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Reducing Emergency Department Utilization for Pediatric Behavioral Health Crises Through High-Intensity Outpatient Behavioral Intervention

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ABSTRACT

Background: The American Academy of Pediatrics, among other groups, has declared a national emergency in child and adolescent mental health. Relatedly, hospitals have seen an increase in presentations to emergency rooms for behavioral health crises.

Objectives: To evaluate the impact of a high-intensity caregiver behavioral skills program on utilization of emergency department (ED) resources for challenging behaviors, treatment engagement and retention, and relevant clinical variables (e.g. child behavior reduction).

Methods: We conducted a retrospective, nonrandomized cohort study to evaluate outcomes of children referred to an intensive outpatient behavioral treatment clinic from nearby EDs. Outcomes of interest were 1) treatment feasibility and program retention, 2) re-presentation to the ED for challenging behaviors within a 6-month period, and 3) pre/ post changes in clinical variables (i.e. rate of challenging behaviors, caregiver stress).

Results: Participants were grouped according to their treatment status at the time of data analysis. The resulting four groups of participants included those who 1) were referred but did not enroll in outpatient treatment (i.e. nonstarters), 2) completed outpatient treatment, 3) enrolled in outpatient treatment but dropped out, or 4) were screened but were not appropriate for outpatient services. Analyses included the total sample with requisite data and revealed significant decreases in post-intervention ED visits for those who completed treatment (i.e. 31% of participants) and those who dropped out (d 's = 1.70 and .46, respectively). Additionally, caregivers who completed treatment reported significant decreases in functional impairment (d = 2.10) and challenging behaviors (d = .70) one-month post discharge.

Conclusion: Program feasibility was found to be the most significant limitation of the program, though future research should seek to identify factors contributing to non-enrollment. Pre-post treatment outcomes suggest that families completing the program saw significant reductions in childhood challenging behaviors and improvements in family functioning.

From 2007 to 2018, pediatric mental health visits increased by more than 60% at hospital emergency rooms and by over 120% at children's hospitals across the US (Cushing et al., 2023). The most common presenting complaints among caregivers to these acute care services was aggressive or dysregulated behavior (Cushing et al., 2023). However, emergency departments (EDs) are unlikely to be equipped with the resources required to effectively manage and treat patients presenting with these challenging behaviors (Hoffman et al., 2024; Saidinejad et al., 2023). Underscoring this problem, patients engaging in challenging behaviors are among those at highest

risk to board in or re-visit the ED within 6 months (Cushing et al., 2023; Snow et al., 2025). To mitigate the unsustainable burden placed on EDs by the surge in children presenting in behavioral crisis, the American Academy of Pediatrics (AAP) recommends expanding access to step-down programs and specialty care (American Academy of Pediatrics, 2021). Difficulty identifying these services and other appropriate resources in the community may present a barrier to ED staff placing timely referrals (Hoffman et al., 2024). Further complicating this issue, poor diagnostic clarity and third-party payer restrictions may create additional burdens when determining

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how and where to best refer children presenting with challenging behaviors.

Conventional evidence-based behavioral interventions to address challenging behaviors in children are designed and scheduled in outpatient settings, typically occurring once a week (e.g., Triple P; Sanders, 1999, Parent-Child Interaction Therapy [PCIT]; Eyberg et al., 1995, Incredible Years; Webster-Stratton & Reid, 2003; Parent Management Training; Kazdin, 2005). Moderate-to-large effect sizes (typically ranging from 0.50 to 1.20; Comer et al., 2013) have been reported for other behavioral parent training programs designed to reduce disruptive behaviors. Largest effect sizes were noted for problems related to general externalizing symptoms (e.g., disruptive behavior), with more severe behavior difficulties (i.e., aggression, severe rule violations) demonstrating more moderate effects. Current research on these programs suggests that they suffer from significant attrition [up to 69% of families in PCIT (Ufford et al., 2022); 51% of families across all behavioral training programs (Chacko et al., 2016)], reducing their effectiveness in mitigating future utilization of ED services. Preliminary results of research examining the impact of caregiver-mediated behavioral therapy among this population suggest that intensive intervention (i.e., increasing number of treatment hours per week) may reduce the likelihood of re-presentation (Sommerhalder et al., 2021).

Increasing the intensity of intervention delivery leverages principles of reinforcement established by basic behavioral research to address contingencies that impact caregiver behavior (Allen & Warzak, 2000). The purpose of the current study was to evaluate the influence of a high-intensity caregiver behavioral skills program on 1) treatment feasibility and program retention, with the former defined as the percent of referred participants who completed treatment, and the latter defined as the percent of enrolled participants who completed the full treatment course, 2) re-presentation to the ED for challenging behaviors within a 6-month period, and 3) pre/post changes in clinical variables (i.e., rate of challenging behaviors, caregiver stress).

Method

Participants

We conducted a retrospective, nonrandomized cohort study of children who were referred to an outpatient pediatric intensive behavioral treatment clinic from EDs at publicly and privately funded hospitals within a 6-mile radius located in the mid-Atlantic region of the United States (see Figure 1 for participant flow). All families were directed to the clinic via referral by department clinical staff (e.g., social workers, psychiatrists) as part of their discharge planning following their ED visit. ED presentation data were collected retrospectively

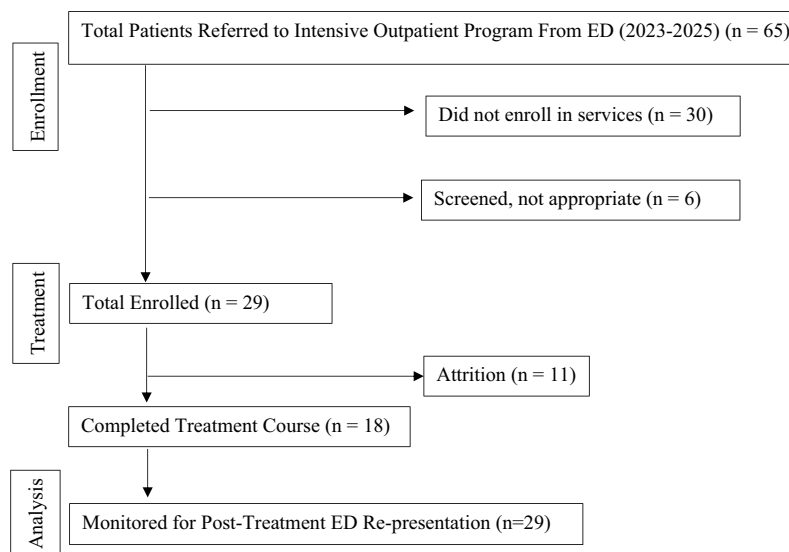


Figure 1. Consort flow diagram.

via participants' electronic health record (i.e., EPIC Care Everywhere). Participants included 65 children aged 3–17 referred following an ED presentation for behavioral health crisis (i.e., aggressive and/or destructive behavior that cannot be safely managed at home) between February 2023 and August 2025. Exclusion criteria included children with a) preexisting or suspected diagnosis of psychosis or thought disorder, b) previous history of suicide intent or attempts, c) previous or current substance use disorder, and d) intellectual disability.

Program structure

The structure of the high-intensity behavioral skills program involved combined child and caregiver skills training over a compressed number of calendar days ($M = 22.4$ days, Median = 20 days, $SD = 11.6$; range, 5 to 25 days). Total clinical time for all participants who completed treatment involved 20 h of intervention delivered across 10 in-person appointments. Thus, the term “high-intensity” in the current study refers to both extended appointment durations (i.e., 2-h instead of the traditional 50-min hour) as well as compressed density (time between appointments) of service delivery. Mean time between appointments was 2.2 days ($SD = 1.4$, range, 0.5 to 4 days). All appointments were 2 h in length and were conducted in person; session content included caregiver consultation (i.e., psychoeducation, homework review, agenda-setting based on feedback from home practice) and direct skills practice with both the caregiver and their child. During periods of psychoeducation and homework review, children were included in the discussion as appropriate; when session content was more relevant for caregivers, children were given time to engage with preferred activities (e.g., coloring, playing with toys). Given the relatively large age range of participants seen in the program, session content was modified to accommodate differences in developmental age. Specifically, for younger children, treatment procedures incorporated the use of visual aids and

structuring of the environment to enhance effectiveness. For pre-adolescent and adolescent participants, use of collaborative problem solving around caregiver expectations and access to preferred activities bolstered the ecological validity.

Treatment for all participants included a habituation paradigm designed to increase their tolerance for distress. Treatment was administered in an individual format with one clinician working with one family, and required at least one caregiver to be present for all appointments. Clinicians consisted of doctoral interns and postdoctoral fellows in clinical psychology, as well as licensed psychologists; all trainees operated under the direct supervision of licensed clinical psychologists. Although study procedures were deemed exempt from Institutional Review Board (IRB) approval because they utilized benign behavioral interventions and routine clinical data collection, informed consent was obtained from all participating families.

Assessment

The process began with a semi-structured functional interview designed to identify the repertoire of problem behaviors, select specific target behaviors, and develop initial functional hypotheses (Edelstein, Moen, et al., 2023). Clinicians then conducted structured observations of child-caregiver interactions to establish operational definitions for these target behaviors, ensuring reliability in continuous data collection and coding. To confirm hypothesized behavioral functions, caregivers were coached to conduct a synthesized contingency analysis (for specific procedures related to the coaching process, see Edelstein et al., 2021). Data from the test conditions of these analyses served as the baseline for subsequent treatment evaluations.

Treatment

The intervention utilized a wait training and denial tolerance protocol based on established delay and denial training literature (Ghaemmaghani et al., 2016; Hanley et al., 2014). All components were delivered to caregivers via in-vivo coaching from clinicians using Behavioral Skills Training (BST), which

included instruction, modeling, rehearsal, and feedback (Miles & Wilder, 2009). The treatment proceeded in three distinct steps: The first step involved functional communication training (FCT). Clinicians coached caregivers to reinforce adaptive communicative behaviors to serve as functional replacements for problem behaviors (Carr & Durand, 1985). Specific responses were individualized to each participant, but typically involved broad classes of requests (e.g., “Excuse me” to appropriately solicit attention, “Break, please” to appropriately request escape from an aversive context). While traditionally considered as a procedure for children who cannot communicate, the current protocol utilized FCT as a means to increase the efficiency of prosocial communication responses that can be used during periods of emotional dysregulation (Ghaemmaghami et al., 2021). Once mastery was achieved (i.e., use of the communication response in the absence of challenging behaviors), only independent requests were honored. That is, caregivers were coached to avoid prompting the children and instead were trained to wait for spontaneous communication instead.

The second step involved a wait training procedure designed to increase tolerance for delays to requests and increase generalizability. Clinicians coached caregivers to introduce systematic delays to thin the schedule of reinforcement from the previous treatment phase. Following an appropriate request, participants were required to wait for a set duration before receiving their requested item or activity (e.g., iPad). Trials began with the delivery of an identified “trigger” to build tolerance for limit-setting. Wait durations were increased following consecutive successful trials, with terminal criteria ranging from 60 s to 3 min, as determined collaboratively with caregivers. The final step, denial tolerance, was introduced where requests were occasionally denied (e.g., “Thank you for asking, but that is unavailable now”). These trials occurred on a variable, unsignaled schedule, alternating with wait trials. This phase taught participants to differentiate between predictable waiting periods and the absolute unavailability of an item, ensuring caregiver follow-through and reducing challenging behaviors during limit-setting.

Measures

Our primary outcomes of interest involved treatment feasibility and program retention. Treatment feasibility was measured as the percentage of referred participants who completed treatment and program retention refers to the percentage of enrolled participants who completed treatment. Our secondary outcome measure involved re-presentation to the ED for behavioral health crisis within a 6-month period following the treatment program. That is, following families’ referral to our program, did their child subsequently experience another behavioral health crisis that caregivers felt they were unable to manage without emergent support from the ED? Finally, our last outcome variable included pre/post treatment changes in clinical variables for those families who completed treatment. These measures include 1) daily tracking of between-appointment child problem behavior (i.e., tantrums, aggression), 2) a caregiver-reported functional impairment scale (Behavior Rating Scale [BRS]; Edelstein, Sullivan, et al., 2023), and 3) standardized measures of both child behavior problems (i.e., Eyberg Child Behavior Inventory [ECBI]; Eyberg & Pincus, 1999) and caregiver variables (i.e., Parenting Stress Index – fourth edition [PSI-4]; Abidin, 2012). The BRS is a single-question tool used before appointments to assess how caregivers perceive their child’s disruptive behavior. Specifically, caregivers were asked to rate the level of functional impairment caused by their child’s disruptive behavior on a scale of 0 (none) to 10 (severe). While the BRS has not been psychometrically evaluated, it is a useful tool to informally track caregivers’ perception of treatment progress. Both the ECBI and the PSI-4 have been found to have acceptable validity and reliability and are widely used to evaluate effectiveness of behavioral parent training programs (ECBI test-retest reliability $\alpha = 0.86$ [intensity subscale], 0.88 [problem subscale]; PSI Chronbach’s $\alpha = 0.90 - 0.91$). Pre-treatment measures were collected during the initial interview, which occurred an average of 10 days (range, 7–14 days) prior to the start of intervention.

Design

The program was evaluated as a non-randomized retrospective cohort study; outcomes were evaluated

for each participant using a single case experimental design (SCED), where experimental control was demonstrated through the successive replication of behavior change in response to shifting performance criteria. All cases enrolled were included, which constituted a controlled consecutive case series (CCCS; Hagopian, 2020). The CCCS requires reporting outcomes for every case, regardless of its outcome, enabling evaluation of how often the procedure produces positive results across a population. This comprehensive reporting allowed for the identification of functional relations that remain consistent across different individuals, providing insight into the prevalence and patterns of clinical problems. CCCS is useful to isolate specific mediating variables that influence treatment success.

Data analysis

To address our first aim, treatment feasibility was calculated by dividing the number of participants who completed treatment by the total sample of participants referred to the program and multiplying by 100. Treatment retention was calculated by dividing the number of participants who enrolled (i.e., completed at least the initial intake appointment) but prematurely dropped out of the program

by the total number of participants enrolled and multiplying by 100. Our second outcome of interest, re-presentation to the ED, was analyzed using dependent samples t-tests to compare pre-post referral visits. Finally, to address our third aim, dependent samples t-tests were used to calculate pre/post changes in clinical variables (i.e., treatment effects for those who completed the program). The reliable change index (RCI; Jacobson & Truax, 1991) was calculated by dividing the difference between pre- and post-treatment scores by the standard error of the difference of standardized measures (i.e., ECBI and PSI-4). Effect sizes were calculated using Cohen's *d*, which examines the number of standard deviations between the group means. Cohen's *d* effect sizes of .20 reflect a small effect, .50 reflect a medium effect, and 0.80 reflect a large effect size. All statistical analyses were conducted using SPSS™.

Results

Participant characteristics and comparison

Participants in the current study were separated into four groups (see Table 1): Group 1 included participants who were referred upon discharge

Table 1. Participant demographic and clinical data.

	Referred, Did Not Enroll (n)	%	Completed Treatment (n)	%	Treatment Dropout (n)	%	Not Appropriate (n)	%
Total	30	55%	18	27%	11	17%	6	9.1%
Age								
Early Childhood (2–5)	0	0%	1	6%	0	0%	0	0
Middle Childhood (6–12)	24	80%	16	88%	9	82%	6	100%
Adolescent (13–18)	6	20%	1	6%	2	18%	0	0
Sex								
Male	19	63%	14	78%	11	100%	6	100%
Female	11	37%	4	22%	0	0%	0	0
Insurance Type								
Medicaid	17	57%	7	39%	9	82%	4	67%
Commercial	13	43%	11	61%	2	18%	2	33%
Psychiatric Diagnosis								
ADHD	7	23%	3	17%	1	9%	1	17%
ASD	0	0%	1	5%	0	0%	0	0%
Conduct Disorder/ODD	1	3.3%	0	0%	1	9%	0	0%
Anxiety Disorder	2	6.7%	2	11%	0	0%	0	0%
Mood Disorder	1	3.3%	0	0%	0	0%	0	0%
2+ MH Diagnoses	18	60%	9	50%	8	73%	4	67%
None	0	0%	3	17%	1	9%	1	17%
Presenting Problem								
Aggression	20	67%	12	67%	6	55%	6	100%
Disruptive Behavior	7	23%	1	5%	2	18%	0	0%
2+ above	3	10%	5	28%	3	27%	0	0%
Medications								
Stimulant	1	3.3%	5	28%	1	9%	1	25%
SSRI	1	3.3%	1	5%	1	9%	0	0%
2+ MH Meds	22	73%	3	17%	3	27%	3	50%
None	6	33%	9	50%	6	55%	2	25%

from ED, but were never scheduled for an appointment (i.e., referred, did not enroll; “non-starter”); Group 2 included participants who were referred, enrolled, and completed treatment (i.e., completed treatment); Group 3 included participants who were referred and enrolled in treatment but dropped out prior to completion (i.e., treatment dropout); and Group 4, which included participants who were referred, but were never enrolled due to information provided by caregivers indicating that they were unable to safely manage their child at home (i.e., not appropriate for outpatient services, and awaiting alternative placement). Across groups, participants were disproportionately male (80% of all participants), had 2 or more psychiatric diagnoses (60% of all participants), had Medicaid insurance (54% of all participants), and took fewer than two psychiatric medications (44% of all participants).

Chi-square tests of independence were conducted to explore between-group differences. Results showed that there were no significant differences in age, insurance type, psychiatric diagnosis, or medication type between participants who completed treatment (group 2) versus those who dropped out (group 3), $X^2_{\text{completed, dropout}}(4, N = 81) = 1.82, p = .61$. In addition, there were no significant differences between participants who were enrolled in treatment (groups 2 and 3) and those who were referred but never seen (group 1) across all four variable comparisons (i.e., age, insurance type, psychiatric diagnosis, medication type), $X^2(206, 207) = 2.44, p = .66$. Finally, to determine whether participants who completed treatment were unique demographically from all other participants, we aggregated available data from all other groups (i.e., those who dropped out, $n = 11$; those who did not enroll in services, $n = 30$; and those who were not appropriate for the program, $n = 6$). A series of Chi-square tests of independence were conducted to assess whether demographic variables were equally distributed across these two groups (i.e., treatment completers versus all other participants). Results indicated that there were no significant relationships between groups and insurance type, number of diagnoses, or number of

medications (see Table 3). However, the groups were significantly different for gender, suggesting that the participants who did not complete treatment were disproportionately male.

Outcome 1 – treatment feasibility and retention

Treatment feasibility [i.e., treatment completers ($n = 18$)/all those referred to treatment ($N = 59$)] was 31%. Treatment retention [i.e., treatment completers ($n = 18$)/all those who started treatment ($n = 29$)] was 62%. Participants that dropped out of the treatment program averaged 5.3 appointments ($SD = 2.39$, Median = 5 appointments; range, 2–8 appointments).

Outcome 2 – likelihood to Re-present at ED

The frequency of ED visits in the 6 months prior to intervention was compared to frequency of ED visits in the 6 months post-intervention (see Table 4). Although lifetime number of ED visits were noted in the table, only ED visits in the 6 months prior to participants’ outpatient admission were used in data analysis. Post-intervention ED visits among participants who completed treatment significantly decreased (95% CI $[-0.56, -0.99]$). Participants who 1) were enrolled but did not complete treatment and 2) were referred but never enrolled (i.e., nonstarters) also had reductions in ED visits 6 months; however, differences for both groups were not statistically significant (p ’s = .46 and .10, respectively). ED visit data for the group of participants who were determined to not be appropriate for the program were not available; it is possible that these individuals were placed in more restrictive living settings whose care was outside the scope of the current study.

Outcome 3 – pre-post treatment effects

Child and caregiver functioning pre- and post-intervention were compared for those who completed treatment (i.e., total sample with requisite data; see Table 5). Post-treatment reductions in functional impairment at discharge and challenging behaviors per day were statistically significant

(95% CI [-6.5857, -3.5254] and 95% CI [-4.1986, -0.9051], respectively). Post-intervention reductions in standardized measures were also statistically significant, with largest effect sizes among ECBI intensity and problem subscales (95% CI [54.7 – 60.1] and 95% CI [50.2–58.6], respectively) and the PSI – Total Stress score (95% CI [62.9 – 75.1]).

To determine whether participants who completed treatment were unique from those who dropped out from the program, we first compared baseline clinical variables between the completed treatment group (group 2) and the treatment drop-out group (i.e., those who enrolled in the program but did not complete it; group 3). Results of independent samples t-tests indicate that the groups were statistically equivalent on all measured clinical dimensions prior to intervention (see Table 2).

Table 2. Results of independent samples T-tests.

Baseline Measure	t(27)	p	95% CI
Baseline Problem Behavior	1.19	.24	[-1.33, 5.09]
Baseline Functional Impairment	0.66	.51	[-1.04, 2.03]
ECBI-Intensity Score	0.14	.88	[-5.24, 6.03]
ECBI-Problem Score	1.10	.29	[-11.62, 3.57]
PSI-PD	0.05	.96	[-12.59, 12.00]
PSI-CDI	0.99	.33	[-21.68, 7.57]
PSI-DC	0.17	.87	[-9.63, 8.16]

Note. Comparison of baseline clinical variables between participants who completed treatment and those who enrolled but dropped out of treatment.

To determine the clinical effectiveness of the treatment program, the reliable change index (RCI; Jacobson & Truax, 1991) was calculated on pre-post ECBI scores for all participants who completed treatment. To change with 95% confidence, the pre-post ECBI-Intensity score must have changed at least 6.72 points, and the ECBI-Problem score must have change at least 8.74 points. As the change in scores was approximately 13 and 12 points, respectively, reliable change occurred for both subscales.

Discussion

The study demonstrates moderate program feasibility and retention, with a 31% feasibility rate (completion among all eligible referrals) and a 62% retention rate (completion among those who actually enrolled). While demographic and clinical profiles, including insurance type, psychiatric diagnoses, and medication use, did not significantly differentiate treatment completers from those who dropped out or failed to enroll, gender emerged as a notable factor, with the non-completing aggregate group being disproportionately male. A critical takeaway for clinical scalability is that while the intervention is highly effective for those who finish, yielding significant reductions in ED visits ($p < .05$), functional impairment, and caregiver stress, its

Table 3. Results of Chi square tests of independence for demographic variables.

Variable	χ^2	df	N	p
Gender	6.49	1	58	.01
Insurance Type	3.3	1	58	.31
Number of Diagnoses	1.04	1	58	.31
Number of Medications	4.4	1	58	.35

Note. Comparisons between treatment completers and all other participants appropriate for treatment.

Table 4. Pre/Post ED Re-presentation.

	Lifetime ED Visits prior to Outpatient Admission, M(SD)	ED visits 6-months prior to Outpatient Admission M(SD)	ED Visits 6-months Post Outpatient Discharge, M(SD)	t	df	p	d
Treatment Completed (n = 18)	1.8(1.6)	1.6(0.9)	0.3(0.6)	9.40	17	<.001	1.7
Treatment Dropout (n = 11)	2.0(1.5)	1.5(0.7)	0.6(1.8)	1.50	10	.16	.46
Referred, Did not Enroll (n = 30)	2.5(3.4)	2.5(1.7)	1.9(1.7)	1.70	29	.10	.31
Evaluated, Not Appropriate (n = 6)	4.3(3.2)	2.7(2.1)					

Note. Post-discharge time frame included 6 months after participants' final appointment. Independent samples t-tests and effect sizes calculated using ED visits 6-month prior to outpatient admission and ED visits post discharge data.

Table 5. Completed participant outcome data.

	Pre <i>M</i> (<i>SD</i>)	Post <i>M</i> (<i>SD</i>)	<i>t</i>	<i>df</i>	<i>p</i>	<i>d</i>	Follow Up <i>M</i> (<i>SD</i>)	<i>t</i>	<i>df</i>	<i>p</i>	<i>d</i>
Problem Behavior per Day	3.8(5.0)	1.3(2.4)	−3.3	17	.005	0.8	0.5(0.6)	−2.9	17	.010	0.7
Functional Impairment Scale (BRS)	8.2(1.7)	3.2(3.0)	−6.9	17	<.001	2.2	3.4(3.3)	−5.1	17	<.001	2.1
ECBI-Intensity	70.7(7.0)	57.4(5.8)	−7.1	17	<.001	1.7					
ECBI-Problem	66.6(10.7)	54.4(9.1)	−3.9	17	.001	0.9					
PSI-PD	65.8(18.7)	52.4(19.3)	−2.2	17	.040	0.5					
PSI-PCDI	76.9(21.5)	62.7(18.8)	−2.1	17	.049	0.7					
PSI-DC	90.7(12.0)	79.4(12.6)	−2.6	17	.018	0.6					
PSI-TS	84.1(15.3)	69.0(13.2)	−3.8	17	.001	0.9					

Note. Total referred reflects the number of participants who were found appropriate for inclusion in the program; Total completed sample refers to sample with requisite data for clinical outcome analysis; Pre-treatment measures were administered *M* = 10 days (range, 7 to 14 days) prior to the start of intervention; Post treatment measures were administered on the day of discharge; Dependent samples *t*-tests were used to compare pre-treatment data to follow up data; Follow-up measures were administered *M* = 32 days post discharge (range, 28 to 44 days).

overall public health impact is currently moderated by high rates of initial non-enrollment. The finding that dropouts averaged over five sessions suggests a window of engagement that could be leveraged to improve retention, yet the lack of baseline clinical differences between groups suggests that “non-starting” is driven by systemic or external barriers rather than patient acuity or demographic complexity.

Results suggest that the rigorous scheduling of high-intensity programs may create a significant obstacle for families in behavioral health crises; notably, 69% of referred participants in this study did not complete the treatment. While these results reflect a conservative measure of the program’s effectiveness, several factors may have unduly inflated these results. Specifically, the study team never interacted with families who did not enroll; as such, these families may not have been given adequate information about the nature of the program (e.g., outcomes for similar families, supports available to minimize barriers, etc.), biasing their willingness to enroll. Alternatively, the program’s retention rates, a metric of program acceptability, are far more encouraging. That is, the rate of attrition for participants who were enrolled in the program was 38%, which reflects a significantly lower rate than what has been reported in the literature (e.g., Chacko et al., 2016; Ufford et al., 2022).

While there were no statistically significant differences between those participants who completed treatment and those who did not, there were several noteworthy characteristics of participants in the current study. Specifically, participants were predominantly male, and most had at least three mental health diagnoses. Families who dropped out or who never enrolled in treatment were more

likely to be covered by Medicaid than those who finished. Additionally, those unable to access treatment (i.e., those who never enrolled or who were determined to be inappropriate for services) were more likely than other participants to be on multiple psychiatric medications.

Several additional considerations regarding barriers to high-intensity behavioral intervention warrant discussion. First, the link between families with Medicaid insurance and treatment dropout suggests that increased logistical or financial stressors may negatively impact treatment engagement for this population. Next, participants on multiple medications and with several mental health diagnoses (perhaps an indicator of clinical complexity) were those who demonstrated the greatest barriers to accessing the treatment program. Additionally, these outcome data may reflect some selection bias, as they may more accurately describe the responsive subset of this broader population rather than the population of families who present to the ED due to behavioral crises at large.

While access remains a challenge, the intervention appears efficacious for the families who do engage in care. These children and families experienced reduced challenging behaviors and improved family functioning following presentation to an ED for a behavioral health crisis, though they may have represented a less stressed, less impaired group overall. The provision of high-intensity services can provide a meaningful step-down option for children and families requiring behavioral skills training as an adjunct to medical intervention. High-intensity intervention models involving fewer calendar days between appointments can result in more rapid acquisition of skills by way of providing more opportunities for both

the child and their caregiver to emit correct (and incorrect) responses and consequently receive more feedback. The rapid and consistent delivery of consequences (i.e., reinforcement and punishment) can have a profound impact on behavior change (e.g., Brady & Emurian, 1978).

In the current study, families who completed the high-intensity intervention were significantly less likely to re-present at EDs in the 6 months following their discharge. Interestingly, both families who never enrolled and those who dropped out early showed a decrease in ED visits 6 months after their initial referral. However, these declines were not statistically significant ($p = .10$ and $.16$, respectively). These decreases suggest that while families might be referred to intensive treatment during a peak period of crisis, these challenges often fluctuate naturally as child-related demands change throughout the year, leading to a “leveling off” even without full participation in the program. Families who completed the high-intensity program saw meaningful decreases in both challenging behaviors and functional impairment (63% and 61% reductions, respectively), as well as reductions in overall stress (18% reduction from baseline).

The study’s limited data collection period (e.g., pre-treatment clinical data collected at the time start of the treatment program, follow up data restricted to only 6-months post discharge) and its retrospective design reflect additional limitations. Future efforts to identify families prospectively and the use of randomization would reduce bias and allow for causal inference. Additionally, since patients were monitored using the electronic health record only, there may have been visits to emergency departments in other states or jurisdictions that were not captured by the software. As such, the current study represents a preliminary effort to characterize this population of children and the impact of targeted behavioral intervention. In the future, collecting baseline data at the time of the acute crisis (e.g., the ED visit) would provide a more temporally proximal and accurate representation of the participant’s functioning level than the current study’s timeline allowed.

The inclusion of families with both state-sponsored and commercial insurance highlights that intensive behavioral programming may be a viable alternative to more traditional outpatient

therapy. As such, an important next step toward addressing the current national emergency in children’s mental health (AAP, 2025) may be to educate providers in the ED on the scope and availability of programs like the one described in the current study. These staff are uniquely positioned to provide caregivers with information about key mechanisms for behavior change and which types of available outpatient programming may be necessary to facilitate long-term improvement. In addition, it would be important to explore whether there is anything that ED providers can do prior to discharge to increase caregiver readiness for a high-intensity behavior change program (e.g., provide psychoeducation, navigate potential barriers, etc.). Of course, another meaningful future direction would be to increase the availability or access to high-intensity programs which specifically target both externalizing behaviors and caregiver training. Since previous research has identified that caregiver-based programs can reduce ED visits and acute psychiatric stays (e.g., Sommerhalder et al., 2021), there is a clear need to launch these programs in under-resourced communities.

Clinical implications

Given the retrospective design of our study, these results are preliminary and should be interpreted with caution. However, community practitioners and outpatient providers may find these data to be optimistic, as many of the procedures available outside of an inpatient setting can be utilized to the benefit of children who have a history of presenting to an ED in behavioral crisis. The program described in the current study was covered by most insurances without preauthorization, including Medicaid; of those families who did enroll, roughly 38% dropped out, reflecting a lower attrition rate than reported in the literature. Despite these favorable retention rates among enrollees, it is important to note that overall results are limited by broader feasibility data, as only 31% of all referred families successfully completed the treatment. As such, there may be fewer than anticipated limitations to constructing similar programs in other high-needs areas. Ultimately,

these preliminary data suggest that the strength of the partnership between emergency departments and outpatient providers will be a key moderator for reducing overutilization in the emergency healthcare system.

Author contributions

CRedit: **Matthew L. Edelstein**: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Supervision, Writing – original draft, Writing – review & editing; **Rochelle N. Picardo**: Data curation, Investigation, Writing – review & editing; **Tegan Hoff**: Data curation, Writing – review & editing; **Mackenzie S. Sommerhalder**: Resources, Validation, Writing – review & editing.

Data availability statement

Data is available upon request from the primary author.

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