

The Trajectory of Change for Children and Youth in Residential Treatment

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Abstract This study examined the symptom response trajectories for 225 children and youth throughout a period of residential treatment. With the 10-item *Conners' Global Index (CGI)* as the primary outcome measure, assessments were completed on a bi-weekly basis during the average 4 month stay within the youth's residential treatment. Clients demonstrated an ongoing reduction of symptoms, and the severity of baseline symptoms influenced the trajectory of the symptom reduction. In addition, symptom reduction was characterized as logarithmic, particularly when controlling for the baseline severity of symptoms. Implications of these findings for administrators, practitioners, and researchers of residential treatment are discussed.

Keywords Child · Youth · Treatment · Mental health · Longitudinal · Trajectory

Residential treatment is among the most expensive components of the mental health system for children and youth [1], and although several large scale reviews indicate that a period of residential treatment can improve functioning for children and youth that have serious behavioural and emotional disorders [2–4], uncertainty remains regarding the trajectory through which symptom change occurs within these settings [5]. In particular, the length of stay in treatment appears to be a particularly contentious issue, with duration of residential programs ranging from a few months [6], to a few years [5]. There is, however, a noteworthy lack of concern within the literature, regarding the point at which

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youth in treatment begin to demonstrate a change in their symptom trajectory. For example, although controversy exists concerning the influence of age on the within-treatment trajectory [7, 8], with few exceptions, most studies investigating residential treatment rely solely on pre-post measures of treatment effectiveness [2] and largely ignore within-treatment trajectories. Thus, while it remains important to demonstrate that residential treatment works (i.e., that substantive reductions in symptoms can, and do, occur), it is highly relevant to both practitioners and policy makers to demonstrate *how* it works—and *when* these treatments reach what could be characterized as the point of maximum symptom reduction [4]. The present study focused on answering the question “*when, during treatment, is the point of maximum symptom reduction*” by identifying the trajectory of symptom change for children and youth in a voluntary intensive inpatient mental health treatment program.

Residential treatment programs for children and youth are characterized as out-of-home, twenty-four-hour facilities, that vary by therapeutic modalities, placement settings, program components, and treatment populations [9]. The outcome literature related to residential treatment is limited to half a dozen studies over the past decade, and research has all but ignored within-treatment trajectories of change [2]. Although pre-post studies are useful in projecting potential end-points in the trajectories, they do not address changes that occur between admission and discharge.

A period of residential treatment has been found to reduce symptoms at discharge to a sub-clinical threshold as compared with pre-admission levels [2–4, 8]. The available literature suggests, however, that there can be differential change trajectories relative to the degree of presenting symptoms, specific client/family characteristics, and treatment program or agency. Hussey and Guo [10] noted that the children with the highest critical pathology at admission had the slowest rate of change measured at discharge. Conversely, the group with the lowest critical pathology at the first time point had the fastest rate of discharge. Across the state of Illinois, variability in length of stay was best understood as a function of the hospital setting chosen for treatment [11].

Dose–effect relationships with outcome suggest that if a service is effective, then *more* of the service should yield even *greater* effects [5]. More specifically, the common usage of the term ‘dosage effect’ in the adult outpatient mental health literature suggests that patient improvement occurs as a log-linear function based on the number of treatment sessions, with the greater extent of improvement occurring at an early point in treatment while slowly decelerating over time [12]. Subsequent research from the adult outpatient literature has demonstrated the dose–effect relationship for cases of depression [13], interpersonal problems [14], and for therapy in clients with intellectual disability [15]. As previously cited, however, little research or theory exists to examine such a relationship for children within residential treatment [9].

In one of the few studies that have attempted to measure dosage effects in child and youth tertiary mental health treatment, Green et al. [6] noted that longer residential stays were associated with more significant behavioural and emotional improvements. Similar outcomes have also been reported by Swadi and Bobier [16] and Shapiro, Welker, and Pierce [17]. The findings of Shapiro et al. [17] are significant, as they indicate a plateau of improvement between 3 and 6 months following admission to treatment. This may be the point in time when symptom reduction has decelerated to a rate that statistically resembles a plateau. Other studies have reported that a similar plateau occurred after 30 days of residential treatment [18], or between 30 and 90 days of residential treatment [9].

Investigations of this kind would have considerable policy implications. For example, if the symptom reduction occurs shortly following admission and then plateaus, such

outcomes could influence decisions regarding the length of time that a child should be maintained in a residential program. Alternatively, residential treatment centres could improve their outcome management strategies by comparing a child's actual response to treatment based on their expected response. If certain children/youth fell below an expected treatment response, then alternative strategies might be employed to improve the potential for a positive outcome. Such an approach to outcome management is reflected in the adult mental health outpatient literature [19] and needs to be addressed within the children's mental health research area.

In summary, identifying the point of plateau, based on specific client characteristics (e.g., baseline severity of symptoms) among residential samples is useful when planning for the transition to in-home or outpatient treatment in the community. The present study investigated the within-treatment symptom trajectories for children and youth in residential treatment. In particular, the timing of when change occurs to a significant extent and what the precursors were in terms of the seriousness of symptoms on admission were considered.

Method

Participants

Research participants were recruited using a consecutive sampling strategy (between October 2002 and July 2005), and included children and youth admitted voluntarily into residential treatment within a large mental health treatment centre in Ontario, Canada. Of the 225 participants sampled, 75.6% were male ($n = 170$) and 24.4% were female ($n = 55$). The age range was 6 to 17 years ($M = 11.72$; $SD = 2.55$).

Referrals for treatment were screened through one of ten Single Point Access Centres within the large catchment area of the residential treatment centre. Children who were admitted were screened through these Access Centres, to ensure that only those with high risk of home and school breakdowns were admitted as inpatients, with all others served by outpatient mental health services. Based on the Brief Child and Family Phone Interview (BCFPI), these children and youth registered elevated externalizing and internalizing mental health scores, having a mean pre-treatment externalizing score of 82.9, and a mean internalizing score of 71.05.

This sample is tertiary care in nature. That is, they are high needs in multiple areas of home and school functioning, coupled with multiple risks of maladaptive functioning across interpersonal and individual domains. Guardians reported that historically they had first sought outpatient services for emotional/behavioural concerns for their child at (on average) 6 years of age. At the time of admission, participants resided: with either a parent or a guardian (68%; $n = 153$); with extended family (5.3%; $n = 12$); in a group home (12.4%; $n = 28$); in foster care (10.7%; $n = 24$); in other residential care (2.7%; $n = 6$); or in youth custody (0.9%; $n = 2$). Slightly more than half (50.2%) of the sample was involved with their local Children's Aid Society prior to admission; 17.8% were under the guardianship of the Children's Aid Society; and 32.4% remained under the care of a separate guardian while receiving services from the Children's Aid Society. The prevalence of maltreatment within this sample was measured using the Brief Child and Family Phone Interview (BCFPI) [20]. Fifty-six percent had witnessed verbal or physical violence, 30% had been physically abused, 25% had been neglected, and 19% had been sexually abused. All participants involved had received at least one psychiatric diagnosis, and 94% were receiving psychotropic medication at the time of admission.

Unique to this tertiary care provider, attempts were made in all cases to have participants return home from inpatient treatment each weekend, and on holidays. From a measurement perspective, this model of service ensured that ongoing parental reports were based on current observations of functioning. Children and youth admitted into this tertiary care mental health facility received assessment, treatment, and individualized care plans developed collaboratively by the family/guardian, community case manager, and clinicians at the Centre. The professions of psychiatry, psychology, social work and childcare represented the clinical team. Case plans were formally reviewed on a monthly basis. Treatment was based on current best practice, drawing on structured behavioural milieu and individualized intervention strategies. The average length of stay was 4 months and outpatient services were provided during the immediate post-discharge period. The nature of the psychiatric milieu therapy program, multidisciplinary supports, and onsite school, along with a broader assessment of sampling characteristics and client outcomes is available from the authors. The treatment program described by Green et al. [6] best matches the major characteristics of the present inpatient service.

Measures

Conners' Global Index—Parent (CGI-P)

Previously known as the Hyperactivity Index, or the Abbreviated Symptom Questionnaire, the Conners' Rating Scales—Revised [21] CGI scale consists of 10 items that provide a sensitive method for monitoring response to treatment and for determining when behaviours of interest are within normal limits [22]. Reliability of this measure is reflected by coefficient alphas ranging from 0.86 to 0.94 [21]. Normative data exists for males and females aged 3–17 based on a sample size of approximately 8,000. In the present study, respondents were the most knowledgeable adult in the lives of these children—typically a parent, or a foster caregiver. These individuals were asked, every 2 weeks, to indicate how much of a problem (not true at all, just a little, pretty much true, very much true) each of the items had been for the child/youth. The CGI was chosen by this mental health agency as a rapid, ongoing screening of basic behaviour and mood concerns based on common usage in the field, known reliability and validity, demonstrated treatment outcome sensitivity (including response to medication dosage effects), and the ability to distinguish clinical behaviour, mood, and control participants [23, 24]. Importantly, effects of repeated administration on the observer has been documented in the literature [25, 26]. A parallel 10-item teacher version (CGI-T) was also used during the treatment stay, with preadmission classroom functioning assessed by the longer Conners' Teacher Rating Scale [21]. The client's primary inpatient child and youth counsellor also rated participants with the CGI-P every other week.

The Brief Child and Family Phone Interview (BCFPI)

The BCFPI [20] is a structured telephone interview that was completed with the child's caregiver, at the time of referral. The BCFPI is administered to children 3–18 years of age [20] and resulting raw scores are standardized to provide norm-referenced data on externalizing, internalizing, family, and individual factor subscales. Content validity of the measure was based on mapping selected items onto the DSM-IV criteria. Norms are based on Ontario child and youth samples. Standardized scale (*T*) scores provide normative data on subscale factors describing externalizing, internalizing, family and individual

functioning factors. Internal consistency reliability scores indicated adequate reliability, especially given that this brief screening instrument consists of a few items per factor. Alpha coefficients for the major scales on the BCFPI reflected the following: ADHD ($\alpha = 0.82$), oppositional behaviour ($\alpha = 0.83$), conduct problems ($\alpha = 0.68$), separation anxiety ($\alpha = 0.78$), anxiety ($\alpha = 0.78$), depression ($\alpha = 0.84$), with the 18 item composite externalizing ($\alpha = 0.86$) and internalizing scales ($\alpha = 0.85$).

The Social Skills Rating System (SSRS)

The SSRS [27] allows parents and teachers to rate children and youth across different age ranges on their social behaviour, problem behaviour, and academic standing. Diperna and Volpe [28] report that the SSRS has shown sound psychometric properties with subscale coefficient alphas ranging from 0.74 to 0.93, and with studies reflecting criterion, content, and construct validity offering support for the validity of the SSRS.

The Parenting Stress Index (PSI)—Short Form

The PSI [29] total stress score provides an indication of the overall level of parental stress, and reflects additional stress in the following areas: stress derived from the parent's interactions with the child, personal parental distress, and stresses that result from the behavioural characteristics of the child. Lloyd and Abidin [30] report a high degree of internal consistency for the child domain (0.89), the parent domain (0.93), and the total stress score (0.95).

Results

Baseline Function

This sample presented with an extreme degree of psychopathology and life skill deficits according to multiple raters and reports. On the BCFPI, caregivers reported clinically elevated symptoms for their child on all indices of both an externalizing and internalizing nature, mood/self-harm, total mental health, and global child interpersonal functioning. The overall preadmission externalizing scores evidenced extreme concerns with behaviour (mean T -score = 83, $SD = 9.60$). In addition, caregivers reported their own global family functioning as being in the clinically elevated range on the Parenting Stress Index (PSI) [29]. The total parenting stress raw score of 118 ($SD = 22$; $n = 185$), indicated parenting stress above the 99th percentile.

The extent to which this sample experienced extreme distress is also reflected in the nature and number of psychiatric diagnoses upon admission. Co-morbidity of diagnoses at admission was reflected in 86% of the participants, with 68% of participants having three or more psychiatric diagnoses. Eighty-five percent of the sample had an admission diagnosis of a disruptive behaviour disorder reflected in an Attention Deficit Disorder (ADHD), Oppositional Defiance Disorder (ODD), and/or Conduct Disorder.

Prior to admission, community teachers were asked to rate the school functioning of participants, using the Conners' Teacher Rating Scale (CTRS) [21]. Oppositional Behaviour in the classroom was extreme with a mean T score = 87. In addition, these teachers ($n = 150$) rated the academic performance of these students to be more than one

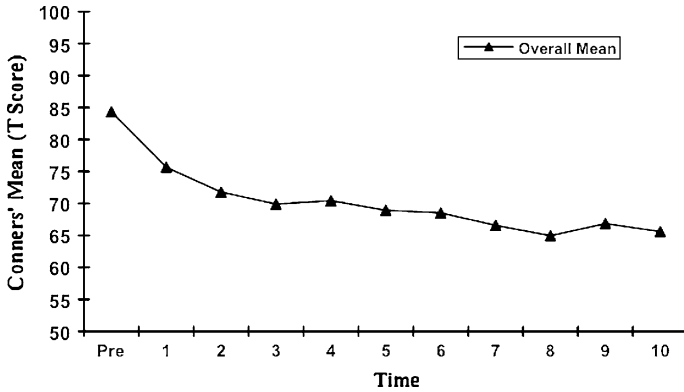


Fig. 1 Overall mean on the Conners' Parent Scale (*T*-score). Each time period corresponds to 2 weeks in treatment

standard deviation below that of their same-age peers (mean standard score = 82) on the Social Skills Rating Scale (SSRS) [27].

The first set of analyses within this study explored the potential reduction of symptoms during the child/youth's residential treatment stay, using the Conners' Parent Rating form. Figure 1 reflects the overall trend towards a decrease in symptoms across the trajectory, with scores generally moving from the clinical ($T > 70$) to nonclinical range ($T = 65$ by time period 8).

The second set of analyses focused on the changes in parent-rated symptom trajectory (as measured using the Conners' Parent Rating form) based on the participant's initial scores on the BCFPI at admission. A two-step cluster method was used to divide the sample into two groups: those with significantly higher-than-average pre-admission *T* scores ($M = 90.45$, $N = 149$,) and those with significantly lower-than-average pre-admission scores ($M = 72.34$, $N = 76$). Table 1 summarizes the overall means for both clusters across the trajectory. The cluster of individuals with lower than average pre-admission scores remained lower across the trajectory and at discharge. Conversely, those individuals with higher than average pre-admission scores remained higher across the trajectory, and at discharge from treatment. Figure 2 provides a visual representation of this relationship.

The third set of analyses explored the treatment dosage effect. In order to test for dosage effects, a person by period representation of the data was created, and time was regressed onto Parent, Teacher, and Staff ratings of the participant's symptoms. Curve-fitting analyses were used to determine whether the trajectory was best fit with a linear, quadratic, or logarithmic curve. The results of these analyses suggested that the trajectory of both teacher and staff reports was not significantly different from zero under any of these regression models, suggesting that average scores on teacher and staff reports do not change significantly over the course of treatment. Mean teacher responses to the 10 item scale found scores to be within the subclinical range ($T < 70$), possessing substantial inter-subject variability. The mean scores tended to undergo a small increase after the first observation, which was then followed by little change (mean time 1 $T = 63.8$, with subsequent average scores ranging between 66.1 and 68.8). Staff ratings on the CGI-P demonstrate the same pattern (mean time 1 $T = 62.1$, remaining scores average between 65.1 and 66.5). In contrast, parent reports of symptoms showed non-significant linear

Table 1 Conners' parent rating of symptoms for high versus low pre-admission symptom clusters

Time	Low cluster <i>N</i>	Low <i>T</i> score (mean)	Total sample <i>N</i>	Total S. <i>T</i> score (mean)	High cluster <i>N</i>	High <i>T</i> score (mean)
Pre	76	72.34	225	84.33	149	90.45
1	68	69.19	192	75.66	124	79.21
2	67	65.67	187	71.77	120	75.18
3	67	63.82	185	69.89	118	73.34
4	66	65.73	186	70.42	120	73.01
5	61	63.70	165	68.94	104	72.01
6	57	64.07	152	68.53	95	71.21
7	44	60.52	130	66.58	86	69.67
8	38	60.74	102	64.96	64	67.47
9	26	61.46	70	66.86	44	70.05
10	18	62.11	52	65.60	34	67.44
11	8	60.62	28	65.21	20	67.05
12	7	70.57	20	68.20	13	66.92
13	5	70.20	12	69.83	7	69.57
14	2	71.50	6	76.17	4	78.50
15	3	68.67	7	72.29	4	75.00
16	3	62.33	6	64.67	3	67.00
17	2	70.50	4	70.75	2	71.00
18	1	70.00	2	74.00	1	78.00

Each time period corresponds to 2 weeks in treatment

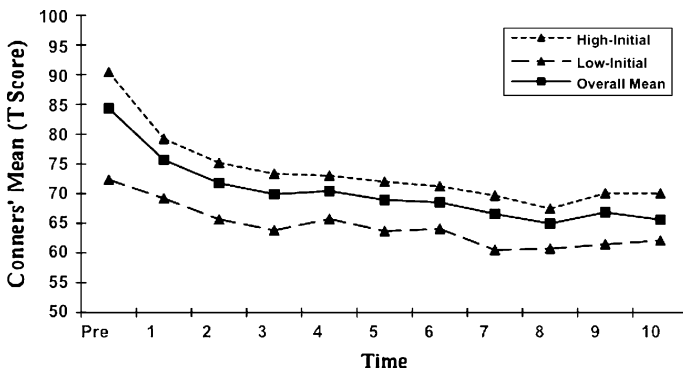


Fig. 2 High versus low pre-admission symptom clusters on the Conners' Parent Scale (*T*-score). Each time period corresponds to 2 weeks in treatment

$[t(81) = 1.49, p = 0.139]$ and quadratic $[F(2,80) = 0.178]$ trajectories, but did demonstrate a logarithmic trajectory curve that approached statistical significance $[t(81) = 1.81, p = 0.074]$. This logarithmic curve is portrayed graphically in Fig. 3.

Given the relationship between the baseline pre-admission severity of symptoms and overall trajectory (see Fig. 2), a second curve-fitting analysis was conducted on the parent ratings to determine the impact of pre-admission symptoms on the shape of the overall curve. Results of this analysis revealed that the revised quadratic model was non-

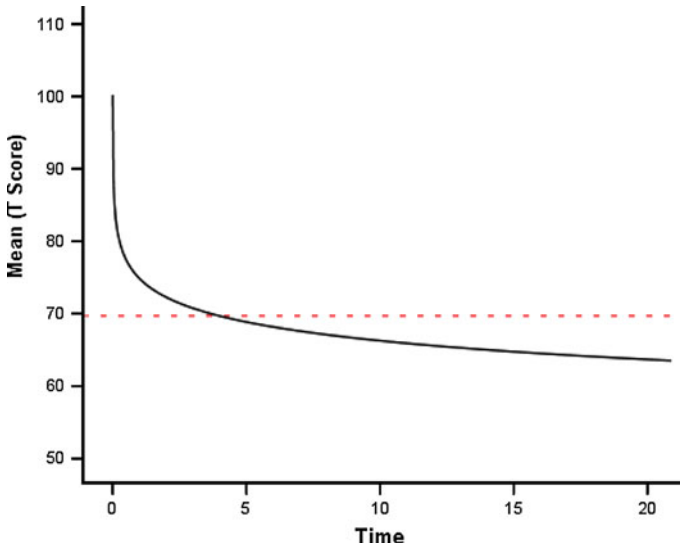


Fig. 3 Logarithmic Curve for Conner's Parent Scale ratings (*T*-score). Each time period corresponds to 2 weeks in treatment

significant [$F(2,80) = 0.783$], while the revised linear [$t(81) = 4.03$, $p < .001$] and logarithmic [$t(81) = 3.894$, $p < .001$] models were each statistically significant.

In an effort to better understand the unconfounded underlying trajectory, a new variable was created using the unstandardized residual score from the baseline severity curve fit analysis. This new variable represented all of the variability in parent ratings that was unrelated to the ratings at pre-admission. Using this variable's residual score, the curve was again estimated for parent ratings using linear, quadratic, and logarithmic functions. The results of this analysis yielded the following results: linear [$t(81) = 1.654$, $p = .102$], quadratic [$F(2,80) = 2.07$, $p = .33$], and logarithmic [$t(81) = 1.983$, $p < .05$]. This suggests that the most parsimonious regression model for the trajectory of symptom change over time is logarithmic.

Note in Table 1, that by 16 weeks inpatient (time period 8), well over half the sample had been discharged, with sample size falling rapidly in the weeks that followed. During the preadmission phase, clinicians at this agency routinely informed families that 4 months was the estimated length of anticipated treatment, and written inpatient plans of care documented this date for goal attainment targets. It is not, therefore, surprising that the average length of stay was roughly 16 weeks. Clients requiring longer than this period of treatment would be expected to be: (a) unsupported by their home and community (i.e., an inadequate support plan delayed discharge); and/or (b) unresponsive to treatment. Visual inspection of the logarithmic function in Fig. 3 reveals an apparent plateau at approximately the 16th week in treatment. Nevertheless, given the rapid deceleration of symptom severity prior to the 6-week point of treatment, paired samples *t*-tests were conducted to determine whether any significant reductions in symptoms occurred after this point. In addition, Fig. 1 may display a slightly higher mean score in subjects remaining after 16 weeks of treatment, as anticipated by the treatment unresponsiveness hypothesis, and so additional paired samples *t*-tests were conducted to test the statistical significance of this symptom change. Given the potential for multiple comparison bias, a Bonferroni

($\alpha/7 = 0.007$) correction was utilized. Significant differences were found only between times 3 and 7 [$t(116) = 3.90, p < .007$] and between times 3 and 8 [$t(89) = 5.04, p < .007$]. Thus, despite the drastic reduction in symptoms by the 6th week in treatment (time 3), significant symptom reduction occurred until the 14th week in treatment (time 7). This treatment effect appears to be maintained over time, as the differences from times 8 and 9 and times 8 and 10 indicate that symptom resurgence was statistically non-significant.

Discussion

This study investigated the symptom trajectories in a residential treatment facility for seriously behaviourally and emotionally disordered children and youth. Bi-weekly Conners' Parent, Teacher, and Staff report of symptoms were utilized in the analysis. The parent report of symptoms indicated that a period of residential treatment had a significant impact on symptom reduction. In contrast, residential staff and teacher reports were not indicative of average overall change during the inpatient stage of service. The parent report of symptoms provided evidence for the existence of a 'dosage effect' with large initial reductions and slower subsequent reductions in symptom severity. In addition, pre-admission (i.e., baseline) severity of symptoms had a significant impact on the overall within-treatment trajectory and strengthened the presence of the overall dosage effect.

While there is over 30 years of research in the adult outpatient treatment literature [12], little research or theory exists to support the existence of a 'dosage effect' for children and youth in residential treatment. The existing residential treatment literature does reflect that the majority of symptoms are reduced during the first 3 weeks [16] or 30 days [9, 18] of treatment. The infrequent assessment periods used within previous studies do not, however, allow for a sensitive assessment of symptom change. Drawing on the bi-weekly assessment of symptoms within the present study, a clearer view of the trajectory through which symptom change is achieved was detected. Symptom reduction in the present sample occurred on a logarithmic curve, with the largest gains made at an early stage in treatment and a slow, but statistically significant deceleration thereafter. Using curve estimation techniques, the logarithmic curve closely approached statistical significance and was significant at the .05 level after controlling for the pre-admission severity of symptoms. Therefore, the results of this study are consistent with the adult outpatient literature and with some existing residential treatment literature in supporting the existence of a dosage effect.

From a practical standpoint, it is important to appreciate that the children who entered treatment with a comparatively higher severity of symptoms were still likely to exit treatment with greater severity of symptoms. Having this knowledge in advance allows additional time to plan for the intensive outpatient supports that are likely to be of particular benefit to this group. It is important for researchers to appreciate that controlling for pre-admission symptoms is necessary for understanding the underlying, unconfounded, symptom trajectory. More specifically, it is important to statistically control for baseline severity when attempting to study the impact of other characteristics such as age or sex on the within-treatment trajectory. An additional implication of this study relates to the logarithmic or dosage effect response to treatment. In particular, it is important for administrators of residential treatment centres to appreciate that significant reductions in symptoms continue to occur *until the intended completion of the treatment*, which in the present context was 16 weeks. While the period of greatest symptom reduction occurs

early in treatment, parental reports suggest that there continue to be significant reductions that follow. Clients who stay beyond the intended completion of treatment may be less likely to follow this function, depending on the reasons their treatment was extended.

Several concerns with the present methodology should, however, be underscored. The 10-item Conners, albeit one of the most widely used monitoring tools over the past four decades, is not without psychometric criticism [e.g., 23]. Although this measure is valuable as a rapid evaluation of the two primary concerns in this inpatient sample [24], it should not be seen as a proxy for clinical measurements of treatment outcome. Clinical measurement of treatment outcome in the present sample was monitored post-discharge by additional measures of adaptive behaviour and impairment, such as ongoing mental health contact, school service assignments, and police contact.

Although an excellent response rate (67%) was obtained within the teacher reports, this data was collected voluntarily, and so it is conceivable that non-responders may have had differing opinions, as compared with responders. As we expect this data to be missing at random, however, we believe that this will have a marginal effect on the interpretation of the data. The lack of statistically significant CGI mean score change over time across teachers and staff is noteworthy. Generally, inpatient staff/teacher ratings were notably lower than parent ratings, which is likely a function of the protected treatment environment, the use of seasoned clinical observers in making ratings (i.e., they hold ‘clinical norms’ in their heads, rather than ‘population norms’), and the clinician’s lack of history with the child. Clinician’s first CGI rating represents a ‘first impression’ after working only a few hours with the child, in contrast to the parental rating which is expected to indicate intimate knowledge, and many months of distress and desire for service. Over time, as the teacher and staff get to know the child, their ratings are based on more and more samples of observations, with significant contextual variation considered (e.g., assessment of medication trials, ever changing peer cohort on the treatment unit, increased expectations of skill attainment, etc.). Diamond and Deane [25] used repeated measurements of this same 10 item Conners scale with teachers over 7 weeks in a nonclinical sample, and found that after an initial mean score drop across observation one to observation three, average scores then rose over time. The test–retest reliability correlations remained strong, as they did not find any instability in the rank order of subject scores over time. They speculate that the long term gain in scores in a 10 item behaviour checklist that lists only negative behaviours is a result of increased scrutiny and observation by the teacher. Presently, in our teachers and staff, we did not witness this pattern of second observation reduction followed by an increase. Statistically, changes were not significant over time, however, the first rating by both teachers and staff at the 2 week mark of treatment was easily the lowest ($T = 63$ and $T = 62$, respectively) average score.

In contrast, the very large symptom decrease seen by parents on the second rating may be solely a function of respite and relief as the ‘problem child’ leaves home. It points to a concern that initial treatment gains, as rated by parents, are illusory and result (at least in part) from the initial extreme referral scores. On the other hand, it may also be argued that the parent ratings are considerably more accurate (and ecologically valid), given that they have the best available baseline from which to gauge symptom improvement. Furthermore, the present study was able to capitalize on the unique treatment design afforded to participants, insofar as parents were given regular opportunities to observe behavioural change throughout the study.

The empirical evidence of a drop from initial CGI ratings [25], is thought by Milich et al. [26] to represent statistical regression to the mean. If this were the case, one would not anticipate ongoing improvement—which stands in stark contrast with the current

findings. They (and others) recommend that any treatment monitoring take at least three measures over time, rather than utilize the limited pre-post design—accordingly, the present study would have benefitted greatly from three preadmission measurements, in addition to the repeated inpatient measurements.

This study provides several important contributions to the residential treatment literature. It replicates the finding that clients demonstrate an overall reduction in parent-observed symptoms during their stay in residential treatment and that the severity of baseline symptoms influences the overall level of that symptom reduction. Further curve fit analyses characterized this reduction as logarithmic, particularly when controlling for baseline severity of symptoms. Finally, despite a rapid deceleration in parent report of child behaviour and mood problems that may represent an initial statistical regression to the mean, and the impact of family separation, significant symptom reduction continued until the expected end-point of treatment. The importance of multi-rater, multi-method assessment in child psychopathology was underscored presently, with parent versus staff and teacher ratings demonstrating different patterns over repeated measurements.

At this point in time, there are few theories within child psychopathology that address trajectories of symptom reduction. While theories addressing stages of treatment change [e.g., 31, 32] have proven useful for describing the trajectory of single well-defined physical health-related problems (e.g., smoking, poor diet), it is not known how well it might help in resolving more serious, complex and/or multiple mental health problems. With certain children and their families, trajectories of change may vary independently of the severity of the child's condition and not necessarily correlate with the duration of help-seeking behavior, the position within the treatment trajectory, or the type of health care service delivery. Further understanding of the differences in therapeutic change is needed to examine residential treatment outcome in an attempt to improve the change trajectory to efficiently and effectively reduce long standing, dysfunctional patterns not only for the children but also for their support network (e.g., parents, siblings). The development of a treatment model to assist in the understanding of treatment responsiveness may provide treating clinicians/practitioners with an enhanced framework within which they may make well-informed decisions about the most promising assessment and treatment options. To date, there is no such theoretical model to draw upon in obtaining a more comprehensive understanding of what impedes or enhances therapeutic responsiveness for children and their families in residential treatment.

Summary

The objective of this study was to investigate the point at which treatment is maximally effective in reducing symptoms related to specific disorders, within a group of children admitted to a tertiary care residential treatment facility. Based on a re-evaluation of the child's progress (using the Connors Global Index, as completed by the child's parent or guardian), the reduction of symptoms was characterized as logarithmic, particularly when controlling for the baseline severity of symptoms. The relevance of these findings is considerable, given the cost and intensity of the treatment provided in tertiary care settings. If, as demonstrated in this study, it is possible to benchmark the point at which a child shows his/her maximum benefit from the treatment being offered, then greater precision can be brought to the discharge planning that accompanies the child's inevitable return to the community. In addition to providing guidance as to the recommended length of treatment, this can help maximize the benefits of the child's residential stay.

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