

Outcome Evaluation of a Specialized Treatment Home for Adults with Dual Diagnosis and Challenging Behaviour

Abstract

There is increasing recognition of the need for specialized services for persons with intellectual disabilities who have mental health and behavioural challenges (dual diagnosis). Using pre-post and multiple baseline (across participants) designs, we evaluated a publicly-funded specialized community treatment home program for individuals with dual diagnosis and challenging behaviour, based on the first seven admissions. All participants were admitted with high intensity, but low frequency aggression, self-injury and property destruction, along with less serious challenging behaviours such as yelling and threatening. Target behaviours decreased for all participants while in the treatment home. All were discharged successfully to family homes, group homes or supported apartments. Available data indicated that target behaviours and several social validity measures (e.g., police calls, hospital admissions) maintained at low levels up to one year in the follow-up location. Quality of life ratings improved, and consumer satisfaction was high. The findings from this program evaluation suggest that specialized community treatment homes may be an effective supplemental treatment model for individuals with dual diagnosis when other community resources are unable to support challenging behaviour.

Dual Diagnosis

Approximately 49% of persons with an intellectual disability (ID) have a dual diagnosis (Lunsky, Klein-Geltink, & Yates, 2013). Dual diagnosis is when individuals have an intellectual disability and a mental health issue, such as depression, bipolar or anxiety disorders, often accompanied by challenging behaviour, such as self-injury, aggression or property destruction (Charlot & Beasley, 2013; Feldman, Atkinson, Foti-Gervais, & Condillac, 2004; Gustafsson et al., 2009; McCarthy et al., 2010; Myrbakk & von Tetzchner, 2008). Specialized intervention services, including community interdisciplinary teams, behaviour support, specialized treatment homes and hospital inpatient units, have been established for persons with dual diagnosis (Chaplin, 2004; Davis, Barnhill, & Ateaz Saeed, 2008; Lunsky et al., 2010), yet, few studies have evaluated them. Typically, persons with dual diagnosis and challenging behaviour are admitted (or readmitted) to large inpatient mental health facilities for treatment in which positive outcomes have been reported (Lunsky et al., 2010; Xenitidis, Henry, Russell, Ward, & Murphy, 1999). However, there may be little follow-up and clinical support after discharge to the community, and behaviour control procedures implemented in the facility (e.g., seclusion, mechanical restraint) may not

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be feasible or appropriate for use in the community (Alexander et al., 2011; Asmus et al., 2004; Hagopian, Fisher, Thibault Sullivan, Acquisto, & LeBlanc, 1998; Kokoski, White, Lunskey, & Palucka, 2009; Luiselli, Lisowski, & Weiss, 1998; Lunskey et al., 2010; Merkel & Wiener, 1986; Xenitidis et al., 1999). Inpatient institutions are also associated with stigma and fear (Kumar, Guite, & Thornicroft, 2001).

Interventions for Persons with Dual Diagnosis Who Have Challenging Behaviour

Overall, challenging behaviour in persons with ID may be best understood using an integrated biopsychosocial approach that recognizes the interactive effects of biomedical, psychological, and social/environmental influences on challenging behaviour (Griffiths, Gardner, & Nugent, 1999; Hunter, Wilkniss, Gardner, & Silverstein, 2008). Treatments for individuals with dual diagnosis and challenging behaviour often use psychopharmacology and behavioural interventions. While there is general consensus that psychotropic medication is appropriate to treat mental illness in persons with dual diagnosis, evidence for its efficacy to manage challenging behaviour in the absence of mental illness is equivocal (Grey & Hastings, 2005; La Malfa, Lassi, Bertelli, & Castellani, 2006; Matson & Neal, 2009; Singh, Matson, Cooper, Dixon, & Sturmey, 2005). Behavioural interventions have a strong research base for the treatment of challenging behaviour in children and adults with ID (Feldman, Condillac, Tough, Hunt, & Griffiths, 2002; Grey & Hastings, 2005; Harvey, Boer, Meyer, & Evans, 2009). Behavioural interventions based on applied behaviour analysis (ABA) focus on the functional assessment of observable challenging behaviours to modify environments and teach functional replacement skills (Feldman et al., 2002; Harvey, Luiselli, & Wong, 2009).

Evaluations of Specialized Services

Community-based options and hospital care for persons with dual diagnosis now exist in some parts of North America and the United Kingdom (Davis, Barnhill & Atezaz, et al., 2008; Lunskey, Bradley, Dubin, & Koegl, 2008). The few existing evaluations of service programs for individuals with ID who have mental health

and behaviour problems generally support the benefits of both hospital (Hoefkens & Allen, 1990; Richings, Cook, & Roy, 2011; Xenitidis et al., 1999) and community-based specialized services (Clement & Bigby, 2011; McKenzie & Paterson, 2010; Rudolph, Lakin, Oslund, & Larson, 1998). In recognition of the high costs and weak generalization of treatment effects of inpatient hospitalizations, governments have started funding specialized community-based care (Davis et al., 2008; Lunskey et al., 2008). Outreach behaviour support services and temporary crisis unit placements may be more cost-effective than inpatient treatment for persons with dual diagnosis and challenging behaviour (Rudolph et al., 1998). For instance, Rudolph and colleagues projected that if behaviour support services were not available, an expenditure of \$9,000 per individual would be required for hospitalization and institutionalization over the same time period.

In response to the call for more program evaluations of community-based dual diagnosis programs (Davis et al., 2008; Gustafsson et al., 2009; Harvey et al., 2009), we conducted an outcome evaluation of a dual diagnosis interdisciplinary, specialized, publicly funded treatment home. We focused on changes in challenging behaviour in this setting. We included *in situ* behavioural observations and measures of social validity such as standardized behaviour checklists, incident reports that involved intrusive procedures or police involvement, and the impact of challenging behaviour on quality of life.

Methods

This evaluation received ethical clearance from the Brock University Research Ethics Board.

Setting

The Ontario government set up treatment homes as part of the regional networks of specialized care for persons with dual diagnosis in recognition that existing community ID services were struggling to maintain community placements of persons with dual diagnosis, particularly when they had challenging behaviour. The treatment home that is the focus of this study was designed to treat challenging behaviour in order to prevent hospital admission and to serve

as a transition from hospital to community care. The home consists of five beds, and is located in a rural setting in Central East Ontario operated by a local Community Living Association (CLA). CLAs are provincially funded, not-for-profit agencies that offer residential and other supports to persons with ID. Direct-care and interventions are provided by a team of seven full time and 15 part-time direct-care professional staff, and one residential supervisor; at least two staff are present 24 hours per day, seven days per week. The agency requires all full time staff in the agency to have a two-year community college diploma in a related field (e.g., Developmental Service Worker, Human Service Counselor). In this study, full-time staff had five to ten years of work experience related to intellectual disabilities. A treatment home is different than a typical group home in that all individuals have challenging behaviour, more behaviour supports exist, and the goal is to discharge individuals within one year to their previous/new group home, supported independent living, family home or other non-treatment residential setting. Occasionally, clients stay longer than one year, usually because a suitable discharge placement could not be found. This treatment home has an interdisciplinary team that provides assessment, treatment and evaluation. The team includes all of the aforementioned direct-care professionals, a residential supervisor (who work on site), a community nurse-clinician, and an on-site full time behaviour technician who reports to an external behaviour consultant whose work is overseen by a registered psychologist (who is also a Board Certified Behaviour Analyst). The direct-care staff, supervisor, community nurse clinician, on-site behaviour technician and the behaviour consultant meet at least once per week, and consult, with the psychologist approximately once per month. The behaviour consultant is on site one to two times per week, in addition to the weekly meeting. Access to case coordinators, family physicians, community psychiatrists, and other specialists is available as needed. Like other community homes for persons with ID, back up crisis services are available through psychiatric inpatient units at local hospitals and the dual diagnosis unit at a regional mental health facility.

Participants

When a referral was made to the regional network for a treatment home admission, an external committee, consisting of regional professionals (from a variety of disciplines including behaviour therapy, case management, community living, nursing, crisis intervention) determined if the individual was suitable for the treatment home, or if appropriate behaviour supports could be rendered in the current location through the local community behaviour support service. Each client had a physician and psychiatrist who provided consultation about the admission; and while physicians often supported the decision for admission to the treatment home, their approval was not mandatory for admission. Participants in this study were the first seven clients admitted to the specialized treatment home. All participants had high intensity, but low frequency aggression, self-injury or property destruction, along with less serious challenging behaviours such as yelling or threatening. Table 1 (page 72) provides a more detailed description of participants (names are pseudonyms), including setting prior to admission, diagnosis, medication, and target behaviour. Three individuals had Autism Spectrum Disorder, three had Mood or Anxiety Disorders, and one had Borderline Personality Disorder. Prior to admission, independent community psychiatrists and psychologists made the diagnoses seen in Table 1. These diagnoses did not change during their treatment period, nor were diagnoses reassessed after treatment. As seen in Table 2 (page 73), medication changes during treatment remained fairly stable. Most medication changes that did occur during treatment were decreases in dosages. Those participants who were prescribed Epival as a mood stabilizer received regular blood work and frequent monitoring by psychiatrists and physicians.

Design

A nonconcurrent multiple baseline design across participants (Watson & Workman, 1981) was used for the behavioural data and a pre-post design was used for the social validity data. In a nonconcurrent multiple baseline design, individual participant baseline-treatment time series data points are lined up in terms of con-

Table 1. Participants

| Name | Sex | Age (years) | ID level | Other Diagnoses ¹ | Pre-admission Placement | Target behaviours | Hypothesized Behaviour Function | Treatments | Current Placement |
|---------|-----|-------------|------------|---|-------------------------|---|---------------------------------|--|--|
| Jack | M | 18.9 | Severe | Autism Spectrum Disorder, Mood Disorder | Family Home | Aggression, Destruction, Yelling | Escape | social skills training, video modeling | Family Home |
| William | M | 50.1 | Severe | Mood/Anxiety Disorder NOS | Hospital | Aggression, Yelling | Attention Tangible | noncontingent attention, choices, | Group Home |
| Charles | M | 21.6 | Borderline | Asperger's Disorder, Obsessive Compulsive Disorder | Family Home | Aggression, Threatening, Destruction, Yelling | Escape | Adapted CBT, social skills training, video modeling | Family Home |
| Mary | F | 38.5 | Moderate | Borderline Personality Disorder | Supported Apartment | Aggression, Destruction, Suicide attempts, Yelling | Attention Escape | Adapted ACT, token economy, noncontingent attention; preferred activities schedule, choices, pre-admission) social skills training | Supported Apartment (same agency as pre-admission) |
| Sam | M | 32.7 | Borderline | Pervasive Development Disorder, NOS | Hospital | Aggression, Destruction, Yelling | Attention Tangible | social skills training, anger management training, self-management | Group Home |
| Dillon | M | 49.9 | Moderate | Mood/Anxiety Disorder NOS | Hospital | Aggression, Destruction, Elopement, Yelling, | Attention Tangible | social skills training, DRA, tolerance training for waiting for preferred activities and staff attention | Group Home |
| Pam | F | 34.7 | Moderate | Mood/Anxiety Disorder NOS | Group Home | Aggression, Destruction, Yelling | Attention Escape | anger management training, social skills training, self-management | Group Home (same agency as pre-admission) |

¹ Independent community diagnoses were completed prior to admission and not changed throughout the study

Note. NOS = Not Otherwise Specified; CBT = Cognitive Behavioural Therapy; ACT = Acceptance and Commitment Therapy; DRA = Differential Reinforcement of Alternative Behaviour

Table 2. Baseline Medications and Changes During Treatment for Challenging Behaviour

| Name | Baseline Medications | Medication Change | Figure 2 Data Point No. |
|---------|--|--|-------------------------|
| Jack | Propranolol, Haldol, Respiridol | No medication changes during baseline, treatment or follow-up | |
| William | Epival, Gabapentin, Olanzapine | No medication changes during baseline, treatment or follow-up | |
| Charles | Sertaline, Respiridol, Lorazepam (PRN only) | No medication changes during baseline, treatment or follow-up | |
| Mary | Seroquel, Clonazepam, Epival, Trazadone | Seroquel increase Clonazepam, Epival, Seroquel decreased | 5 17 |
| Sam | Epival, Zyprexa | No medication changes during baseline, treatment or follow-up | |
| Dillon | Clonazepam, Epival, Gabapentin, Lorazepam (PRN only) | Seroquel and Epival decrease Clonazepam and Epival decrease | 5 18 |
| Pam | Quetiapine, Clonazepam, Topimax, Lithium | No medication changes during baseline, treatment or follow-up | |

Note. Figure 2 data point no. refers to data point on Figure 2 in which medication changed for the participant.

secutive observation sessions, rather than by date. Experimental control of the intervention on target behaviours is shown when (a) participants' target behaviours at baseline do not substantially decrease while earlier participants are receiving treatment and showing improvements and (b) participants' target behaviours only improve when they receive treatment.

Measures

Functional behavioural assessment tools. Two widely used functional behavioural assessment rating scales were used to obtain caregiver perceptions of the functions of challenging behaviour (e.g., attention, tangible, escape, sensory): (1) *Motivational Assessment Scale* (MAS, Durand & Crimmins, 1992); and (2) *Functional Analysis Screening Tool* (FAST; Iwata, 1996). Two previous studies have reported acceptable internal consistency and scale interrater agreement on the MAS (Durand & Crimmins, 1988; Koritsas & Iacono, 2013). MAS, however, item-by-item agreement was weak (Koritsas & Iacono,

2013). MAS functions agreed with gold-standard analogue functional analysis (Iwata, Vollmer, & Zarcone, 1990) only 44% of the time (Paclawskyj, Kurtz, & O'Connor, 2004). FAST item-by-item interrater reliability was 72% and functions derived from FAST scores matched analogue functional analyses 64% of the time (Iwata, DeLeon & Roscoe, 2013). Given these results, the MAS and FAST were used to ascertain caregiver perceptions of possible functions, but descriptive functional behavioural assessment methods such as antecedent-behaviour-consequence logs recorded by direct-care staff and the on-site behaviour technician were used to derive likely hypothesized behavioural functions (Feldman et al., 2002). The participants' low frequency of severe destructive behaviours precluded the use of analog functional analysis (Iwata et al., 1990).

Behavioural observations. The primary outcome evaluation measure was change in observed frequency of target behaviours from baseline in the specialized treatment home (except for Charles whose baseline was in the

pre-admission home), to intervention (in the treatment home) and follow-up (in the residential placement following discharge). Caregivers (when available) conducted observations in the follow-up setting. The external behaviour consultant trained staff and caregivers to record the frequency of the target behaviours of each participant. Given the low frequency of target behaviours and clinical responsibilities of the on-site behaviour technician and external behaviour consultant, it was difficult to conduct frequent independent interobserver agreement (IOA) checks with treatment home staff. In total, 27 checks were made across clients (no IOAs were conducted in the discharge settings). Interobserver agreement was based on the total frequency of target behaviours during the observation period, with the smaller frequency divided by the larger frequency and converted into a percentage. IOA booster training was provided throughout the study to reduce observer drift and bias. The mean percentage IOA was 88% (range: 70% to 96%).

Social validity. In addition to direct observation, several social validity rating scales were completed by caregivers who knew the participants well (and sometimes by the participant, him/herself) before admission and after discharge from the specialized treatment home (except consumer satisfaction that was completed only after discharge). The *Behaviour Impact Questionnaire* was developed for this study, which measures the effect of challenging behaviour on (among other things) frequency of staff injury, hospital admissions and property damage. As a common focus of intervention is the improvement of social and coping skills, the standardized and norm-referenced *Social Skills Rating System* (SSRS; Gresham & Elliot, 1990) was used. The *Quality of Life Questionnaire* (Feldman et al., 2002) was completed by both the participant (when possible) and caregivers to rate the impact that challenging behaviour had on participants and others' quality of life in a variety of areas using a 7 point rating scale (1 = minimal impact and 7 = extreme impact). A lower score indicated that challenging behaviour was less problematic to quality of life. There were six items that asked how challenging behaviour affected opportunities for: (a) learning, (b) community integration, (c) friendships, (d) involvement in daily activities and routines, (e) inviting friends into the

home, and (f) attending social functions outside the home. A locally developed consumer satisfaction survey asked participants (when possible) and their caregivers to rate (on a 1 to 4 scale) their satisfaction with the six treatment home services: (1) admission application process; (2) forms requested prior to admission; (3) admission process; (4) admission day; (5) communication during treatment; and (6) quality of caregiver training upon discharge.

Procedure

Baseline. The overall home environment was set up to foster independence, effective coping strategies and appropriate behaviour in a positive, supportive, and respectful manner. When an individual came into the home, the external behaviour consultant, staff, and the client prepared a new person-directed plan. The external behaviour consultant and staff created a crisis plan that described de-escalation and safety responses when challenging behaviour posed risk of harm. Certified instructors trained all staff in government-approved "Safe Management Group" crisis intervention strategies (<http://safemanagement.org>) to be used as needed when harmful behaviour occurred to prevent and minimize injury.

The external behaviour consultant and consulting psychologist supervised biopsychosocial (Gardner, 2002), functional behavioural and reinforcer preference assessments (Cooper, Heron & Heward, 2007). Direct-care staff, the on-site behaviour technician, and the nurse-clinician provided input on these assessments based on observations and interviews conducted prior to, and at the time of, admission. The hypothesized function(s) of each target behaviour can be found in Table 1. While assessments were being conducted, staff collected baseline data on the target behaviours. Note that only Charles' baseline data was collected by his parents in the family home.

Treatment home intervention. Assessments led to the development of a positive behaviour support (PBS) plan and referrals to other professionals (e.g., psychiatrist, neurologist) as needed. The PBS plan was primarily based on functional behaviour and reinforcer preference assessments, and usually included antecedent strategies (e.g., providing opportunities for

choices), setting event strategies (e.g., promoting good sleep habits), and skill training and reinforcement strategies (e.g., visual schedules to promote independent performance, functional communication training, social skills training, and token economies) (Baker, 2003; Cooper et al., 2007; Feldman et al., 2002; Iwata et al., 2000; Koyama & Wang, 2011; Kuhn & Zelenka, 2010; Lanner, Nichols, Field, Hanson & Zone, 2009; LeBlanc, Hagopian, & Maglieri, 2000). Punishment procedures, such as response cost and time-out, were not used, although safe management strategies continued to be used for behaviour crises. Some participants received adapted (to their cognitive abilities) cognitive behaviour therapy (CBT), usually in the form of anger management (Rose, O'Brien, & Rose, 2009). Participants were taught to identify anger cues, triggers, and appropriate coping strategies using visual cues, modeling, roleplaying and *in situ* prompting and reinforcement (Nicoll, Beail, & Saxon, 2013). Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 2003), adapted for persons with ID (Brown & Hooper, 2009) was used with Mary only. A systematic review found that mindfulness-based interventions can significantly reduce behavioural and psychiatric problems in persons with ID (Hwang & Kearney, 2013). PBS plans were adjusted as needed, based on review of behavioural data and input from staff and the client. Staff were trained in the PBS Plan by the external behaviour consultant, who along with the on-site behaviour technician and residential supervisor, routinely (but informally) monitored treatment integrity and provided ongoing feedback to staff. The majority of pharmacotherapy interventions were in place prior to admission, and these interventions were monitored by psychiatrists and physicians on a regular basis throughout treatment.

Follow-up. Once a discharge residence had been identified, the PBS plan was modified, if necessary, so that it could be implemented in this setting. The external behavior consultant provided training to caregivers on the behaviour interventions and data collection, and coordinated with local follow-up services (e.g., community behaviour support service), as needed. The discharge group home and supported independent living staff had already been trained in crisis management. Family members who wanted crisis intervention training were

referred to agencies qualified to train families in Safe Management Group strategies. Table 1 outlines interventions for each participant. The behavioural consultant asked discharge caregivers to continue to collect behavioural data, and to complete the social validity measures up to 12 months post-discharge.

Results

Behavioural Results

Figure 1 presents the mean frequency of all target behaviours at baseline (Charles' baseline was collected in his family home), treatment, and follow-up (post-discharge setting) for the seven participants (no discharge data available for William and Pam). Challenging behaviour decreased for six of the seven participants. Sam's behaviour increased slightly during treatment from very low baseline rates (which may have been due to his responsiveness to the positive environment that was routinely in place), and the five individuals with follow-up data maintained treatment levels in the discharge residence. Caregivers of the two participants without follow-up data reported that participants' challenging behaviours remained low in post-treatment settings. The individuals and their caregivers (in the residence the individuals went to after discharge) reported high satisfaction with the treatment home experience and outcomes on the satisfaction survey. Figure 2 presents the multiple baseline results across the seven participants. As can be seen in Figure 2, reductions in monthly frequencies of challenging behaviours occurred when treatments were implemented in the specialized community home (except for Sam because of low baselines). When available, the follow-up data showed maintenance of treatment effects in the post-discharge environment. As the figures combine all target behaviours, we separated out severe challenging behaviours (self-injury, aggression, destruction, elopement and suicide attempts) from less intense, non-harmful behaviours (yelling, threatening). Across the seven participants, frequency of severe behaviours decreased from a monthly baseline mean of 2.14 to 0.62 during treatment to 0.18 at follow-up. Less intense behaviours decreased from a baseline mean of 7.32 to 3.77 during treatment and went up somewhat to 4.02 at

follow-up. Medication changes are noted in Table 2 with reference to months depicted in Figure 2. Mary's behaviour increased in the month following a decrease in Clonazepam, Epival, and Seroquel, but then behaviour decreased the following month with no further medication changes. Dillon showed no obvious effect of decreases in Seroquel, Epival and Clonazepam. No other participants had medication changes during the study.

Social Validity

Despite several requests, post-discharge behavioural and social validity questionnaire data were not consistently obtained from caregivers in the participants' follow-up placements. Below, we present available behavioural and social validity data on four participants.

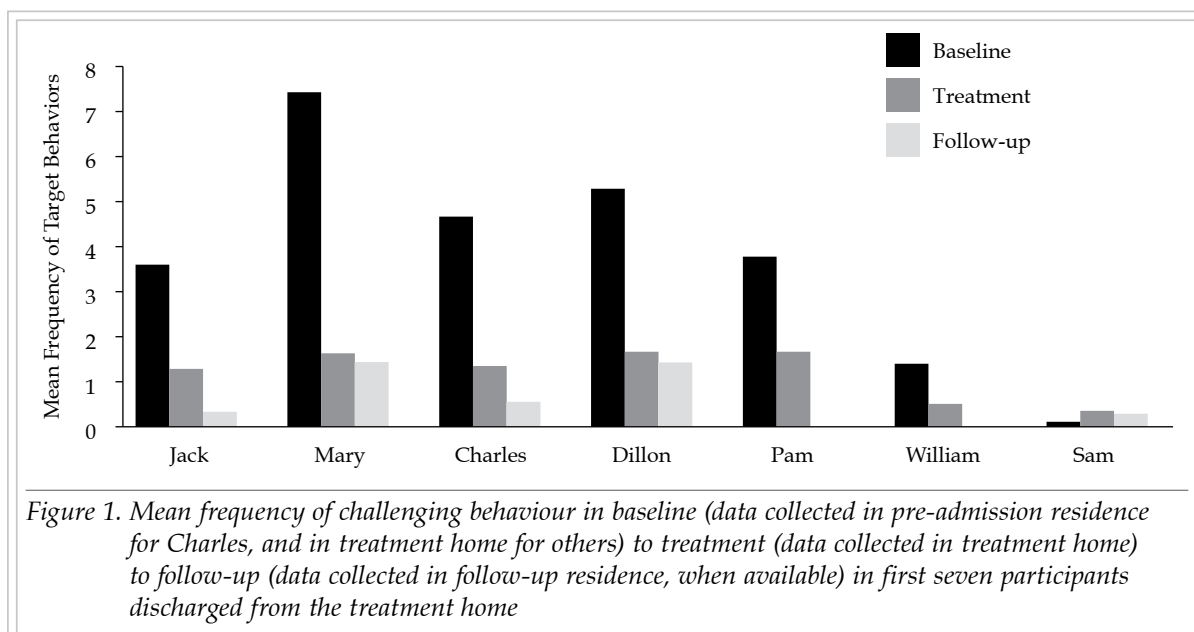
Jack. No physical aggression occurred during the two-month follow-up period. A treatment home staff person who knew Jack well completed the SSRS during baseline and just prior to discharge. Jack's baseline SSRS subscale scores were all "Fewer" (exhibits fewer social skills than the mean), but three of the six subscales improved to "Average" (exhibits as many social skills as the mean).

Charles. At time of discharge, no physical aggression had occurred for 15 weeks in the treatment home. Subsequently, no severe prob-

lem behaviour was reported in the community for four months after discharge. The Behaviour Impact Questionnaire showed a pre-admission to follow-up decrease in several key outcomes: (1) police contacts - 4 to 0; (2) hospital emergency room visits and admissions - 10 to 0; (3) personal injury to self and others - 2 to 0; and (4) property damage estimated repair/replacement cost - \$2,500 to \$250. Charles' Quality of Life Questionnaire (Feldman, et al., 2002) scores, completed by his parents, decreased from a pre-admission mean of 5.4 to a 12-month follow-up mean of 2.3, signifying improvement. Noteworthy changes from this questionnaire included increased opportunities to become involved in activities, for his family to have friends to the home, and attendance at social functions outside the home.

Mary. During the follow-up period, a decrease in problem behaviour was maintained during the first 7 months after discharge, but then there was a temporary increase in yelling that may have been due to relationship issues with her boyfriend. Mary's target behaviours frequencies returned to treatment levels upon resolution of these issues.

Dillon. Although Dillon was ready for discharge after one year, it took another 18 months to find a community agency willing to offer him a residential placement. The Quality of Life Questionnaire (Feldman, et al., 2002) showed a



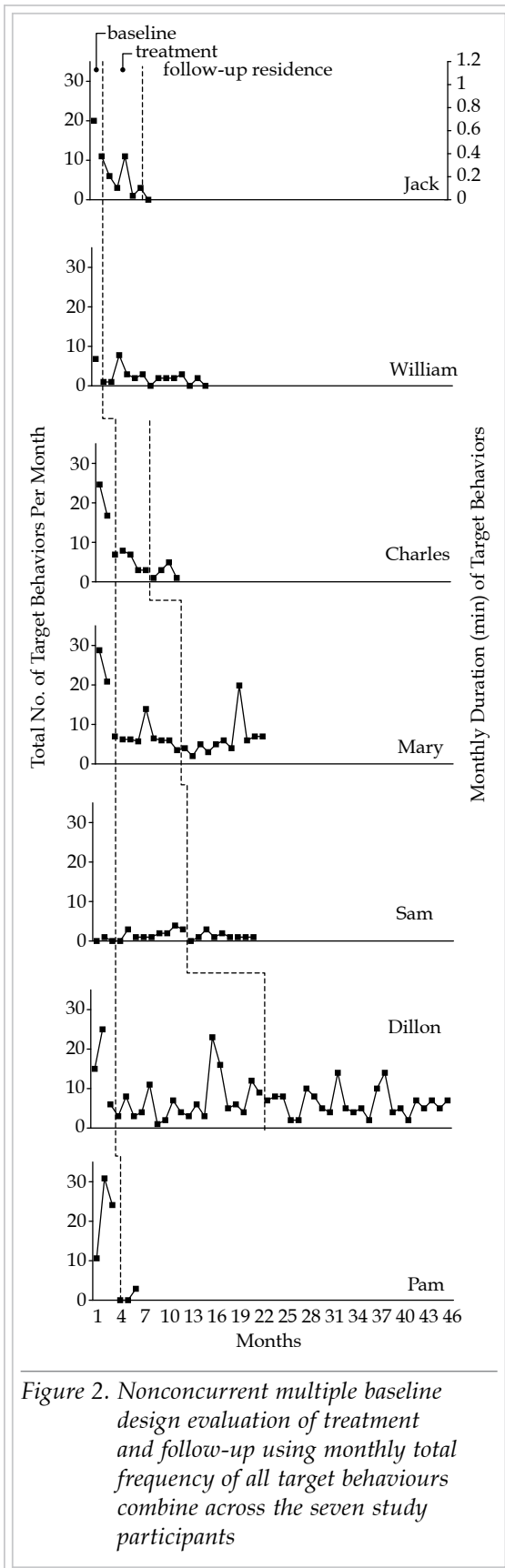


Figure 2. Nonconcurrent multiple baseline design evaluation of treatment and follow-up using monthly total frequency of all target behaviours combine across the seven study participants

pre-admission to follow-up decrease in overall mean score from 3.25 to 1.75, respectively, indicating that challenging behaviour had less of a negative impact on quality of life. The biggest quality of life improvements were in friendships, community integration and caregiver/housemate stress.

Discussion

This preliminary evaluation of an interdisciplinary specialized community treatment home suggests positive experiences for individuals residing in the home, and that this type of support may be effective in reducing severe challenging behaviour and improving quality of life for individuals with dual diagnosis and challenging behaviour during treatment and after discharge. Individuals with a dual diagnosis and challenging behaviour often tax the resources of typical community and family home placements. They have complex and varied needs that often go unmet in many traditional systems of care such as hospital and institutional type settings (Lunsky et al., 2010). Individuals with dual diagnosis and challenging behaviour are often excluded from participation in community living activities (Rudolph et al., 1998; Sawyer, Lake, Lunsky, Liu, & Desarkar, 2014). With changes in policy directives and the closure of institutions, effective specialized services are needed that respond to the unique mental health and behavioural needs of persons with dual diagnosis and challenging behaviour (Davis et al., 2008; Lunsky et al., 2008; Lunsky et al., 2010).

The present study adds to the literature on program evaluations for specialized community services. Rudolph et al. (1998) found that a short-term community treatment program was a more cost-effective alternative to hospitalization and institutionalization. A review of the treatment home’s budget revealed an annual cost per individual of \$169,000. This amount compares quite favourably to the annual cost of maintaining an individual in an Ontario mental health hospital - \$334,125 (KPMG, 2012). Furthermore, relocating persons with dual diagnosis and challenging behaviour from institutional settings to community-based service settings is associated with increases in domestic skills, decreases in challenging behaviour, improvements in quality of life,

higher levels of engagement in meaningful activities, and higher levels of contact with staff (Golding, Emerson, & Thornton, 2005).

The positive findings of this study suggest that despite concerns that grouping several individuals with challenging behaviour may exacerbate such behaviours (Golding et al., 2005), having additional clinical supports, staff training and expertise in positive behaviour support and ABA, and management focus in one location, such as a specialized community-based behavioural support residence, may be an effective option when community placements breakdown (Mansell, Beadle-Brown, Macdonald, & Ashman, 2003).

Given the difficulty of repeat admissions from specialized inpatient hospital units to nontreatment oriented community or family residences (McKenzie & Paterson, 2010; Richings et al., 2011), it is encouraging that all but one (Dillon) of the seven individuals were discharged successfully from the community treatment home within the one-year admission time frame. Dillon was eventually reintegrated into the community once a willing community placement was found. For the most part, participants maintained low levels of challenging behaviour up to 12 months in their follow-up placements, and the social validity results (when available) generally supported behavioural observations.

This study contributes to research in the treatment of persons with dual diagnosis and challenging behaviour by including a single-case experimental design, multiple outcome measures, a range of interventions, and promising follow-up and social validity data. Nonetheless, the findings should be considered preliminary because of the small sample size, inconsistent return of follow-up data and questionnaires, small number of IOA checks, no formal mediator treatment integrity data, and the inability to separate effects of PBS and pharmacotherapy interventions on challenging behaviour. Another limitation of this study is that there was a maximum of three baseline points for the multiple baseline design. As this study was an evaluation of a publicly-funded treatment service, not a research demonstration project, we could not justify extending baseline beyond the assessment period to generate a better multiple baseline design, as all clients were exhibiting severe challenging behaviour. The nonconcurrent mul-

iple baseline design ostensibly did not control for exposure to similar extraneous events during the different phases that could mimic treatment effects. However, William, Mary and Dillon were admitted within one month of each other, and the pairs of Jack and William and Pam and Charles were admitted within two months of each other, respectively. Therefore, these groupings did experience similar events. A strength of the nonconcurrent design due to the distribution of admissions over a two-year period shows that treatment effects likely were not strongly influenced by seasonal and staff changes. Since the completion of the study, four additional admissions have been successfully returned to community group homes and supported apartments.

Conclusion

The present study demonstrated that a specialized community treatment home was able to decrease challenging behaviour in seven persons with dual diagnosis such that they were successfully discharged to nontreatment residential settings. Although various empirically supported interventions exist for persons with intellectual disability who have mental health and behavioural issues, more research is needed to determine the most effective and efficient treatment models and service delivery programs for individuals with dual diagnosis. Future evaluations should use experimental designs, component analyses (such as comparing behavioural and psychotropic interventions) and cost-effectiveness models with larger samples over a longer follow-up period to determine the effectiveness and efficiency of different models and interventions (e.g., comparing a treatment home model to community behaviour support services).

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Key Messages From This Article

People with disabilities: If you have mental health concerns, it may be possible to receive help in a home located in the community rather than go to a hospital.

Professionals: Community-based specialized treatment homes for persons with dual diagnosis (ID, mental health concerns and challenging behaviour) may be a cost-effective alternative to hospitalization.

Policymakers: Policies to promote expansion of community-based behavioural supports may reduce suffering and costs associated with dual diagnosis and challenging behaviour.

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