>□ Redirection from precursor behaviours</td>
<td>□ Access to calm room</td>
</tr>
<tr>
<td></td>
<td></td>
<td>□ Daily visual schedule</td>
<td></td>
<td></td>
<td>□ NCI transport hold</td>
</tr>
<tr>
<td>2</td>
<td>□ Attention</td>
<td>□ Individualized environment</td>
<td>□ Healthy eating</td>
<td>□ DRO</td>
<td>□ Traffic light system for precursor behaviour</td>
</tr>
<tr>
<td></td>
<td>□ Emotional issues/confusion over separation from family</td>
<td>□ Self-contained apartment</td>
<td>□ Time alone sessions</td>
<td>□ Token economy</td>
<td>□ Planned ignoring of challenging behaviour</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□ Night-time routine behavioural contract</td>
<td>□ Personal space following precursor behaviour</td>
</tr>
<tr>
<td>3</td>
<td>□ Attention</td>
<td>□ Individualized environment</td>
<td>□ Education of consequences of physical aggression</td>
<td>□ Daily visual rules</td>
<td>□ Personal safety techniques</td>
</tr>
<tr>
<td></td>
<td>□ Escape from demands □ Loss of activity □ Mental health problems</td>
<td>□ No TV/media access</td>
<td>□ Independent day planning</td>
<td>□ Behavioural contract</td>
<td>□ Redirection following de-escalation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>□ Community access</td>
<td>□ Relaxation program</td>
<td>□ Choice of rewards</td>
<td>□ Planned ignoring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>□ Daily visual schedule</td>
<td></td>
<td></td>
<td>□ Redirection followed by relaxation program</td>
</tr>
<tr>
<td>4</td>
<td>□ Obsessive behaviour around washing machine</td>
<td>□ Structured timetable around washing machine use</td>
<td>□ Facilitated relaxation program</td>
<td>□ Antecedent control</td>
<td>□ Planned ignoring</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>□ Functional laundry skills</td>
<td>(washing machine voucher, rules for the day</td>
<td>□ Redirection followed by relaxation program</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>□ Self-care hygiene skills</td>
<td>□ Interval DRO</td>
<td></td>
</tr>
</tbody>
</table>
|                    |                                                                  |                                                   |                                                   | □ Token economy                         |                                        | (continued)
<table>
<thead>
<tr>
<th>Participant number</th>
<th>Function of target behaviour</th>
<th>Environmental accommodations</th>
<th>Skills teaching</th>
<th>Direct interventions</th>
<th>Reactive strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Escape from demands</td>
<td>Individualized environment</td>
<td>Toilet training</td>
<td>Antecedent control</td>
<td>Access to calm room</td>
</tr>
<tr>
<td></td>
<td>Access to tangibles</td>
<td>Daily community access</td>
<td>FCT – Objects of reference</td>
<td>Redirection from precursor behaviours</td>
<td>NCI transport hold</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Daily activity schedule</td>
<td>Waiting program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Escape from demands</td>
<td>Individualized environment</td>
<td>Facilitated Relaxation Program</td>
<td>Daily visual rule chart</td>
<td>Redirection followed by relaxation program</td>
</tr>
<tr>
<td></td>
<td>Access to tangibles</td>
<td>Activity change preparation</td>
<td>Functional communication skills – negotiation, expression of emotions</td>
<td>Token economy/DRO</td>
<td>Access to calm room</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Community access</td>
<td>Self-management: Waiting, time alone, self-care</td>
<td>Behavioural contract</td>
<td>NCI transport</td>
</tr>
<tr>
<td>7</td>
<td>Escape from demands</td>
<td>Individualized environment</td>
<td>Food utensils de-sensitization program</td>
<td>Daily visual rule chart</td>
<td>Redirection to time alone in living room</td>
</tr>
<tr>
<td></td>
<td>Obsessive behaviour around eating utensils</td>
<td>Community access</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Daily visual schedule</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

BSP: behaviour support plan; DRO: Differential Reinforcement of Other behaviour; FCT: Functional Communication Training; NCI: Non-violent Crisis Intervention; PECS: Picture Exchange Communication System
Results

Quality of BSPs

The BSP-QE II scored the quality of plans according to four categories – weak, underdeveloped, good and superior. All BSPs implemented were rated as superior plans.

Frequency of target behaviour (physical aggression) and PSR

Figure 1 illustrates the monthly average frequency of target challenging behaviour and the monthly average PSR percentage, which provides a measure of BSP implementation for all seven participants. It also presents onset of BRs/BSPs. All participants displayed reductions in challenging behaviour to lower levels following the intervention phase.

For four of the seven participants, some fluctuation in levels of challenging behaviour can be seen following intervention phase. However, all four had returned to almost zero levels by the end of the study as a result of BSP reviews and adjustments. A summary of events associated with increases in challenging behaviour is presented in Table 3.

Psychotropic medication

Figure 2 presents the monthly average daily units of medication for the seven participants who were prescribed with psychotropic medication at any time during the study. Five participants were in receipt of psychotropic medication at the onset of the study. There were five different forms of psychotropic medication across the participants: anti-depressants, anxiolytics, ADHD medication, anti-psychotics, and mood stabilizers. For two out of the five participants in receipt of psychotropic medication, a substantial reduction in medication was observed and was eliminated completely for one individual. For the remaining two participants prescribed with psychotropic medication, a reduction was not evident. However, medication usage stabilized within 2 to 4 months following intervention for these participants.

The ChA-PAS

Participant 1 displayed a reduction in scores of anxiety, depression, mania and ADHD from T1 to T3 (see Figure 3).

Participant 2 showed a reduction in anxiety and a reduction to zero levels for mania and conduct disorder. However, her depression score increased. Participant 3’s ChaPAS scores indicated an overall reduction in depression and mania. His psychosis score remained stable. However, his anxiety score increased. Participant 4 displayed a decrease in scores for anxiety, depression and mania and an increase in OCD scores between T1 and T2. However, there was an increase in all scores at T3. However, these elevations can be accounted for by her awareness of an impending change in her residential location, which was a source of considerable anxiety for her. For participant 5, scores on anxiety and depression increased at T2 but scores returned to low levels at T3. Scores for mania decreased to zero levels at T3.

For participant 6, there was an elevation of scores for anxiety, depression and mania between T1 and T3. For participant 7 scores for depression and anxiety dropped to zero by T3. There was a slight increase in his mania score and an increase in OCD scores.
Figure 1. Frequency of target behaviour and periodic service review implementation for all participants.
The HoNOS for people with learning disabilities

The HoNOS results showed overall reduction in total scores from T1 to T3 for six of the seven participants, which indicates a reduction in mental health difficulties as well as improvements in behaviour, impairment, symptoms and social functioning. For two of these participants, there was an initial increase in T2 scores but subsequent scores at T3 dropped to below those at T1 (see Figure 4).

Quality of life

The QoL-Q’s cumulative overall score suggests interesting results over the 2-year period (see Figure 5). The total QoL score is out of nine, and higher cumulative scores show improvement in independence, socially functioning and adaptive behaviour. Three participants, participants 2, 5 and 1 made progressive gradual gains in their QoL score from T1 to T3, with scores improving each year. Participants 4 and 3 both showed an improvement in T2 but scores dropped in T3. At T3, participant 4 had moved into a new apartment and part of her reduced score was due to a smaller living space and transitioning difficulties relating to her new environment. Participant 6’s scores remained the same in T1 and T2 and reduced slightly in T3. Finally, participant 7 showed a substantial reduction at T2. Their health declined further at T3 owing to a bowel disorder, which despite substantial medical attention had not been resolved.

Discussion

Few studies to date have examined the implementation of PBS for children in residential community settings over an extended period of time. The current study aimed to add to existing research regarding the long-term outcomes of PBS for children with a diagnosis of ID who display challenging behaviours in such settings. All children in the current study were placed in residential care owing to the breakdown of home placement caused by the severity of challenging behaviours. A substantial body of research speaks to the emotional consequences experienced by parents as a result of their children being placed in residential care and that such placement typically is preceded by several years of exposure to challenging behaviours in the home setting. However, consequences also affect the children themselves, and those children and adolescents who live in

<table>
<thead>
<tr>
<th>Participant: Month number</th>
<th>Setting event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participant 1: 6–9</td>
<td>Return to school following Christmas holidays</td>
</tr>
<tr>
<td></td>
<td>Steady reduction in Abilify</td>
</tr>
<tr>
<td>Participant 2: 4</td>
<td>Moved to new school</td>
</tr>
<tr>
<td>Participant 6: 10–11</td>
<td>Change to family access routine</td>
</tr>
<tr>
<td></td>
<td>Increases in challenging behaviour were recorded on transition to residential home after access</td>
</tr>
<tr>
<td>Participant 7: 15–16</td>
<td>School summer holidays</td>
</tr>
<tr>
<td></td>
<td>Changes to BSP protocol (extinction burst)</td>
</tr>
<tr>
<td></td>
<td>Ongoing bowel disorder</td>
</tr>
</tbody>
</table>

BSP: behaviour support plan.

Grey et al. 11
Figure 2. Average daily unit consumption of psychotropic medication for relevant participants.
Figure 3. ChA-PAS scores across time period for each participant. ChA-PAS: child and adolescent psychiatric assessment scale.
out-of-home care are considered to be particularly vulnerable to manifesting mental health difficulties and those children with accompanying IDs are considered to be at increased risk (Sainero et al., 2013). Despite estimates that up to 30% of children in residential care have disabilities, a recurring theme in the literature is that children with disabilities constitute an overlooked group (Trout et al., 2009). These children, in comparison to non-abled peers, have greater levels of need and show greater risks for mental health difficulties such as anxiety. There have been some attempts at determining the outcomes for children with disabilities as a consequence of residential placement. For instance, using a qualitative methodology, Crettenden et al. (2014) state that parents reported that the frequency of challenging behaviours had reduced following residential placement. However, no quantitative data in relation to frequency of challenging behaviour, mental health symptomatology or QoL changes rendering firmer conclusions difficult to make.

Figure 3. (continued).
As mentioned in the introduction, PBS has a number of core defining features. Appropriate environmental alterations, skills teaching, community access and promotion of self-sufficiency are essential features of a PBS approach and appear to have resulted in positive change for the participants.

![Graph](attachment:image.png)

**Figure 4.** Total HoNOS-LD scores for all participants. HoNOS-LD: health of the nation outcome scales–learning disability.

![Graph](attachment:image.png)

**Figure 5.** QoL scores for all participants. QoL: quality of life.

As mentioned in the introduction, PBS has a number of core defining features. Appropriate environmental alterations, skills teaching, community access and promotion of self-sufficiency are essential features of a PBS approach and appear to have resulted in positive change for the participants.
majority of the participants. Six of the seven participants showed a reduction in the frequency of challenging behaviour from baseline and these reductions were largely maintained in the months following implementation.

At the outset of the study, five participants were in receipt of psychotropic medication and changes in rates were observed over the study. One participant discontinued psychotropic medication completely, another reduced their levels of intake substantially and the remaining three participants stabilized their medication dosage following PBS input. Medication rates increased for the remaining two participants, though remained stable following changes. These findings support previous research in an adult population (McClean et al., 2007) and illustrate that behavioural interventions can be an effective tool in managing psychiatric symptomatology and achieving stabilization of, or reduction in, levels of psychotropic medication. This serves to validate the premise of involving behavioural practitioners in the psychiatric assessment and treatment process for individuals with IDs (McClean and Grey, 2007). These reductions are mirrored in observed reductions in HoNOS scores over the 2-year period for six of the seven participants.

Perhaps the most interesting finding was the substantial improvement in four participants’ QoL scores following PBS input. The reductions in QoL for the remaining three participants were largely attributable to specific setting effects such as illness and transitions to alternative accommodation. Appropriate environmental alterations, skills teaching, community access and promotion of self-sufficiency are core features of a PBS approach, which appeared to have resulted in positive change for four participants.

The quality of BSPs and their consistent implementation as measured by the PSR appears to be the primary variable accounting for the predominantly positive changes observed in the domains outlined above. All seven plans were rated as superior when assessed by the BSP-QE II, which provides a measure of confidence in their clinical utility. All BSPs implemented (with functional behaviour assessment conducted prior to formulation) were deemed to be of a superior standard. However, it must be acknowledged that although the BSP-QE II provided an indication on the quality of BSPs, it does not provide information regarding the relative importance of different components of a BSP. Previous research has focused on this subject (McClean and Grey, 2012; McVilly et al., 2012), and there is a need for future research regarding the sequencing of interventions and their relationship with maintenance. For example, the full implementation of a BSP immediately for an individual may place initial stress on a care team, whereas a sequenced approach of implementation may have a range of benefits such as reduced stress.

Though periodic episodes of challenging behaviour remained evident in the participants, these were relatively brief, and in almost all cases frequency did not return to baseline levels. More importantly, setting events for increases in challenging behaviour when it did occur were related to specific identifiable setting events. It is important to be aware that children in many residential settings face different barriers than their adult counterparts. Firstly, their time is punctuated by episodic and sometimes lengthy breaks from the school setting, which can make transitions difficult. Secondly, they are faced with mandatory transitions at age 18 in Ireland, which can produce considerable anxiety as was evident in the case of one individual in this study. This individual was content in her placement but legislation required that she move to an adult service. Thirdly, and perhaps more importantly, there is the difficulty of ensuring with different policies and practices in different settings. The effective translation of behaviour support into school settings is at the best of times a significant challenge in itself. An implication of these realities for children in residential settings is that PBS is not a panacea to structural/policy barriers than children encounter and can
only be effective when policy accurately reflects the unique needs of children who display challenging behaviour in residential settings.

**Declaration of Conflicting Interests**

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

**Funding**

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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