

Assessing Needs and Outcomes of Children and Youth Receiving Intensive Services

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ABSTRACT

This study investigated whether children/youth in Ontario triaged to residential services showed a higher intensity of need than those referred to outpatient services, and whether residential treatment gains were sufficient for transition to community services. Participants included 2053 children/youth assessed at 23 diverse mental health agencies across Ontario using the interRAI™ Child and Youth Mental Health (ChYMH) instrument. Various presenting problems were examined utilizing scales including: Disruptive/Aggressive Behavior, Hyperactive/Distracton, Social Disengagement, Anxiety, and Sleep Difficulties. Analyses were conducted separately for boys and girls.

Notable differences were found in the initial assessment, with residential boys scoring higher on all scales than outpatient boys, and residential girls scoring higher on the externalizing scales (Disruptive/Aggressive Behavior, Hyperactive/Distracton) than outpatient girls. Treatment gains at residential discharge included improvements in Anxiety, Social Disengagement, Hyperactive/Distracton and Sleep Difficulties for boys and girls to levels at or below the initial scores of outpatient peers. Disruptive/Aggressive Behavior is still a high need following residential services.

The results highlight differences in severity of mental health presentation between children/youth receiving residential and outpatient services, and how multiple agencies in Ontario are providing services that successfully reduce the severity of mental health needs.

KEYWORDS

Mental health; service intensity; outcomes; children; interRAI ChYMH

Introduction

In the design and administration of children's mental health systems, the children and youth experiencing greatest need should be provided with the most resource-intensive interventions and services tailored to their specific needs. Availability and access to mental health services is crucial in that 12.6% of children and youth in Canada struggle with mental health disorders, but

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only 31% of those receive treatment (Duncan et al., 2018). Early intervention is necessary as indicated by Canadian estimates that 70% of adult mental health problems begin during childhood or adolescence (Government of Canada, 2006). To place chronicity of mental health needs in context, in Ontario, an analysis of service pattern usage across a sample of mental health agencies indicated that 23% of children and youth required ongoing services for 2 years and 6% for over 4 years (Reid et al., 2019). These numbers represent ongoing mental health challenges requiring support and signify a proportion of families struggling with periodic crises.

A continuum of care typically offers a system of clinic- or home- and school-based outpatient visits, acute hospital options, and more intensive residential treatment, with varying degrees of integration or discontinuities depending on local resources and coordination. Residential treatment refers to the delivery of inpatient services in which children and youth reside away from their family homes (Den Dunnen et al., 2012; Stewart, Thornley et al., 2020). Residential services are generally considered after less intense outpatient interventions are tried and are intended to stabilize severe behavioral symptoms (James et al., 2010; Lyons, 2004). Placements in residential mental health care for children and youth represent the costliest, and most resource-intensive services available outside of hospital stay and youth justice incarceration (Cuthbert et al., 2011; Stewart et al., 2014). Therefore, ensuring proper application of this type of service for individual children and youth is essential.

Appropriateness of Placement in Residential Treatment

Residential mental/behavioral health treatment placement is one of the options for children/youth faced with out-of-home care, in addition to foster care and corrections/juvenile justice (Frensch & Cameron, 2002; Nofle et al., 2011; Stewart, Thornley et al., 2020). Numerous factors such as the timely availability of a placement option, the severity of a child/youth's presentation, the complexity of the family situation, and risk of harm to self and others may factor variably into placement recommendations as well as length of stay (Stewart et al., 2014). Clinicians across a system may use widely differing standards when determining whether to recommend placement in residential treatment (Bates et al., 1997; Frensch & Cameron, 2002).

Consistent demonstration that mental health systems effectively match children and youth with the highest need for the most intensive supports is infrequent (e.g., Bates et al., 1997; Boel-Studt et al., 2019; Stewart, Celebre et al., 2020; De Swart et al., 2012). When treatment programs fail to document the nature of service delivery and do not describe client needs in a standardized fashion, comparative analyses are not feasible (Green et al., 2007). In past decades, some researchers have found when the entire continuum of care was examined, the population of children and youth in the

most restrictive and intensive care settings was often not dissimilar in many important respects to children and youth receiving care in less restrictive and resource-intensive settings (Bates et al., 1997; Case et al., 2007; Lyons et al., 1998; De Swart et al., 2012). Longitudinally, children and youth with the highest needs and overwhelmed caregivers tend to be the heaviest long-term service users in Ontario's mental health system (Reid et al., 2019). Matching intensity of services with need early can potentially change this trajectory of long-term service use. The present study seeks to understand whether children and youth were triaged to residential care settings appropriately.

Effectiveness of Residential Treatment

In addition to demonstrating appropriate use of costly services, measuring outcomes is essential to the goal of improving child and family functioning. Evaluations of the effectiveness of residential treatment are relatively limited in number and necessarily (due to intensity of need) fail to utilize random assignment to a wait list control group. There are a handful of large-scale reviews indicating residential treatment can be effective in improving functioning for children and youth with serious behavioral and emotional disorders (e.g., Frensch & Cameron, 2002; Hair, 2005; Knorth et al., 2008). Numerous authors have noted the lack of high-quality studies evaluating the effects of residential treatment (e.g., Butler & Richard, 2013; Cuthbert et al., 2011; Frensch & Cameron, 2002; Harder & Knorth, 2015; Walter & Petr, 2007). Limiting factors include lack of a common assessment tool for comprehensive data collection across sites, inconsistent measurement before and after treatment, paucity of treatment descriptions and targeted (evidence based) interventions, and lack of experimental randomized control trials for different types of treatment (Duncan et al., 2018).

Many countries such as Australia, Denmark, New Zealand, Norway, and the United Kingdom have started to mandate coordinated outcome measurement for the child and youth mental health sector as an initiative for funding justification and continuous quality improvement of services (Kwan & Rickwood, 2015). However, in Canada data from child and youth mental health services are not consistently collected and outcomes are not routinely measured across all provinces (Waddell et al., 2005). The recent development of an integrated assessment system that is used extensively in Ontario offers consistent measurement across sectors and the lifespan (see Hirdes et al., 2020). The present study seeks to contribute to the research discourse on efficient matching of service to need while tracking outcomes in intensive child/youth mental health treatments using a tool from this integrated assessment suite.

Present Study

Using a standard assessment tool across mental health agencies, the present study evaluated:

- (1) **Appropriateness of placement in residential treatment:** Do children and youth triaged to residential mental health care in Ontario have the highest needs?
- (2) **Effectiveness of residential treatment:** Are treatment gains from residential mental health services sufficient to enable children and youth to transition appropriately to home care and community services following discharge?

Materials and Method

Participants

The participants were 2053 children and youth ages 7–18 years (61% male; $M_{age} = 12.60$; $SD = 3.20$) receiving mental health services from 23 agencies in Ontario, Canada. Although outpatient data are available for children under age 7, it is extremely rare for younger children to be admitted for residential treatment. Therefore, the minimum age for inclusion in the study was set to age 7 for both inpatient and outpatient samples. The 23 agencies were in the east, west, and central regions of the province, with one agency providing province-wide services to children/youth with complex needs. Specific information about the size, service area, mandates, specializations, and treatment approaches of these agencies in comparison to other mental health agencies in Ontario is not available. These 23 agencies were chosen because all assess clients at both intake and discharge using a common instrument, the interRAI™ Child and Youth Mental Health (ChYMH; Stewart, Hirdes et al., 2017). Initial and discharge assessments were available for 307 children and youth receiving residential services (69% male; $M_{age} = 13.21$; $SD = 2.87$) and 1746 receiving outpatient services (59% male; $M_{age} = 12.49$; $SD = 3.24$). The proportion of children and youth receiving services from the 23 agencies that were excluded due to missing ChYMH assessments at initial, discharge, or both timepoints is unknown (e.g., some agencies had only recently begun implementing discharge assessments at their agency; agencies had different processes for the completion of these assessments). Information on specific therapy/treatments delivered and clients' adherence/engagement or premature discontinuation was not collected. Most children and youth had English reported as their primary language (98%). Racial and socioeconomic diversity data were not collected.

Measures

interRAITM Child and Youth Mental Health (ChYMH). The ChYMH (Stewart, Hirdes et al., 2017) is part of an integrated health information assessment system (see Hirdes et al., 2020) with validated scales and algorithms exhibiting strong reliability and validity (Lau et al., 2021; Stewart & Babcock, 2020; Stewart, Babcock et al., 2020; Stewart & Hamza, 2017). The assessment-to-intervention system can also be utilized for multiple applications including outcome measurement and resource allocation (Stewart, Celebre, Stewart, Celebre, Hirdes et al., 2020).

As part of the standard of care, each of the participants received an initial and discharge ChYMH assessment. Initial assessments are typically done prior to service initiation and discharge assessments take place close to program completion. The average duration of time between initial and discharge assessments was 187.29 days, $SD = 157.04$ (Residential $M = 228.04$; $SD = 164.50$; Outpatient $M = 180.43$, $SD = 154.55$). These do not represent proxy dates for service start and exit, so length of service involvement is not accessible in the archived ChYMH database.

Comprised of approximately 400 items, the ChYMH is completed by trained assessors using all available sources (e.g., the child/youth, caregivers, service providers, clinical records). Assessors are intake workers, care navigators, or clinicians who generally have at least 2 years of experience in the mental health field and have received standard three-day interRAI ChYMH training. Depending on the timepoint of the assessment (i.e., initial or discharge) and the clinical role of the assessor, they may be known or unknown to the client and family prior to the time the information is gathered. Trained assessors used a web-based software system to enter de-identified client data. All items within the instrument required completion prior to submission to prevent missing data. The software system securely stores the data and provides a unique randomly produced study-specific participant number. All personal identifiers were removed before access to the ChYMH data was made available for analysis.

Scales from the ChYMH can provide a summary of current issues to guide clinical decisions, target interventions, and monitor outcomes. Five scales from the ChYMH reflecting intensity of behavioral presentation symptomatic of severity of mental health needs were chosen for the current study: Anxiety (Stewart, Babcock et al., 2020), Social Disengagement (Stewart & Hamza, 2017), Disruptive/Aggressive Behavior (Lau et al., 2018), Hyperactive/Distracton (Lau et al., 2018), and Sleep Difficulties (Stewart & Hamza, 2017). These five scales consist of items with response options able to reflect acute change (e.g., frequency of behavior exhibited in the last 3 days).

Anxiety Scale. The 7-item Anxiety Scale (Stewart, Babcock et al., 2020) measures the frequency of anxiety symptoms (e.g., unrealistic fears, episodes of panic). The scale ranges from 0 to 28. Stewart and Hamza (2017) documented a relation between the Anxiety Scale and Internalizing Behaviors on the Social Skills Improvement System (SSIS) and the Anxious/Depressed Scale on the Child Behavior Checklist (CBCL) with a Cronbach's α of .71. The Anxiety Scale had a Cronbach's α of .77 on the initial ChYMH and .73 on the discharge ChYMH in the present study.

Social Disengagement Scale. The Social Disengagement Scale (previously titled the Anhedonia Scale in Stewart & Hamza, 2017) is a 4-item measure of the frequency of social disengagement (e.g., lack of motivation, withdrawal from activities of interest). The scale ranges from 0 to 16. Previous work has found a relation between this scale and measures of withdrawal and internalizing behaviors with a reported Cronbach's α of .73 (Stewart & Hamza, 2017). In this study, the Cronbach's α was .78 on the initial ChYMH and .79 on the discharge ChYMH for this scale.

Disruptive/Aggressive Behavior Scale. The Disruptive/Aggressive Behavior Scale is comprised of five items and ranges from 0 to 20. The scale is a measure of frequency and diversity of disruptive and aggressive behaviors (e.g., physical abuse, destructive behavior toward property). Lau and colleagues (2018) reported a relation between the Disruptive/Aggressive Behavior Scale and disruptive behavior disorder. Stewart and Hamza (2017) reported an association between this scale and measures of aggressive, bullying, and externalizing behaviors on other previously validated tools with a Cronbach's α of .83. In the current study, the Cronbach's α was .84 on the initial ChYMH and .86 on the discharge ChYMH for the Disruptive/Aggressive Behavior Scale.

Hyperactive/Distracton Scale. The Hyperactive/Distracton Scale measures the frequency of hyperactivity and distractibility (e.g., impulsivity, hyperactivity). The scale contains four items and ranges from 0 to 16. Lau et al. (2018) reported a relation between the Hyperactive/Distracton Scale and attention-deficit hyperactivity disorder (ADHD). The scale has also been found to be associated with the Hyperactivity/Inattention Scale on the SSIS and the Regulating Attention, Impulsivity, and Activity and Externalizing Scales on the Brief Child and Family Phone Interview (BCFPI; Stewart & Hamza, 2017). Stewart and Hamza (2017) reported a Cronbach's α of .78. The Cronbach's α for the Hyperactive/Distracton Scale was .79 on the initial ChYMH and .81 on the discharge ChYMH in the current study.

Sleep Difficulties Scale. The 4-item Sleep Difficulties Scale ranges from 0 to 16 and is a measure of sleep problems common in children and youth (e.g., falls asleep during the day, wakes multiple times at night). Stewart and Hamza (2017) reported a relation between the Sleep Difficulties Scale and Somatic Complaints on the CBCL with a Cronbach's α of .67. The Sleep Difficulties

Scale had a Cronbach's α of .67 on the initial ChYMH and .70 on the discharge ChYMH in the present study.

Analyses

Independent samples t-tests were conducted using IBM SPSS version 24 to investigate differences in raw scale scores between children and youth receiving inpatient versus outpatient services. Although the data within most scales were not normally distributed, the sample size in the current study was sufficiently large to justify the use of parametric statistical tests ($N = 2053$; Fagerland, 2012). Two-tailed analyses were used, providing a conservative approach should findings not be in the expected direction. Cohen's d was used to calculate effect size with a small effect size indicated by $d = 0.2$, a medium effect $d = 0.5$, and a large effect size $d = 0.8$ or higher (as cited in Walker, 2007). Analyses were conducted with raw scores; however, the data illustrated in Figure 1–2 use score percentages for visual consistency across scales since the maximum value for each scale varies.

Results

Although the overall prevalence of mental health problems does not tend to differ between boys and girls, presenting symptoms/conditions do typically vary. Girls tend to display more internalizing symptoms such as anxiety, and boys tend to have more externalizing behaviors such as aggression and hyperactivity (Bartels et al., 2018; Doerfler et al., 2009; Keiley et al., 2003). Preliminary analyses using the initial ChYMH assessments were conducted to establish whether biological sex differences were present in the data set. Independent samples t-tests indicated significant differences in the expected directions between boys and girls for the internalizing scales at initial assessment (Anxiety $M_{boys} = 5.18$, $SD = 4.96$; $M_{girls} = 6.23$, $SD = 5.56$, $t(1581.19) = -4.36$, $p < .001$, two-tailed; Social Disengagement $M_{boys} = 2.64$, $SD = 3.52$; $M_{girls} = 3.13$, $SD = 3.73$, $t(1651.62) = -2.96$, $p < .01$, two-tailed) and externalizing scales at initial assessment (Disruptive/Aggressive Behavior $M_{boys} = 6.12$, $SD = 4.75$; $M_{girls} = 4.15$, $SD = 4.55$, $t(2051) = 9.35$, $p < .001$, two-tailed; Hyperactive/Distracton $M_{boys} = 8.90$, $SD = 4.94$; $M_{girls} = 6.62$, $SD = 4.89$, $t(2051) = 10.24$, $p < .001$, two-tailed). No sex differences were found for Sleep Difficulties ($M_{boys} = 3.50$, $SD = 3.64$, $M_{girls} = 3.71$, $SD = 3.78$; $t(2051) = -1.27$, $p = .21$, two-tailed). The evidence of sex differences in the data set warranted conducting the following analyses for boys and girls separately.

Appropriateness of Placement in Residential Treatment

Can children and youth entering residential services be differentiated from those in outpatient services at intake based on selected scale scores on the ChYMh?

Boys. A series of independent-samples t-tests were conducted to compare the scale scores at initial assessment for boys receiving residential services with boys receiving outpatient services. As shown in Table 1, boys triaged to residential services scored significantly higher at intake than boys triaged to outpatient services on all scales examined. See Figure 1 for illustration of the results. These findings indicate that boys receiving residential and outpatient mental health services differ in levels of need.

Table 1. Comparison of initial raw scale scores for boys and girls entering residential and outpatient services. Boys: residential $n = 213$; outpatient $n = 1032$. Girls: residential $n = 94$; outpatient $n = 714$.

| Scale | Sex | Residential Initial | Outpatient Initial | T-test (two-tailed) | p value | Effect Size (Cohen's d) |
|--------------------------------|-------|------------------------------|-----------------------------|---------------------|------------------|---|
| Anxiety | Boys | $M = 6.13$; $SD = 4.70$ | $M = 4.99$; $SD = 4.99$ | $t(1243) = 3.08$ | $p < .01^{**}$ | $d = .24$; M $dif = 1.14$ 95% CI : .41 to 1.87 |
| | Girls | $M = 6.16$; $SD = 5.34$ | $M = 6.24$; $SD = 5.59$ | $t(806) = -.14$ | $p = .89$ | $d = .02$; M $dif = -.08$ 95% CI : -1.28 to 1.12 |
| Social Disengagement | Boys | $M = 3.53$; $SD = 4.17$ | $M = 2.46$; $SD = 3.34$ | $t(270.70) = 3.51$ | $p = .001^{***}$ | $d = .28$; M $dif = 1.07$ 95% CI : .47 to 1.67 |
| | Girls | $M = 3.29$; $SD = 3.46$ | $M = 3.11$; $SD = 3.76$ | $t(806) = .44$ | $p = .66$ | $d = .05$; M $dif = .18$ 95% CI : -.63 to .98 |
| Disruptive/Aggressive Behavior | Boys | $M = 9.01$; $SD = 4.60$ | $M = 5.53$; $SD = 4.56$ | $t(1243) = 10.15$ | $p < .001^{***}$ | $d = .76$; M $dif = 3.49$ 95% CI : 2.81 to 4.16 |
| | Girls | $M = 7.35$; $SD = 5.25$ | $M = 3.73$; $SD = 4.28$ | $t(109.83) = 6.41$ | $p < .001^{***}$ | $d = .76$; M $dif = 3.62$ 95% CI : 2.50 to 4.74 |
| Hyperactive/Distracton | Boys | $M = 11.19$; $SD = 4.42$ | $M = 8.42$; $SD = 4.92$ | $t(329.48) = 8.16$ | $p < .001^{***}$ | $d = .59$; M $dif = 2.77$ 95% CI : 2.10 to 3.44 |
| | Girls | $M = 9.52$; $SD = 5.29$ | $M = 6.24$; $SD = 4.71$ | $t(113.28) = 5.29$ | $p < .001^{***}$ | $d = .65$; M $dif = 3.29$ 95% CI : 2.15 to 4.42 |
| Sleep Difficulties | Boys | $M = 4.49$; $SD = 4.02$ | $M = 3.30$; $SD = 3.53$ | $t(283.13) = 4.03$ | $p < .001^{***}$ | $d = .32$; M $dif = 1.20$ 95% CI : .61 to 1.78 |
| | Girls | $M = 3.90$; $SD = 3.59$ | $M = 3.69$; $SD = 3.80$ | $t(806) = .53$ | $p = .60$ | $d = .06$; M $dif = .22$ 95% CI : -.60 to 1.03 |

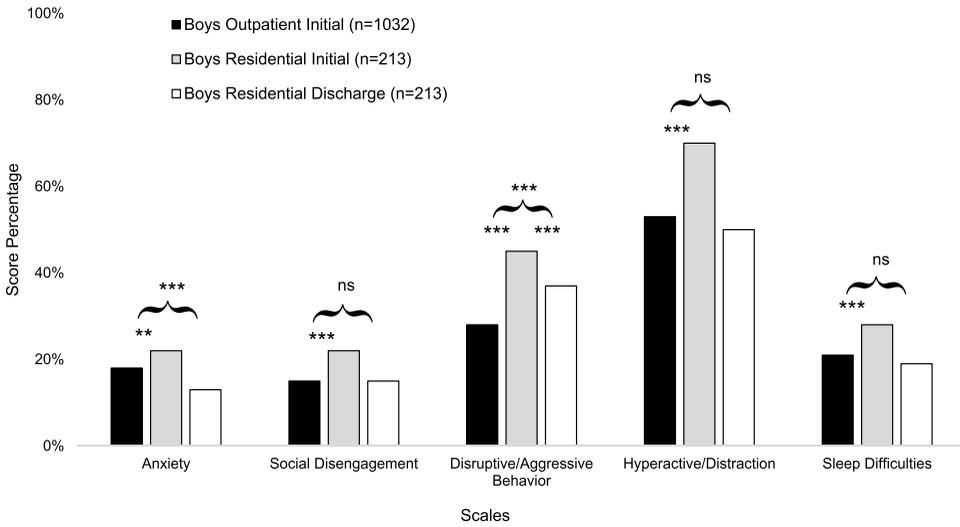


Figure 1. Mean scale scores for outpatient and residential boys. Only comparisons related to the objectives are shown. * $p < .05$; ** $p \leq .01$; *** $p \leq .001$; ns = not significant

Girls. The above analyses were repeated for girls (see Table 1). At initial assessment, girls entering residential services had significantly higher scores than girls entering outpatient services on the externalizing scales: Disruptive/Aggressive Behaviors and Hyperactive/Distracton (see Figure 2), indicating treatment matching need.

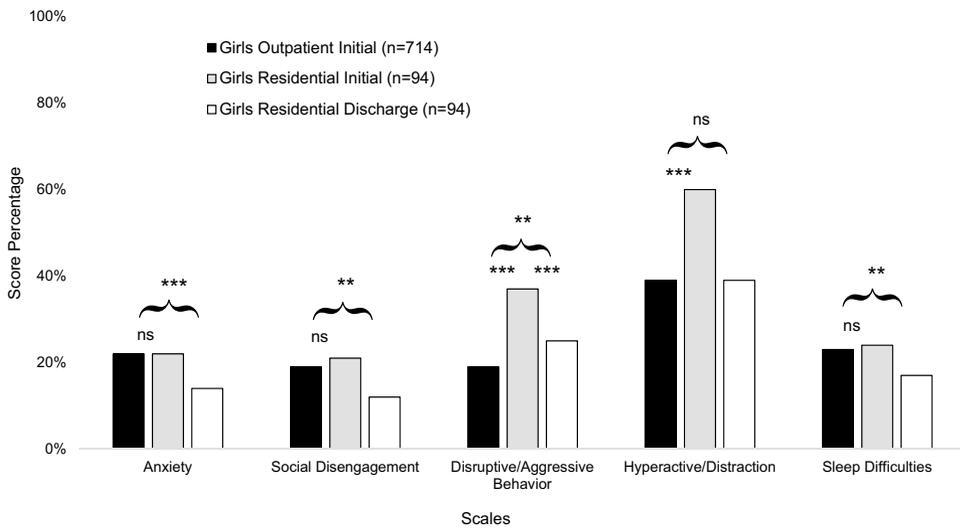


Figure 2. Mean scale scores for outpatient and residential girls. Only comparisons related to the objectives are shown. * $p < .05$; ** $p \leq .01$; *** $p \leq .001$; ns = not significant

Effectiveness of Residential Treatment

Do children and youth discharged from residential services show sufficient improvement in symptom scale scores to warrant transition to less intensive outpatient services? We compared discharge scale scores of children and youth who had received residential services to the initial scores of children and youth entering outpatient services. The analyses were again split by biological sex.

Boys. A series of independent-samples t-tests were conducted to compare the scale scores at discharge for boys who received residential services to initial scale scores for boys entering outpatient services (Table 2). Boys who received residential services demonstrated improvement with Social Disengagement,

Table 2. Comparison of discharge raw scores for boys and girls who received residential services with initial raw scores of boys and girls at intake to outpatient services. Boys: residential $n = 213$; outpatient $n = 1032$. girls: residential $n = 94$; outpatient $n = 714$.

| Scale | Sex | Residential Discharge | Outpatient Initial | T-test (two-tailed) | p value | Effect Size (Cohen's d) |
|---------------------------------|-------|-----------------------------|-----------------------------|---------------------|------------------|--|
| Anxiety | Boys | $M = 3.72$; $SD = 3.86$ | $M = 4.99$; $SD = 4.99$ | $t(374.05) = -4.14$ | $p < .001^{***}$ | $d = .28$; M $dif = -1.27$ $95\% CI: -1.87$ to $-.67$ |
| | Girls | $M = 4.04$; $SD = 3.92$ | $M = 6.24$; $SD = 5.59$ | $t(148.30) = -4.84$ | $p < .001^{***}$ | $d = .46$; M $dif = -2.20$ $95\% CI: -3.10$ to -1.30 |
| Social Disengagement | Boys | $M = 2.32$; $SD = 2.94$ | $M = 2.46$; $SD = 3.34$ | $t(334.44) = -.59$ | $p = .56$ | $d = .04$; M $dif = -.13$ $95\% CI: -.58$ to $.31$ |
| | Girls | $M = 1.88$; $SD = 2.45$ | $M = 3.12$; $SD = 3.76$ | $t(157.72) = -4.23$ | $p < .01^{**}$ | $d = .39$; M $dif = -1.22$ $95\% CI: -1.80$ to $-.65$ |
| Disruptive/ Aggressive Behavior | Boys | $M = 7.36$; $SD = 4.41$ | $M = 5.52$; $SD = 4.56$ | $t(1243) = 5.37$ | $p < .001^{***}$ | $d = .41$; M $dif = 1.83$ $95\% CI: 1.16$ to 2.50 |
| | Girls | $M = 5.03$; $SD = 4.24$ | $M = 3.73$; $SD = 4.28$ | $t(806) = 2.78$ | $p < .01^{**}$ | $d = .30$; M $dif = 1.31$ $95\% CI: .47$ to 2.23 |
| Hyperactive/ Distraction | Boys | $M = 7.98$; $SD = 4.39$ | $M = 8.42$; $SD = 4.92$ | $t(331.45) = -1.32$ | $p = .19$ | $d = .09$; M $dif = -.44$ $95\% CI: -1.11$ to $.22$ |
| | Girls | $M = 6.30$; $SD = 4.13$ | $M = 6.24$; $SD = 4.71$ | $t(806) = .12$ | $p = .90$ | $d = .01$; M $dif = .06$ $95\% CI: -.94$ to 1.06 |
| Sleep Difficulties | Boys | $M = 3.00$; $SD = 3.05$ | $M = 3.30$; $SD = 3.53$ | $t(340.22) = -1.25$ | $p = .21$ | $d = .09$; M $dif = -.30$ $95\% CI: -.76$ to $.17$ |
| | Girls | $M = 2.64$; $SD = 3.16$ | $M = 3.69$; $SD = 3.80$ | $t(131.29) = -2.95$ | $p < .01^{**}$ | $d = .30$; M $dif = -1.05$ $95\% CI: -1.75$ to $-.35$ |

Hyperactive/Distracton, and Sleep Difficulties, scoring equal to boys triaged to outpatient services at initial assessment (see Figure 1). In addition, Anxiety scores at discharge for boys in residential services were significantly lower than the initial scores for boys entering outpatient services. However, discharge scores for the Disruptive/Aggressive Behavior Scale were still higher for inpatient vs outpatient boys. See Figure 1.

Girls. Previous analyses were repeated for girls (Table 2). Similar to the results for boys, girls who received residential services improved at discharge with Hyperactive/Distracton scores that were equal to the initial scores for the outpatient girls. In addition, girls receiving residential services showed significantly better scores at discharge than the outpatient group's initial scale scores for Social Disengagement, Anxiety, and Sleep Difficulties. As was the case for boys, scores for the Disruptive/Aggressive Behavior Scale were still higher for girls who received residential services at discharge compared to girls triaged to outpatient services at initial assessment. Results are shown in Figure 2.

Post Hoc Research Question: Did Residential Mental Health Treatment Have Any Effect on Disruptive/Aggressive Behavior?

As Disruptive/Aggressive Behavior scores for residential boys and girls were still significantly higher at discharge than outpatient initial scores, further analyses were needed to determine if residential treatment had any effect on Disruptive/Aggressive Behavior. Paired sample t-tests were conducted using initial and discharge assessment data for residential boys and girls separately. Scores improved over time for both boys and girls following residential services (Boys $M_{initial} = 9.01$, $SD = 4.60$; $M_{discharge} = 7.36$, $SD = 4.41$; $t(212) = 4.68$, $p < .001$, two-tailed, $d = .32$; $M_{difference} = 1.66$, 95% CI: .96 to 2.36, see Figure 1; Girls $M_{initial} = 7.35$, $SD = 5.25$; $M_{discharge} = 5.03$, $SD = 4.24$; $t(93) = 4.60$, $p < .001$, two-tailed, $d = .48$; $M_{difference} = 2.32$, 95% CI: 1.32 to 3.32, see Figure 2).

Discussion

While examining pre- and post-service changes within individuals is a common method for evaluating outcomes, the present study examines treatment gains within the context of a continuum of care across 23 child and youth mental health centers. Given that a portion of children and youth will be long-term service users needing continued care (Reid et al., 2019), these results suggest that treatment gains following residential services can enable children/youth with high needs to transition to less intensive services in their home community.

Appropriateness of Placement in Residential Treatment

As predicted, children and youth triaged to residential services in the present study differed from those receiving outpatient services on intensity of need. This division of service occurred across a large and diverse sample of clinical decision makers and their clients requesting intensive services. Boys triaged to residential treatment programs were exhibiting more severe internalizing and externalizing types of symptoms/behaviors than those receiving care from outpatient programs. The difference for girls receiving residential versus outpatient services was limited to severity of externalizing behaviors. The non-significant finding that residential and outpatient girls scored similarly on internalizing scales indicate that internalizing symptoms for girls are not unique to inpatient services, but externalizing needs are what drive residential referral. This is consistent with Doerfler et al. (2009) who purport that externalizing behaviors in girls are symptomatic of severe emotional disturbance. Other authors have noted that severity of externalizing behavior exhibited by girls in particular is a key factor in the decision for out-of-home treatment (see review by Handwerk et al., 2006) as well as a pattern identified in youth justice (Stewart, Thornley et al., 2020; Vingilis et al., 2020).

These results suggest the service system does attempt to support children and youth in the least restrictive environment. Because residential stays are costly to the service system and intrusive to the individual, with a risk of exposure to violence from other residents, the decision between residential care or outpatient services should include a valid metric (Cuthbert et al., 2011). Despite the power of actuarial prediction, the goal of identifying behavioral and symptom indicators that effectively direct the need for acute hospitalization, outpatient visits, or out-of-home mental health treatment in children and youth remains elusive (Evans et al., 2020). The present study provides some evidence of proper triaging across diverse agencies to minimize the impact on the child or youth, family and service system. Recently, the interRAI Children's Algorithm for Mental Health and Psychiatric Services (ChAMhPs) was developed to provide an empirically based decision-support tool that can be used to inform the urgency and timing of more urgent or emergent services to support triaging and prioritization (see Stewart et al., 2017). Additionally, the Resource Intensity for Children and Youth (RiChY) tool provides algorithms to determine allocation of resources based on need (Stewart, Celebre et al., 2020). Future research using the interRAI suite will also develop specific decision support mechanisms to determine triaging and prioritization to inpatient pediatric psychiatry.

Effectiveness of Residential Treatment

This study demonstrates how outcomes can be evaluated consistently across child and youth mental health agencies. The ChYMH data in this study found that at discharge from residential treatment mental health symptoms had improved. On most scales, symptoms for residential boys and girls had improved to levels lower than outpatient intake scores as indicated by statistical significance, or to equal values indicated by non-significance (i.e., residential scores were no longer statistically higher). These results help determine if residential services support children and youth to become ready for family care and community-level services. Data regarding the success of child/youth residential mental health services across the province of Ontario has historically been limited. The outcome data presented here provide evidence of areas where services were successful, and how agencies can use the ChYMH to support program evaluation.

The current study finds notable treatment gains were made for residential boys and girls regarding disruptive and aggressive behavior following intensive services. However, boys and girls receiving intensive services have ongoing needs higher than outpatients regarding aggression toward people and property. This is in line with previous research, where several studies examining populations of children and youth receiving residential treatment have identified client profiles that appear particularly resistant to treatment, specifically those characterized by high levels of substance use, conduct disorder, and comorbid attention-deficit/hyperactivity disorder (Cuthbert et al., 2011; Henggeler et al., 2009; Nofle et al., 2011). By identifying areas of continued need at discharge, a transition plan can be created for supports to be put in place to potentially reduce the rates of readmission to residential services for high needs children and youth (Stewart, Theall et al., 2015).

Limitations

Although there are several strengths to this study, such as a large data set across multiple agencies, it is not without limitations. For example, the following three key variables known to influence residential versus outpatient service assignment for children/youth were not examined: previous out-of-home care (including child welfare protection), self-harm, and subjective report of caregiver burden (e.g., Den Dunnen et al., 2012; Stewart et al., 2014). Future research should examine these factors and their relation to differential response to placements. Additionally, demographic variables (e.g., socio-economic status, ethnicity, language/immigration status, parental education level) were not accessible in the current data set. Further research is needed to examine if these may factor variably into placement decisions and treatment outcomes. There may be a range of types of residential care

and levels of clinical supports represented in the current sample. Therefore, it is not known which interventions were implemented prior to or during intensive services, the extent to which evidence-based interventions were implemented or which were more effective than others. It is also possible that youth with certain types of presenting problems were more responsive to certain types of treatment than others. No comparison of symptom complexity differences across agencies was undertaken. No information is available with respect to functional improvement (e.g., school attendance, graduation rates), and whether the treatment gains were maintained over time. Longer term follow-up (e.g., 6–12 months after discharge) with data on community supports received after residential treatment and family reported outcomes is recommended. Given that important service features matched to client needs were not examined, it is not possible to determine which aspects of residential treatment are the most effective in reducing impairment and have lasting benefits. Child and youth residential variables potentially impacting treatment outcomes that should be tracked include: nature of services delivered and treatment fidelity, length of stay or service duration, cost, client and family treatment engagement from both client and clinician perspectives, and peer social engagement in residence (Kennedy et al., 2020). Future research would benefit from examining information on family functioning and placement history in conjunction with data reflecting the severity of mental health concerns such as self-harm, along with consideration of specific treatment approaches.

Conclusion

Given that childhood mental health needs can persist into adulthood, effective intervention services during childhood/adolescence are critical. By using standardized intake and outcome measurement, clinicians can monitor the effectiveness of the services being provided to children and youth, which helps to ensure that they are delivering the best support and care possible for their clients' needs. Agencies building capacity for their clinicians to collect data by using common measurement is an important step in this process (Auditor General of Ontario, 2016; Duncan et al., 2018). The present study indicates that the interRAI ChYMH instrument used across multiple timepoints and diverse agencies in Ontario can help to appropriately triage children and youth with intensive needs for residential services and evaluate outcomes on symptom measures. These data provide evidence that intensive residential mental health services in Ontario are effectively triaging children and youth with high needs, and successfully stabilizing, even reducing, select mental health indicators for children and youth, potentially allowing transition to outpatient services to maintain treatment gains.

Practice Implications

- It is essential to examine whether residential mental health services match and meet the complex needs of children/youth.
- The present study offers a method for determining intensity of need and demonstrating outcomes of residential treatment.
- Using a consistent assessment tool across agencies at initial and discharge time points allows for effective triaging and measurement of treatment outcomes.

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The authors have no conflict of interest to declare.

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