A systematic review of the effectiveness of children's behavioral health interventions in psychiatric residential treatment facilities

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A B S T R A C T

Objective: The purpose of this systematic review was to synthesize quantitative or mixed-method studies that evaluate the efficacy of interventions with youth in the context of psychiatric residential treatment facilities (PRTFs) in the United States.
Methods: Systematic review procedures were conducted to identify relevant studies, both published and from the gray literature in the United States. Search terms were informed via consultation with a university social science reference librarian, and four electronic databases were searched. Using a priori inclusion and exclusion criteria, team-based search procedures yielded a final sample of 47 relevant studies.
Results: Studies varied with respect to publication status; sample size; research design; youth gender identity; youth racial/ethnic identity; youth behavioral, psychological, and developmental or intellectual concerns at intake; outcomes measures; and interventions evaluated. Evaluated interventions could be clustered into one of five categories: (a) modifications to system of treatment, (b) therapeutic modalities, (c) educational/alternative programs, (d) practice behaviors, and (e) post-discharge engagement. The majority of studies noted youth outcome improvements; however, some studies also yielded mixed, inconclusive, or null results.
Conclusions: We would characterize the breadth and depth of research in this area to be insufficient in providing PRTF stakeholders a clear and firm understanding of "what works" for youth. Thus, one major implication of our review is the need for more research and efforts to incentivize the evaluation of ongoing practices in youth PRTFs. Still, this systematic review can serve as a convenient reference that can inform tentatively PRTF stakeholders' decisions about the selection of interventions or practice behaviors.

1. Introduction

The effective treatment of youth with significant behavioral concerns in the United States remains an essential issue in the broader national conversation on mental health. The Centers for Disease Control and Prevention (CDC) report that 7.4% of children aged three to seventeen years—approximately 4.5 million—have been diagnosed with a behavioral disorder, and 53.5% of them have received some form of treatment as a result (CDC, 2019). Many youth with behavioral disorders have comorbid conditions as well, with more than one-third experiencing anxiety and about one-fifth experiencing depression (CDC, 2019). Treatment options available for youth diagnosed with behavioral disorders vary in terms of setting, restrictiveness, and methodology. Residential treatment represents the most restrictive option employed for youth who were not successfully rehabilitated in less restrictive, home- or community-based settings, or whose behavioral presentations may be too severe for treatment in less restrictive settings (Lyons, Woltman, Martinovich, & Hancock, 2009).

Residential treatment, in some capacity, has been a long-standing component of mental health services for children, with roots stretching back to the reformatories and orphanages of the 19th century that set the groundwork for residential treatment facilities that began to appear in the early-to-mid 20th century (Lieberman & den Dunnen, 2014). A 2016 report from the Substance Abuse and Mental Health Services Administration (SAMHSA) outlines how integral residential practice remains today. Indeed, there are nearly 700 residential treatment centers (RTCs) for children in the United States, providing 24-hour mental health services for more than 23,000 residential youth. Psychiatric residential treatment facilities (PRTFs) represent an even more restrictive and more expensive level of care amongst residential treatment options, with an average cost of more than $55,000 per resident, per year (Rose & Lanier, 2017; US Department of Health and Human Services, 2013). PRTFs are part of the health care system and are designed to provide therapeutic psychiatric services for children with serious emotional and behavioral disorders. However, evidence suggests much overlap of children involved with child welfare systems who have been removed from their homes due to abuse or neglect and PRTF settings (Lanier & Rose, 2017). So, PRTFs are an out-of-home placement setting, but the primary function is criteria for entry is mental health need. PRTFs are organized around agreements between the Centers for Medicare and Medicaid Services (CMS) and states to provide inpatient psychiatric care under the direction of a physician to Medicaid

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beneficiaries under the age of 21 (Centers for Medicare and Medicaid Services, n.d.). CMS reports that, as of February 2015, there were 384 PRTFs in operation within the CMS (n.d.).

Despite their ongoing use in the treatment of youth with behavioral disorders, concerns persist regarding the long-term effectiveness of residential treatment; the lack of consistent implementation of evidence-based practices (EBPs); the removal of children from family settings; and the general lack of coordination between RTCs, the family, and the community of which the consumer is a part (Harrington, Williams-Washington, Caldwell, Lieberman, & Blau, 2014; Lieberman & den Dunnen, 2014). These criticisms can be even more pointed when examining more restrictive forms of residential treatment, like PRTFs, particularly when research seems to indicate that less restrictive forms of residential treatment yield better outcomes for youth (Lamb, 2009; Ringle, Huefner, James, Pick, & Thompson, 2012; Urdapilleta et al., 2012). It is also possible that outcomes are maximized when children receive the appropriate level of care, which can include residential treatment. For example, a large study of children in residential care in California found that children "properly assessed and placed in the appropriate level of care" had improved placement stability and outcomes (Sunseri, 2005). The benefits of any treatment settings (residential or community-based) must be weighed against the costs. Concerns persist regarding the socioemotional and psychological impact of removing children from their home environments and communities and placing them into restrictive residential settings, with this trauma potentially limiting the effectiveness of any treatment that may be provided (Office of Juvenile Justice and Delinquency Prevention, 2011).

Examining the benefits and shortcomings of residential treatment facilities as settings for intervention delivery can be difficult due to the significant variation in definitions, structure, training, staffing, format, services, and practice throughout the many RTCs and PRTFs that exist in the United States (OJJDP, 2011; Government Accountability Office, 2008). Such heterogeneity means that any two facilities can implement vastly different treatment approaches with differential impacts on youth outcomes, even when the demographic characteristics and presenting problems of their consumers are similar. Consequently, judging the general effectiveness of RTCs and PRTFs is challenging, and efforts are warranted to identify the specific interventions and practice behaviors being implemented in these spaces, particularly those that appear to yield positive outcomes for youth.

Thus, the purpose of this systematic review is to synthesize quantitative or mixed-method studies that have evaluated the efficacy of specific behavioral interventions or practice behaviors with youth in the context of PRTFs in the United States. We exclude pharmacological interventions for two reasons. First, the evidence regarding the benefits and harms of pharmacological interventions for treatment of child and adolescent mental health disorders is relatively robust (e.g., Loy, Merry, Hetrick, & Stasiak, 2017; Storebø et al., 2018). Because PRTFs are inpatient psychiatric settings, a range of effective drugs are available and the use of pharmacological treatments is structured and monitored. Although there is certainly variability in prescribing practices, the implementation of an evidence-based pharmaceutical intervention is likely to be implemented with fidelity to external guidelines and standardized across settings. In contrast, less is known about non-pharmacological therapeutic interventions in general, and specifically when deployed in PRTFs. So, our second reason for focusing on non-pharmacological interventions is that our target audience includes practitioners (such as nurses, psychologists, counselors, and clinical social workers) who are not determining which drugs to prescribe but determine which behavioral treatments to deploy for individuals and patient populations.

We are particularly interested in assessing the extent to which evidence-based practices (EBPs; Family and Youth Services Bureau, 2012; McKibbon, 1998) have been evaluated with youth in PRTFs, although our review is inclusive of all types of interventions and practice behaviors (other than medication-based interventions). Results from this systematic review can map our current understanding of what appears to work well, or not, in the context of PRTF services for youth. Results can also point to key gaps in the literature and inform future research efforts.

2. Methods

2.1. Identifying literature

Our systematic review procedures adhered to best practices as outlined by Cooper (2010) and Littell, Corcoran, and Pillai (2008). We also incorporated A Measurement Tool to Assess Systematic Reviews (AMSTAR) and Preferred Reporting Items for Systematic Reviews and Meta Analyses (PRISMA) guidelines—two tools designed to optimize the conduct and reporting of systematic reviews (Liberati et al., 2009; Moher, Liberati, Tetzlaff, & Altman, 2009; Shea et al., 2007). Our search included the following electronic databases: PsycINFO, Social Work Abstracts, CINAHL, and Web of Science. The final search was conducted in March 2019.

2.2. Search terms

To select our search terms, we consulted a university social science reference librarian with expertise in conducting systematic reviews. Our final string of search terms was (psychiat* OR mental) AND ("residential care" OR "residential treatment") AND (youth OR adolescents OR young people OR teen* OR young adults OR child*) AND (intervention OR treatment OR therapy OR program). Note that an asterisk indicates the search string captures words with alternative endings or forms.

2.3. Inclusion and exclusion criteria

Studies were considered eligible for review if they met the following a priori *inclusion* criteria: (a) the study was empirical (i.e., data were collected and analyzed), (b) quantitative data were collected or a mixed methods approach was used, (c) the study took place in the United States, (d) the study focused on a sample of youth (i.e., 21 years old or younger) in a residential treatment setting, and (e) the study focused on evaluating the effectiveness of an intervention intended to promote positive youth outcomes. Our search was inclusive of both published studies and studies in the gray literature (e.g., theses, dissertations, book chapters; Littell et al., 2008). Efforts to include studies in the gray literature is a recommended method to minimize the risk of publication bias (i.e., studies with null findings having a lower probability of being accepted in peer-reviewed journals; Littell et al., 2008). Importantly, we deemed it insufficient for a study to simply assess whether "residential treatment works." That is, studies were not considered relevant if they simply described outcome changes in youth in residential treatment without linking outcome changes to a specific intervention or practice behavior. This decision was intended to optimize the practical utility of the systematic review by highlighting only findings that were linked to clearly defined and malleable intervention strategies.

In our search, we also employed a related set of *exclusion* criteria, including the following: (a) the study focused on adult patients, (b) the study focused on parents and parent-child dyads, (c) the source presented and described an intervention or practice behavior without any formal evaluation of its effectiveness, (d) the study broadly compared treatment settings (e.g., residential treatment versus outpatient treatment), (e) the study focused on evaluating the impact of a training on staff outcomes, (f) case studies, (g) the study only used qualitative data, (h) the study focused exclusively on substance use treatment, (i) the study focused exclusively on eating disorder treatment, and (j) the study focused exclusively on medication-based interventions.

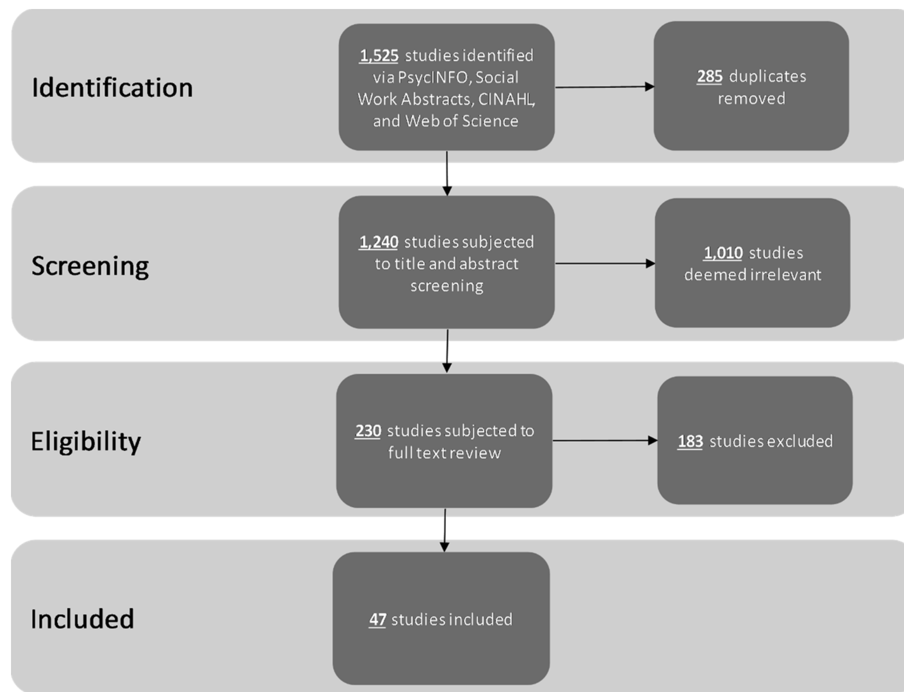

Fig. 1. Systematic review study identification, screening, and selection.

2.4. Study identification, screening, and selection

Fig. 1 displays a PRISMA diagram, summarizing the results of each stage of the systematic review process. We used the online platform Covidence to organize our team's process of identifying, screening, and selecting studies for final inclusion. A total of 1,525 studies were imported into Covidence for initial screening, 285 of which were flagged as duplicates and removed. The remaining 1,240 studies were subjected to title and abstract screening, whereby screeners assessed the alignment between the study title or abstract and the pre-specified inclusion criteria. Each study was screened independently by two members of the research team, allowing for an assessment of congruous or incongruous screening outcomes. Incongruous screening outcomes (e.g., one screener voted to include a study and the other screener voted to exclude the study or indicated being uncertain) resulted in the study being moved into the next stage of the systematic review process—full text review.

Two-hundred and thirty studies proceeded to the full text review stage, and the remaining 1010 studies were excluded from further consideration. At this stage, a set of primary reviewers on the research team reviewed their own individual set of studies, whereas a secondary reviewer reviewed all 230 studies. This strategy was intended to provide some consistency in the full text review process by having a secondary reviewer assess the suitability of all studies, while maintaining the advantages of having another independent reviewer to allow for an assessment of congruous or incongruous review outcomes. Incongruous review outcomes at this stage were resolved via discussion and consensus among research team members. Ultimately, 47 studies were identified as relevant for the systematic review, and the remaining 183 studies were excluded from further consideration.

2.5. Data extraction

Members of the research team extracted relevant data from each included study, including information about study type (i.e., published study versus study in the gray literature), general study setting or location, sample size, sample description (i.e., age, gender identity, racial/ethnic identity, presence/prevalence of externalizing problems, presence/prevalence of internalizing problems, presence/prevalence of intellectual and developmental disabilities), the program model or practice behavior being evaluated, research design, and outcomes measured. Table 1 provides a brief summary of each included study with respect to these data points. This table also incorporates reporting standards for group care programs as suggested by Lee and Barth (2011). At this point we should note that the substantial heterogeneity across studies with respect to interventions and youth outcomes made meta-analyses infeasible.

3. Results

3.1. Study characteristics

Fourteen (30%) of the 47 included studies were dissertations; the remaining 33 studies were published in peer-reviewed journals. Sample sizes varied substantially across studies, ranging from five to 554 (M = 105, SD = 115; median = 68). Rather than sample size, two studies reported an event-level count of youth entering the treatment facility (Robst, 2013, 2014). Two studies did not report sample size (Haynes, 2018; Izzo, 2016). See Table 1 for additional details, including information about study setting and participant age.

Studies also varied with respect to the gender identity of youth. Eight (17%) studies used all-male samples of youth, 23 (49%) studies used majority-male samples of youth, seven (15%) studies used majority-female samples of youth, and five (11%) studies used all-female samples of youth. Four (8%) studies did not report information about youth gender identity. An even larger number of studies did not report information about youth racial/ethnic identity—11 (23%). Among studies that did, youth identifying as White were the most represented overall, followed by youth identifying as Black or African American, youth identifying as Hispanic, youth identifying as biracial or multiracial, youth identifying as Native American, youth identifying as an "other" race, and youth identifying as Asian or Asian American. Across studies, proportions of youth identifying as White varied widely, ranging from 10% to 91%. Twenty (43%) studies used samples comprised mostly of White-identifying youth, three (6%) studies used samples comprised by equal parts White-identifying youth and racial/ethnic

Table 1
Description of 47 studies included in the systematic review.

First author	Year	Study type	Setting & Location*	N	Participant age	Participant gender identity	Participant racial/ethnic identity	Presence of externalizing problems
Anderson	2013	Dissertation	Residential group care facility in the Midwest	157	Range: 9–18	22% female	Not reported	Yes - Unspecified
Andrassy	2016	Journal article	A 140-bed children and adolescent residential treatment hospital	140	Not reported	Not reported	Not reported	No/Not reported
Apsche	2005	Journal article	Not reported	40	Range: 11–18; treatment group (n = 21): M = 16.5; control group (n = 19): M = 16.1	0% female	Treatment group: 81% African American, 14% European American, and 5% Hispanic American; control group: 79% African American, 16% European American, and 5% Hispanic American	Yes - Partial
Armour	2005	Journal article	Two residential treatment facilities in Texas	46	Range: 9–18; M = 15	61% female	30% African American, 43% White, 12% Hispanic, 15% mixed race or unknown	Yes - Full
Bettmann	2007	Journal article	Not Reported	93	Range: 14–17; M = 16.0, SD = 0.9	40% female	90% White, 3% Hispanic/Latino, 2% Native American, 1% Asian, 3% Biracial	Yes - Unspecified
Boel-Studt	2017	Journal article	Psychiatric residential facilities of a large Midwestern behavioral health agency	205	Range: 5–17; M = 10.5, SD = 2.7	42% female	69% White, 14% multiracial, 11% Black	Yes - Unspecified
Boel-Studt	2015	Dissertation	Psychiatric residential facilities of a large Midwestern behavioral health agency	447	Range: 5–17; M = 10.6, SD = 2.6	40% female	12% Black, 72% white, 9% multiracial, 3% Hispanic	Yes - Partial
Bougard	2016	Journal article	Acute care facility that offers both acute and residential levels of care	11	Range: 13–17	100% female	Not reported	Yes - Unspecified
Brady	2004	Dissertation	Private, non-profit social service agency with campuses in two communities within a rural Midwest state	164	Range: 4–13; M = 9.5, SD = 2.2	29% female	46% Caucasian, 45% Native American, 7% Biracial, 2% Black	Yes - Full
Cloyd	2008	Dissertation	State operated residential treatment program	47	M = 15.5	49% female	Treatment group: 56% African American, 39% White, 6% Latino; comparison group: 41% African American, 48% White, 7% Latino	Yes - Unspecified
Coleman	1992	Journal article	Residential treatment center for children and adolescents	39	Range: 13–18; M = 15.9, SD = 10.2	26% female	67% White, 25% Black, 8% Hispanic	Yes - Partial
Conner	2005	Journal article	Juvenile institution	163	Range: 12–19; M = 16.0	0% female	42% White, 39% Black, 12% Hispanic, 4% Biracial, and 3% Other	Yes - Partial
Corbett	2005	Dissertation	San Diego	8	Range: 7–12; M = 9.9, SD = 2.0 years	63% female	50% White, 38% Black, 13% Biracial	No/Not Reported
D'Andrea	2013	Journal article	Sports league for girls in residential treatment facilities across several suburban and metropolitan regions of a mid-sized state	88	Range: 12–21	100% female	30% White, 39% Black, 26% Hispanic, 4% mixed ethnicity or Other	Yes - Partial
Dority	2017	Dissertation	Residential treatment centers in a Minnesota county	66	Not reported	56% female	Not reported	No/Not reported
English	2005	Dissertation	Residential treatment center in a Northeastern state	165	Range: 5–12; M = 9.0	31% female	70% European American, 13% African American, 8% Hispanic American, 7% Biracial, 2% Other	Yes - Partial
Farmer	2017	Journal article	Group and teaching family model (TFM) homes in a Southeastern state	554	M = 14.7, SD = 2.0	84% female	46% racial/ethnic minority, 54% European American	Yes - Partial
Felver	2017	Journal article	Intensive residential psychiatric treatment facility in Pacific Northwest metro center	10	Range: 7–12; M = 10.0	40% female	50% European American, 10% Hispanic American, 10% Asian American, 3% more than one ethnicity	Yes - Partial

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Table 1 (*continued*)

First author	Year	Study type	Setting & Location*	*N*	Participant age	Participant gender identity	Participant racial/ethnic identity	Presence of externalizing problems
Foster	1999	Journal article	3 Military Bases (Fort Bragg, Fort Campbell, Fort Stewart)	204	Treatment group (n = 112): M = 12.8, SD = 2.9; comparison group (n = 92): M = 12.9, SD = 3.0	37% female	Treatment group: 77% European American; Comparison group: 65% European American	Yes - Partial
Gamboa	1974	Journal article	Kentucky Region III Re-Education Center population	116	Range: 6–12	Not reported	Not reported	No/Not reported
Gilbert-Eliot	2014	Dissertation	Not reported	5	Range: 13–17	60% female	Not reported	Yes - Unspecified
Greyber	2015	Journal article	Hillside Family Agencies, residential treatment centers in rural region of New York	7	Range: 14–18; M = 16.4	100% Female	71% White, 14% Black/African-American, 14% Biracial	Yes - Partial
Haynes	2018	Dissertation	Florida	Not reported	Not reported	Not reported	Not reported	Yes - Unspecified
Huefner	2015	Journal article	One large facility in the Midwest and nine small facilities across the United States	350	M = 15.7	37% female	34% Caucasian, 66% Not Caucasian	Yes - Partial
Hurley	2017	Journal article	Therapeutic residential care facility in a large Midwestern city	112	Range: 10–17; M = 15.3, SD = 1.3	43% female	11% Hispanic or Latino, 23% African American or Black, 2% Native American, 1% Asian, 39% White, 24% mixed ethnicity	Yes - Full
Isava	2007	Dissertation	Residential treatment center in Kansas	36	Range: 12–17	0% female	83% White, 3% Black, 6% Hispanic, 8% Other	Yes - Unspecified
Izzo	2016	Journal article	Eleven agencies	Not reported	Not reported	Not reported	Not reported	No/Not Reported
Lakin	2004	Journal article	University of New Mexico's Children's Psychiatric Center (CPC) in Albuquerque, New Mexico	89	Range: 5–17, M = 11.7	34% female	51% White, 27% Hispanic, 11% Native American, 3% African American, 7% Multi-Racial, 1% Filipino	Yes - Partial
Lieberman	1997	Journal article	Northwest United States	16	Range: 12–17, M = 14.9	0% female	Not reported	No/Not Reported
Marvin	2017	Journal article	Residential Treatment Center in Utah	54	M = 14.85, SD = 1.78	100% female	58% White, 19% Native American/Alaskan Native, 13% African American, 6% Hispanic, 4% Unknown	Yes - Partial
McCabe	2010	Dissertation	Residential treatment center in the Southeast	55	Range: 14–18	0% female	53% African American, 23% White, 11% Hispanic, 11% Afro-Caribbean, 2% Mixed race	Yes - Partial
McDonell	2010	Journal article	Long-term psychiatric hospital	210	Range: 12–17; treatment group: M = 15.5, SD = 1.2; control group: M = 15.3, SD = 1.1	58% female	Not reported	Yes - Partial
Newman	2018	Journal article	Residential treatment center in the Southeast	83	M = 25.7, SD = 1.5	0% female	58% White, 37% Black, 5% Hispanic	No/Not Reported
Oxer	2001	Journal article	Four residential treatment facilities	25	Range: 10–18; M = 14.2, SD = 2.4	32% female	Not reported	Yes - Partial
Pierpont	2004	Journal article	Eastern area residential treatment home (EARTH)	10	Range: 6–10.4; M = 7.8	20% female	50% African American, 50% White	Yes - Partial
Raider	2008	Journal article	Residential facility in Ohio	20	Range: 15–18; M = 16.6	45% female	10% Black, 85% White, 5% Hispanic	Yes - Partial
Rivard	2003	Journal article	Residential treatment facility in the Northeast	111	Range: 12–20; M = 15.4, SD = 1.7	27% female	33% Hispanic, 50% Black, 11% White, 1% Asian/Pacific Islander, 1% Biracial, 1% Other	Yes - Partial
Robst	2014	Journal article	Residential treatment facility in Florida	1649 episodes	M = 13.5, SD = 2.6	43% female	61% White, 25% Black, 9% Hispanic, 6% Other	Yes - Partial
Robst	2013	Journal article	Residential treatment facility in Florida	1505 episodes	M = 13.3, SD = 2.5	41% female	58% White, 9% Hispanic, 26% Black, 6% Other	Yes - Partial

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Table 1 (*continued*)

First author	Year	Study type	Setting & Location*	N	Participant age	Participant gender identity	Participant racial/ethnic identity	Presence of externalizing problems
Rooney	2002	Dissertation	Residential treatment facility	10	Range: 14–18; $M = 15.6$, $SD = 1.2$	0% female	50% African American; 40% Hispanic; 10% Caucasian	Yes - Unspecified
Schneider	2018	Journal article	Residential treatment facility	70	$M = 15.4$, $SD = 1.1$	61% female	91% White; 1% Hispanic; 1% Asian; 7% Not reported	No/Not reported
Smith-Toles	2004	Dissertation	Three residential treatment facilities in Tennessee, Mississippi, and Arkansas	155	Pre-MST approach: Range: 7–18, $M = 12.7$; Post-MST approach: Range 7–17; $M = 13.7$	Pre-MST approach: 26% female; Post-MST approach: 20% female	Pre-MST approach: 39% Black; 58% Caucasian; 3% Others; Post-MST approach: 38% Black; 59% Caucasian; 3% Others	Yes - Unspecified
Stage	1999	Journal article	Residential treatment facility in a large Southeastern city	130	$M = 14.7$, $SD = 1.6$	34% female	58% African Americans, 41% European Americans	Yes - Unspecified
Storms	2002	Dissertation	Residential treatment facility in Virginia	57	Range: 13–20; $M = 16.4$	0% female	51% Black, 35% Caucasian, 14% Hispanic	Yes - Full
Sunseri	2004	Journal article	A residential treatment program in California	68	Range: 12–18; Pre-treatment period $M = 14.0$, $SD = 1.8$; Post treatment period: $M = 15.2$, $SD = 1.3$;	100% female	Pre-treatment: 76% Caucasian; Post-treatment: 88% Caucasian	Yes - Partial
Wisdom	2015	Journal article	New York State Office of Mental Health	64	Not reported	26–47% female	55–82% non-Hispanic White, 7–30% non-Hispanic Black, 5–19% Hispanic; 6–15% Other and multiple race	Yes - Partial
Yanchak	2009	Dissertation	Two residential treatment centers in the Southeast	23	$M = 15.3$	35% female	57% Caucasian, 44% African American	Yes - Unspecified

First author	Presence of internalizing problems	Presence of intellectual and developmental disabilities	Comparison group	Type of comparison	Random assignment	Youth outcome(s)*	Outcome(s) measured at multiple time points	Program model (PM) and Practice Elements (PE) (if information is available*
Anderson	Yes - Unspecified	Yes - Partial	No	NA	NA	Successful discharge, defined as youth transitioning to home with family, foster care, or independent living	No	No PM stated. PE described include family involvement in treatment, defined as monthly contact with family 50% or more of the time
Andrassy	No/Not reported	No/Not reported	No	NA	NA	Facility-level rates of youth restraints and seclusions	Yes	Public health prevention model; Feelings Thermometer scale for youth to self-assess their current feelings; youth point to a face on the scale to rate their feelings, with levels including "(1) cool, (2) warm, (3) hot, (4) simmering, (5) steaming, (6) boiling over, and (7) on fire!"
Apsche	Yes - Partial	No/Not Reported	Yes	Treatment as usual (i.e., standard Cognitive Behavioral Therapy)	Yes	Physical and sexual aggression, measured by daily behavior reports and behavior incident reports; Child Behavior Checklist; and the Devereaux Scales of Mental Disorders	Yes	Mode Deactivation Therapy, an advanced form of Cognitive Behavioral Therapy based on Beck's theory of modes, and standard Cognitive Behavioral Therapy for adolescent males in residential treatment. Psycho-educational treatment curriculum
Armour	Yes - Partial	Yes - Partial	No	NA	NA	Level-of-care status, level-of-care domains, and Children's Global Assessment of Functioning	Yes	Exceptional Care Program, a program intended to benefit youth with the most severe behavioral difficulties using a no-eject, no-reject policy. Routine child care, educational, recreational, and vocational services, & behavioral management.

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Table 1 (*continued*)

First author	Presence of internalizing problems	Presence of intellectual and developmental disabilities	Comparison group	Type of comparison	Random assignment	Youth outcome(s)*	Outcome(s) measured at multiple time points	Program model (PM) and Practice Elements (PE) (if information is available*
Bettmann	Yes - Unspecified	No/Not Reported	No	NA	NA	AAQ; Inventory of Parent and Peer Attachment	Yes	Wilderness treatment (7 week residential); PE not described.
Boel-Studt	Yes - Unspecified	No/Not Reported	Yes	Treatment as usual (i.e., traditional psychiatric residential treatment)	No	CAFAS; behavior management incidents; length of stay; discharge placement	Yes	Trauma-Informed Psychiatric Residential Treatment (TI-PRT), which included trauma-focused individual therapy (EMDR or Trauma-Focused Cognitive Behavioral Therapy) and a trauma recovery group-based curriculum
Boel-Studt	Yes - Partial	Yes - Partial	No	NA	NA	CAFAS; discharge level	Yes	PM not stated. Treatment mediators were examined: family involvement, restraint/seclusion incidents, and length of stay in treatment; individual therapy; family therapy, counseling, medical & psychiatric services
Bougard	Yes - Unspecified	No/Not Reported	No	NA	NA	Child Posttraumatic Stress Disorder Symptom Scale; adverse events	Yes	Turning the Tides trauma-focused curriculum consists of 12 group therapy sessions provided twice a week over a 6-week period, with each session ranging from 60 to 90 min in length
Brady	Yes - Full	Yes - Partial	No	NA	No	Positive or negative outcome in three areas post-discharge (behavioral, academic, and delinquent activities)	Yes	Milieu therapy as a central component of treatment for the children in residence with post-discharge engagement; psychiatric care; individual, family, and group therapy
Cloyd	No/Not Reported	No/Not Reported	Yes	Treatment as usual (i.e., traditional psychiatric residential treatment)	No	The number of critical incident reports for each participant for the first 30 days after admission to the program and for the 30 days prior to discharge from the treatment program	Yes	Stop and Go program based on social cognitive information processing model. Individual therapy.
Coleman	Yes - Partial	Yes - Partial	Yes	Treatment as usual	Yes	Social skills knowledge; moral reasoning; self-control; observable behavior	Yes	Aggression replacement training program (10-week); Groupwork and homework.
Conner	Yes - Partial	No/Not Reported	Yes	Four levels of service intensity	No	Emotional and behavioral problems	Yes	PM not stated. Mental health services.
Corbett	Yes - Full	No/Not Reported	Yes	Case record review	No	Length of stay; discharge disposition	No	PM not stated. Family therapy with individual therapy.
D'Andrea	Yes - Partial	No/Not Reported	Yes	Treatment as usual	no	Physical restraints; need for use of time-outs in programs; CBCL	Yes	Do the Good (DtG), a sports-based intervention that was designed for this population using trauma-informed treatment principles; Sport games.
Dority	No/Not reported	No/Not reported	Yes	Treatment as usual (i.e., traditional long-term residential treatment)	No	Number of days in out-of-home placement	Yes	Collaborative intensive bridging services (CIBS) treatment model: blended intensive family therapy (including participation in family therapy) and brief (30–45 day) residential treatment
English	Yes - Partial	Yes - Partial	No	NA	NA	Length of stay (measured in semesters) in residential program	Yes	PM not stated. Use of physical restraint
Farmer	Yes - Partial	No/Not reported	Yes	Treatment as usual (i.e., Non-TFM group homes)	No	SDQ Total Problems Score	Yes	Teaching Family Model, a form of group home setting with family-style living, specialized training and support of staff, and proactive behavioral approaches

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Table 1 (*continued*)

First author	Presence of internalizing problems	Presence of intellectual and developmental disabilities	Comparison group	Type of comparison	Random assignment	Youth outcome(s)*	Outcome(s) measured at multiple time points	Program model (PM) and Practice Elements (PE) (if information is available*
Felver	Yes - Partial	Yes - Partial	No	NA	NA	Occurrences of seclusion and restraint on treatment and non-treatment days	Yes	Mindful Life: Schools, a manualized contemplative intervention designed to teach youth self-regulatory and relaxation skills through secularized yoga and mindfulness practices; teaches children basic mindfulness and yoga skills in a developmentally tailored format for youth, incorporating games, activities, and structured lessons
Foster	Yes - Partial	No/Not reported	Yes	No treatment (i.e., aftercare not provided, though families could arrange services on their own)	No	Hazard of/time to readmission	Yes	PM not stated. After-care 60 days post-discharge from inpatient facilities
Gamboa	Yes – Full	No/Not reported	No	NA	NA	Self-adjustment; school adjustment; family adjustment	Yes	Project Re-Ed, an ecological short-term residential treatment for youth with emotional disturbance
Gilbert-Eliot	Yes - Unspecified	No/Not reported	No	NA	NA	WAI-S; Ohio Youth Problems, Functioning, and Satisfaction Scales	Yes	PM not stated. Promoting therapeutic alliance
Greyber	Yes - Partial	No/Not reported	No	NA	NA	Body Mass Index, weight loss/gain in pounds, and pre-post triglyceride values	Yes	PM not stated. Health and wellness group intervention including diet, exercise/ physical activity, and medication psychoeducation; included a meal/snack protocol, physical activity protocol, family involvement, and psychoeducation
Haynes	Yes - Full	No/Not reported	No	NA	NA	Youth behavior; internal and external incident reports	Yes	Positive Behavior Interventions and Supports (PBIS), a model focused on the implementation of supports and treatment in natural contexts using an ecological perspective
Huefner	Yes - Partial	No/Not reported	No	NA	NA	Disruptive behavior; departure and follow-up success	Yes	PM not stated. Family involvement
Hurley	No/Not reported	No/Not reported	No	NA	NA	CBCL, Therapeutic Alliance Quality Scale	Yes	PM not stated. Promoting therapeutic alliance and positive staff-youth interactions
Isava	Yes - Unspecified	No/Not reported	Yes	Treatment as usual (i.e., originally prescribed treatment plans)	Yes	Content knowledge; social emotional skills and affect; maladaptive emotions, cognitions, and behaviors; iatrogenic effects; CDI; YSR SSBS; HCSBS	Yes	Strong Teens, a brief and practical social and emotional learning program that teaches youth about positive social, emotional, and behavioral skills in fostering emotional resilience and coping skills. 12 lessons of group and individual therapy.
Izzo	No/Not Reported	No/Not Reported	No	NA	NA	Behavioral incidents	Yes	Children and Residential Experiences (CARE), a principle-based program designed to enhance the social dynamics in group care settings through targeted staff development and ongoing reflective practice (i.e., learning through focused attention to one's own practice); explicitly uses an ecological approach to help agencies transition from simply maintaining compliance to creating a living environment that provides developmentally enriching experiences and a "sense of normality" for youth

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Table 1 (*continued*)

First author	Presence of internalizing problems	Presence of intellectual and developmental disabilities	Comparison group	Type of comparison	Random assignment	Youth outcome(s)*	Outcome(s) measured at multiple time points	Program model (PM) and Practice Elements (PE) (if information is available*
Lakin	Yes - Partial	Yes - Partial	No	NA	NA	CFARS; CAFAS; severity of behavior; length of stay; number of re-hospitalizations	Yes	PM not stated. group therapy, family therapy, individual therapy, psychopharmacology services
Lieberman	No/Not Reported	No/Not Reported	No	NA	NA	Daily Performance Rating	Yes	PM not stated. Vocational training program, which incorporated training methodologies including work simulation, classroom instruction, group therapy, individual counseling, and a structured behavior-modification system with monetary reinforcement
Marvin	Yes - Full	Yes - Partial	Yes	Treatment as usual (i.e., traditional psychiatric residential treatment)	Yes	Student SEL knowledge (Strong Teens knowledge test); internalizing symptoms (SSIS); social and emotional resilience (SEARS)	Yes	Strong Teens, a brief and practical social and emotional learning program that teaches youth about positive social, emotional, and behavioral skills in fostering emotional resilience and coping skills; group therapy
McCabe	Yes - Partial	No/Not Reported	Yes	No treatment	Yes	RCMAS-2; BDI-II; callous-unemotional traits (ICU); aggression; positive behaviors	Yes	PM not stated. Four-week yoga program
McDonell	Yes - Partial	No/Not Reported	Yes	Treatment as usual (unspecified)	No	CGAS; amount of prescribed psychiatric medications; NSIB; locked seclusions; length of stay; discharge placement	Yes	Dialectical Behavioral Therapy (DBT); group and/or individual therapy.
Newman	Yes - Partial	No/Not Reported	No	NA	NA	PTSD-RI; BASC-2; MACI	Yes	Trauma Focused Cognitive Behavioral Therapy (TF-CBT); individual therapy
Oxer	Yes - Partial	No/Not Reported	Yes	Treatment as usual (unspecified)	No	Task performance	Yes	PM not stated. Offering choices to youth as a method of promoting task performance
Pierpont	No/Not Reported	No/Not Reported	No	NA	NA	Placement after discharge	Yes	The EARTH program, which heavily involves family/caregivers in residential treatment. Individual therapy, group therapies, family therapy, and parental counseling
Raider	Yes - Partial	No/Not Reported	Yes	Waitlist control group	Yes	TSCC-A; YSR; CAQ	Yes	Trauma Intervention Program for Adjudicated and At-Risk Youth (SITCAP-ART), a structured group therapy for traumatized, adjudicated adolescents in residential treatment designed to diminish terror and trauma responses when exposed to triggers
Rivard	Yes - Partial	No/Not Reported	Yes	Treatment as usual (unspecified)	Yes	COPES-S; critical incidents; Checklist of Child Distress Symptoms; Rosenberg Self-Esteem Scale; N-SLCS; peer form of the Inventory of Parent and Peer Attachment; Parent-Adolescent Communication Scale; YCI; Social Problem Solving Questionnaire; CBCL	Yes	The Sanctuary Model, a method of short-term, inpatient treatment that focuses on creating the best possible therapeutic environment. Residential, therapeutic, and special educational services.

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Table 1 (*continued*)

First author	Presence of internalizing problems	Presence of intellectual and developmental disabilities	Comparison group	Type of comparison	Random assignment	Youth outcome(s)*	Outcome(s) measured at multiple time points	Program model (PM) and Practice Elements (PE) (if information is available*
Robst	Yes - Partial	No/Not Reported	Yes	Treatment as usual (unspecified)	No	CBCL	No	PM not stated. Inpatient psychiatric services such as crisis intervention; biopsychological and/or psychiatric evaluation; close monitoring by staff; medication management; individual, family, and group therapy
Robst	Yes - Partial	No/Not Reported	Yes	Treatment as usual (unspecified)	No	Discharge to a family-like setting; follow-up mental health treatment	No	PM not stated. Residential mental health treatment programs that offer crisis intervention; biopsychological and/or psychiatric evaluation; close monitoring by staff; medication management; individual, family, and group therapy
Rooney	Yes - Unspecified	Yes - Unspecified	Yes	Waitlist control group	Yes	CBCL; Behavior Assessment for Children	Yes	Cognitive-Behavioral Group Anger Management for Youth. Various services including individual therapy and/or pharmacotherapy
Schneider	Yes - Full	Yes - Partial	No	NA	NA	Screen for Child Anxiety-Related Emotional Disorders (SCARED)	Yes	Exposure-Focused Cognitive-Behavioral Therapy, a multimodal residential treatment program for youth with severe anxiety. Youth work through exposure hierarchies while minimizing the use of safety behaviors, attend daily group therapy, and attend experiential therapy groups several times per week
Smith-Toles	Yes - Unspecified	Yes - Unspecified	Yes	Treatment as usual (i.e. traditional treatment approaches)	No	CBCL; YSR	Yes	Multisystemic Therapy modified for residential treatment
Stage	No/Not reported	No/Not Reported	Yes	Treatment as usual	No	Discharge status	No	PM not stated. Anger control group, family therapy, group therapy, individual therapy
Storms	Yes - Full	Yes - Partial	No	NA	NA	Devereux Scales of Mental Disorders	Yes	Modified Cognitive-Behavioral Therapy (AMI Clinical Treatment and Curriculum Manual), designed for an urban population of juvenile offenders with mental health disorders in a community-based residential treatment center consisting of curriculum-based individual, group, and family-based therapies
Sunseri	Yes - Partial	No/Not Reported	Yes	Treatment as usual	No	Premature termination; number of inpatient days; duration of restraints and seclusion	No	Dialectical Behavioral Therapy (DBT). Individual and group therapy.
Wisdom	Yes - Partial	No/Not Reported	No	NA	NA	Restraint and seclusion episodes	Yes	The Positive Alternatives to Restraint and Seclusion (PARS) project, the implementation of six core strategies (e.g., respectful two-way communication between staff and youth, greater involvement of youth in program decision making) to reduce the use of seclusion and restraint

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Table 1 (*continued*)

First author	Presence of internalizing problems	Presence of intellectual and developmental disabilities	Comparison group	Type of comparison	Random assignment	Youth outcome(s)*	Outcome(s) measured at multiple time points	Program model (PM) and Practice Elements (PE) (if information is available*)
Yanchak	Yes - Partial	No/Not Reported	Yes	Waitlist control group	No	School self-efficacy; Perceptions of Educational Barriers Scale	Yes	PM not stated. A brief social-cognitive career intervention to assist adolescents with severe emotional and behavioral disorders in acquiring career decision-making self-efficacy and outcome expectations, acknowledging and understanding barriers to post-secondary education, and increasing coping efficacy; group work

Notes: NA = not applicable; AAQ = Adolescent Attachment Questionnaire; CAFAS = Child and Adolescent Functional Assessment Scale; CBCL = Child Behavior Checklist; SDQ = Strengths and Difficulties Questionnaire; WAI-S = Working Alliance Inventory, Short-Form Revised; CDI = Children's Depression Inventory; SSBS = School Social Behavior Scales; HCSBS = Home & Community Social Behavior Scales; CFARS = Children's Functional Assessment Rating Scale–New Mexico Version; RCMAS-2 = Revised Children's Manifest Anxiety Scale; BDI-II = Beck Depression Inventory-II; CGAS = Child-Global Assessment Scale; NSIB = non-suicidal self-injurious behaviors; PTSD-RI = Child/Adolescent Posttraumatic Stress Disorder Reaction Index; BASC-2 = Behavior Assessment System for Children; MACI = Millon Adolescent Clinical Inventory; TSCC-A = Trauma Symptom Checklist for Children; YSR = Youth Self Report form for problem behaviors; CAQ = Cognitive Avoidance Questionnaire; COPES-S = Community Oriented Program Environment Scale; N-SLCS = Nowicki-Strickland Locus of Control Scale; YCI = Youth Coping Index.

* Based on Lee and Barth (2011)'s "Defining Group Care Programs: An Index of Reporting Standards".

minority or mixed-identity youth, and 13 (28%) studies used samples comprised mostly of racial/ethnic minority or mixed-identity youth.

Turning to the prevalence of behavioral concerns exhibited by youth at intake, four (9%) studies indicated that all youth in the sample exhibited externalizing problems, whereas 35 (74%) studies indicated that a portion of youth in the sample exhibited externalizing problems (12 studies did not report the specific proportion of youth with externalizing problems). Eight (17%) studies did not report information about youth externalizing problems. In terms of psychological concerns exhibited by youth at intake, seven (15%) studies indicated that all youth in the sample exhibited internalizing problems, whereas 32 (68%) studies indicated that a portion of youth in the sample exhibited internalizing problems (8 studies did not report the specific proportion of youth with internalizing problems). Eight (17%) studies did not report information about youth internalizing problems. With respect to the prevalence of intellectual concerns exhibited by youth at intake, 34 (72%) studies did not report relevant information. The remaining 13 (28%) studies indicated that a portion of youth in the sample exhibited symptoms consistent with an intellectual or developmental disability (two studies did not report the specific proportion of youth with an intellectual or developmental disability).

There was also notable variation across studies with respect to research design. Just over half (51%) of studies used a comparison group to bolster the evaluation of an intervention or practice behavior. One-third ($n = 8$) of studies employing a comparison group used random treatment assignment to optimize causal inference. Forty-one (87%) studies collected outcome data at multiple time points.

3.2. *Interventions, youth outcomes, and substantive findings*

Table 2 provides a parsimonious view across studies of interventions, youth outcomes, and key evaluation findings (i.e., whether the study indicated that an intervention was associated with youth outcome improvement). In general, the interventions evaluated across studies can be clustered into one of five categories: (a) modifications to system of treatment, (b) therapeutic modalities, (c) educational/alternative programs, (d) practice behaviors, and (e) post-discharge engagement. We use these categories to simplify the organization of these studies. However, the reader should not take this categorization to mean that the science in this area has been systematically organized in a proactive way. Overall, studies should be considered in each individual context as each focused on a narrow treatment intervention and setting. We have attempted to organize this information retrospectively andsummarize study findings with respect to each of these five clusters.

3.2.1. *Modifications to system of treatment*

Eighteen (38%) studies evaluated an intervention in the form of a modification to an extant system of treatment. Generally, modifications involved infusing existing practices with a new or different broad approach or guiding philosophy. Efforts to increase family involvement in youth treatment was the most studied intervention in this cluster. Studies found that greater family involvement was associated with successful discharge and reduced internalizing and externalizing problems (Anderson, 2013; Armour, 2005; Robst, 2013). Findings associated with linkages between family involvement and youth functioning were mixed; one study found varying associations (ranging from positive to negative) depending on the type and timing of family involvement (Huefner, 2015), and another study found a negative association between family involvement and youth functioning (Boel-Studt, 2017).

Relatedly, several studies evaluated efforts to incorporate an ecological perspective by attending to a variety of social contexts in which youth are embedded—such efforts included the Collaborative Intensive Bridging Services (Dority, 2017), Project Re-Ed (Gamboa, 1974), the EARTH Program (Pierpont, 2004), Positive Behavior Interventions and Supports (Haynes, 2018), and Children and Residential Experiences (Lieberman, 1997). Each of these interventions was associated with

Table 2
Substantive findings across 47 studies included in the systematic review.

		Intervention/Practice Behavior Associated With Outcome Improvement (Over Time and/or Relative to Comparison Condition)		
Intervention	Youth Outcome	Yes	Mixed/Inconclusive	No
Modifications to System of Treatment				
Family involvement	Successful discharge	Anderson, 2013; Robst et al., 2013		
	Functioning		Huefner et al., 2015	Boel-Studt, 2017
	Internalizing and externalizing problems	Robst et al., 2014		
Exceptional Care Program	Functioning	Armour & Schwab, 2005		
	Level-of-care status	Armour & Schwab, 2005		
Wilderness-oriented treatment	Parent attachment		Bettman, 2007	
Trauma-Informed Psychiatric Residential Treatment	Functioning	Boel-Studt, 2017		
	Rates of physical restraints and seclusion	Boel-Studt, 2017		
	Length of stay	Boel-Studt, 2017		
	Level-of-care status			Boel-Studt, 2017
Collaborative Intensive Bridging Services	Number of out-of-home placement days	Dority, 2017		
Teaching Family Model	Psychological and behavioral problems	Farmer et al., 2017		
Project Re-Ed	Adjustment	Gamboa & Garrett, 1974		
The Sanctuary Model	Psychological and behavioral problems		Rivard et al., 2003	
The EARTH Program	Successful discharge	Pierpont & McGinty, 2004		
Positive Behavior Interventions and Supports	Behavioral problems	Haynes, 2018		
Children and Residential Experiences	Behavioral problems	Izzo et al., 2016		
Vocational training program	Task performance	Lieberman et al., 1997		
The Positive Alternatives to Restraint and Seclusion project	Rates of physical restraints and seclusion	Wisdom et al., 2015		
Increasing frequency and duration of treatment	Psychological and behavioral problems		Connor, 2005	
Therapeutic Modalities				
Mode Deactivation Therapy	Physical/sexual aggression	Apsche et al., 2005		
	Internal distress	Apsche et al., 2005		
Trauma Intervention Program for Adjudicated and At-Risk Youth	Trauma and posttraumatic symptoms	Raider et al., 2008		
	Internalizing and externalizing problems	Raider et al., 2008		
Trauma-Focused Cognitive Behavioral Therapy	Psychological and behavioral problems	Newman et al., 2018		
Dialectical Behavioral Therapy	Functioning	McDonell, 2010		
	Amount of prescribed psychiatric medications	McDonell et al., 2010		
	Non-suicidal self-injurious behaviors	McDonell et al., 2010		
	Rates of seclusion			McDonell et al., 2010
	Level-of-care status	Sunseri, 2004		
	Premature termination due to suicidality	Sunseri, 2004		
	Psychiatric hospitalization for self-injurious behaviors	Sunseri, 2004		
The Stop and Go Program	Rates of critical incidents			Cloyd, 2008
Turning the Tides	Posttraumatic symptoms	Bougard et al., 2016		
	Behavioral problems		Bougard et al., 2016	
Family therapy	Length of stay	Corbett, 2005		
	Level-of-care status	Corbett, 2005		
	Functioning	Lakin et al., 2004		
	Successful discharge	Stage, 1999		
Exposure-Focused Cognitive-Behavioral Therapy	Internalizing problems	Schneider et al., 2018		
Modified Multisystemic Therapy	Behavioral problems		Smith-Toles, 2004	
The Cognitive-Behavioral Group Anger Management for Youth	Psychological and behavioral problems	Rooney, 2002		
Modified Cognitive-Behavioral Therapy	Psychological problems	Storms, 2002		
Educational/Alternative Programs				
Mindful Life: Schools	Rates of physical restraints and seclusion	Felver et al., 2017		
Health and wellness group intervention	Physical health	Greyber et al., 2015		
Yoga program	Psychological and behavioral problems		McCabe, 2010	

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Table 2 (*continued*)

Intervention	Youth Outcome	Intervention/Practice Behavior Associated With Outcome Improvement (Over Time and/or Relative to Comparison Condition)		
		Yes	Mixed/Inconclusive	No
Strong Teens	Internalizing problems	Marvin et al., 2017		
	Social and emotional resilience		Marvin et al., 2017	
	Psychological and behavioral problems	Isava, 2007		
Do the Good sports-based program	Rates of physical restraints and seclusion	D'Andrea et al., 2013		
	Psychological and behavioral problems	D'Andrea et al., 2013		
Aggression replacement training program	Behavioral problems			Coleman, 1992
Brief social-cognitive career intervention	Self-efficacy			Yanchack, 2009
Practice Behaviors				
Feelings Thermometer	Rates of physical restraints and seclusion	Andrassy, 2016		
Physical restraint or seclusion	Length of stay			English, 2005
	Functioning			Boel-Studt, 2017
Facilitating youth decision-making	Task performance	Oxer & Miller, 2001		
Promoting therapeutic alliance	Functioning		Gilbert-Eliot, 2014	
	Psychological and behavioral problems	Hurley et al., 2017		
4-to-1 ratio of positive-to-negative interactions between staff and youth	Psychological and behavioral problems	Hurley et al., 2017		
Post-Discharge Engagement				
Post-discharge after-care	Readmission		Foster, 1999	
Youth post-discharge involvement in prosocial activities	Behavioral problems	Brady, 2004		

positive youth outcomes, such as duration of out-of-home placement, adjustment, behavioral well-being, and successful discharge.

Another set of studies evaluated efforts to optimize the therapeutic environment of the treatment facility, although with mixed findings. The Teaching Family Model, which focused on cultivating family-style living arrangements in the treatment facility, was associated with reductions in youth psychological and behavioral problems (Farmer, 2017). In addition, the Positive Alternatives to Restraint and Seclusion project was associated with lower rates of physical restraints and seclusion imposed on youth in treatment (Wisdom, 2015). Conversely, the Sanctuary Model yielded mixed findings in terms of the intervention's association with youth psychological and behavioral problems (Rivard, 2003).

The remaining studies in this cluster each had a unique approach to treatment modification. The Exceptional Care Program, guided by a "no-eject, no-reject" philosophy, was associated with gains in youth functioning and level-of-care status (Armour, 2005). A wilderness-oriented treatment approach was associated with both increases and decreases in youth reports of attachment with their parents (Bettman, 2007). One study found that a trauma-informed approach to psychiatric residential treatment was associated with increases in youth functioning, shorter lengths of stay, and lower rates of physical restraints and seclusion (Boel-Studt, 2017). Another study evaluated a vocational training program, which infused the treatment approach with experiences and activities that were intended to cultivate youths' job-related skills. Results indicated that the approach was associated with improved youth task performance (Lieberman, 1997). The remaining study evaluated shifts in the frequency and duration of youths' general treatment, yielding mixed associations with youth psychological and behavioral problems (Connor, 2005).

3.2.2. *Therapeutic modalities*

Fourteen (30%) studies evaluated an intervention in the form of a therapeutic modality. Modalities rooted in Cognitive Behavioral Therapy (CBT) were the most commonly evaluated across studies in this cluster, with a consistent pattern of findings indicating positive outcome. Engagement in Mode Deactivation Therapy was associated with decreases in youth physical/sexual aggression and levels of internal distress (Apsche, 2005). Participation in Trauma-Focused CBT was associated with declines in youth psychological and behavioral problems (Newman, 2018). Exposure-Focused CBT yielded decreases in youth internalizing problems (Schneider, 2018), a CBT group for anger management yielded decreases in youth psychological and behavioral problems (Rooney, 2002), and Modified CBT yielded decreases in youth psychological problems (Storms, 2002).

Three studies evaluated family therapy as a treatment modality for youth in psychiatric residential treatment. Findings indicated that family therapy was associated with shorter lengths of stay in treatment (Corbett, 2005), transitions to lower level-of-care statuses (Corbett, 2005), higher levels of youth functioning (Lakin, 2004), and higher probability of successful discharge (Stage, 1999). The Trauma Intervention Program for Adjudicated and At-Risk Youth and Turning the Tides, two group-based therapies with a focus on trauma, both yielded decreases in youth posttraumatic symptoms (Bougard, 2016; Raider, 2008). Dialectical Behavioral Therapy (DBT) was associated with increases in youth functioning and decreases in the amount of prescribed psychiatric medications and non-suicidal self-injurious behaviors, but increases in rates of seclusion (McDonell, 2010). DBT was also associated with improved level-of-care status and lower levels of premature termination due to suicidality and psychiatric hospitalization for self-injurious behaviors (Sunseri, 2004). The Stop and Go Program, a social cognitive information processing therapy, was not significantly associated with youth rates of critical incidents (Cloyd, 2008). Modified Multisystemic Therapy yielded mixed or inconclusive findings with respect to youth behavioral problems (Smith-Toles, 2004).

3.2 .3. Educational/alternative modalities

Eight (17%) studies evaluated an intervention in the form of an educational or alternative program. Educational or alternative programs largely took the form of supplemental programs or services in which youth being treated in residential facilities could engage. Mindful Life: Schools, a program focused on secularized yoga and mindfulness practices, was associated with lower rates of youth physical restraints and seclusion (Felver, 2017). Another study evaluating yoga yielded inconclusive findings with respect to youth psychological and behavioral problems (McCabe, 2010). A health and wellness group intervention was associated with improved youth physical health (Greyber, 2015). The program Strong Teens, a brief social and emotional learning program, was associated with decreases in youth psychological and behavioral problems (Isava, 2007; Marvin, 2017); the program was inconclusively associated with youth social and emotional resilience (Marvin, 2017). A sports-based program called Do the Good was associated with lower rates of youth physical restraints and seclusion, as well as lower rates of youth psychological and behavioral problems (D'Andrea, 2013). Neither an aggression replacement training program nor a brief social-cognitive career intervention were significantly associated with youth outcomes (Coleman, 1992, Yanchack, 2009).

3.2 .4. Practice behaviors

Six (13%) studies evaluated an intervention in the form of practice behaviors. Use of a tool called the Feelings Thermometer, which allowed youth to rate their current emotional state when distressed, was associated with decreases in rates of youth physical restraints and seclusion (Andrassy, 2016). Efforts to facilitate youth decision-making while in treatment was associated with higher levels of youth task performance (Oxer, 2001). Promoting the therapeutic alliance and sustaining a 4-to-1 ratio of positive-to-negative interactions between staff and youth were both associated with decreases in youth psychological and behavioral problems (Hurley, 2017); however, promoting the therapeutic alliance was inconclusively associated with youth functioning (Gilbert-Eliot, 2014). Implementing physical restraints or seclusion as a practice behavior was not significantly associated with youth length-of-stay (English, 2005) or functioning (Boel-Studt, 2017).

3.2 .5. Post-Discharge engagement

Two (4%) studies evaluated an intervention in the form of post-discharge engagement. Overall, findings associated with this cluster were mixed. On one hand, one study found that involving youth in prosocial activities following discharge was associated with lower levels of youth behavioral problems (Brady, 2004). On the other hand, another study found that post-discharge after-care efforts yielded inconclusive results with respect to youths' readmission to residential treatment (Foster, 1999).

4. Discussion

The purpose of this systematic review was to gain a better understanding of the evidence supporting use of specific interventions and practice behaviors with youth in the context of PRTFS. Our review did not intend to answer questions about the general effectiveness of residential treatment but whether specific interventions or practices have support for effectiveness in PRTF settings. Indeed, the extant literature contains much variation in PRTF structure, size, staffing ratios and patterns, practice models, and services offered. We suggest that it seems ill advised to attempt judging whether "residential treatment works" in a broad sense, and based on the available evidence, whether specific interventions deployed in PRTFs are effective. Further, current policy and practice initiatives focus on understanding residential treatment not as an intervention, but as a particular setting in which interventions and practice behaviors are implemented (Harrington et al., 2014). Therefore, the need to understand which interventions and practice behaviors are most effective in this treatment context is imperative. The current evidence is insufficient to adequately guide policy or practice; research in this area is desperately needed.

These findings call into question the role of PRTFs and residential/inpatient mental health services more broadly. In the United States, a Medicaid demonstration waiver project (the Community Alternatives to PRTFs Demonstration Grant) provided nine states with funding and flexibility to move their state's children's mental health service system away from PRTF use. The evaluation found reduced costs and improved functioning for children in the demonstration states (Urdapilleta et al., 2012). The move away from inpatient service delivery has been ongoing in the United Kingdom and other European for decades (Lamb, 2009; Shepperd, Gowers, James, Fazel, & Pollack, 2007). Studies of community-based services can certainly benefit from more research using rigorous designs. However, the dearth of research supporting the effectiveness of interventions delivered in PRTFs should be alarming to families, advocates, practitioners, and policymakers. The lack of evidence should not imply that PRTFs are ineffective, but clearly incentivizes are not currently aligned to present evidence regarding whether programs are effective.

As noted earlier, the types of interventions evaluated in the 47 studies captured in our review can be partitioned conceptually as follows: a) modifications to treatment, including bringing a new approach or guiding philosophy to a program such as increasing family involvement or integrating a trauma-informed holistic approach to service delivery; b) incorporating therapeutic modalities such as Trauma-Focused CBT or family therapy; c) incorporating educational or alternative programs; d) establishing practice behaviors, such as encouraging youth emotional expression or decision-making; and e) supporting post-discharge activities, such as increasing prosocial engagement after transition from the residential treatment. Taken together, these findings demonstrate the wide diversity of practice interventions currently deployed in residential treatment settings. Interventions studied range from more "traditional" cognitive-behavioral approaches to more "innovative" practices. They also range in scope, from system-level philosophy changes to practitioner-youth interactions. Overall, we would characterize the breadth and depth of research in this area to be insufficient in providing residential programs and policymakers a clear and firm understanding of "what works" in residential treatment settings for youth.

Clearly, a major implication of our review is the need for more rigorous research in this area and efforts to incentivize the evaluation of ongoing practices in youth PRTFs. We suggest PRTF providers to partner with research institutions or build internal capacity to engage in research intended for peer review. It is possible that PRTFs already engage in rigorous evaluation internal to their organization, but our review suggests that engaging in research to advance knowledge more broadly in this area is needed. Our review also suggests that rigorous study designs (i.e., randomized trials, quasi-experiments) built to assess causal effects of interventions have been used in fewer than ten studies. When randomization is not feasible, researchers can leverage the large amounts of clinical data and administrative information (i.e., Medicaid claims) to balance non-randomized study conditions. The PRTF setting is particularly poised to engage in comparative effectiveness research to compare usual-care interventions with new innovations or implementation of manualized evidence-supported interventions. A similar suggestion from a systematic review of UK research is worth repeating here: "we suggest studies should be designed to compare different models of alternative services in terms of effectiveness and cost, focusing on those services that are most prevalent" (Shepperd et al, 2007, p. 78).

A limitation of our current review is our focus on broadly reviewing the state of evidence for interventions and practice behaviors delivered in residential settings. We did not seek to answer important questions like *what works for whom under what conditions?* This question can be answered in the context of *meta*-analysis, but we have questions where

sufficient evidence exists in the extant literature. Therefore, future research should use study designs that are able to assess average treatment effects but answer questions about what works for whom. We also suggest mental health service research generally, and research in residential care could apply research paradigms now commonly used in medical research such as implementation science and precision medicine to guide future research (Chambers, Feero, & Khoury, 2016).

The majority of articles we reviewed noted improvements in the outcomes tracked; however, as shown in Table 2, studies also yielded mixed, inconclusive, or null results. There was tremendous variation in the outcomes tracked, interventions or practice behaviors evaluated, sample size, and the types of youth served. This variation does not allow for any broad generalizations or conclusions about what interventions are the most effective, and consistently so, within residential treatment settings for youth. Still, this systematic review can serve as a convenient reference that can inform tentatively PRTF stakeholders' decisions about the selection of interventions or practice behaviors. We recommend practitioners and administrators turn to individual studies that are most similar to the context and population in which they practice to inform practice and policy. This systematic review also highlights the gaps in knowledge and challenges of research in residential treatment settings for youth. Additional research may assist in closing some of those gaps, but lack of a standard definition of levels of residential care will likely continue to create obstacles in researching this critical area of children's mental health.

CRediT authorship contribution statement

Paul Lanier: Conceptualization, Data curation, Methodology, Supervision. **Todd Jensen:** Data curation, Methodology, Software, Data curation. **Katherine Bryant:** Data curation, Investigation. **Gerard Chung:** Data curation, Investigation. **Roderick Rose:** Data curation, Investigation. **Quinton Smith:** Data curation, Investigation. **Lisa Lackmann:** Conceptualization.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.childyouth.2020.104951.

References

References marked with an asterisk indicate studies included in the systematic review

*Anderson, M. (2013). Comparing discharges from a children's residential facilities. *Dissertation Abstracts International: Section A. Humanities and Social Sciences*.

*Andrassy, B. M. (2016). Feelings thermometer: An early intervention scale for seclusion/restraint reduction among children and adolescents in residential psychiatric care. *Journal of Child and Adolescent Psychiatric Nursing, 29*(3), 145–147. https://doi.org/10.1111/jcap.12151.

*Apsche, J. A., Bass, C. K., Siv, A. M., & Matteson, S. C. (2005). An empirical "real world" comparison of two treatments with aggressive adolescent males. *International Journal of Behavioral Consultation and Therapy, 1*, 239–251. https://doi.org/10.1037/h0100748.

*Armour, M. P., & Schwab, J. (2005). Reintegrating children into the system of substitute care: Evaluation of the exceptional care pilot project. *Research on Social Work Practice, 15*(5), 404–417. https://doi.org/10.1177/1049731505276650.

*Bettmann, J. (2007). Changes in adolescent attachment relationships as a response to wilderness treatment. *Journal of the American Psychoanalytic Association, 55*(1), 259–265. https://doi.org/10.1177/00030651070550010103.

*Boel-Studt, S. M. (2017). A quasi-experimental study of trauma-informed psychiatric residential treatment for children and adolescents. *Research on Social Work Practice, 27*(3), 273–282. https://doi.org/10.1177/1049731515614401.

*Bougard, K. G., Laupola, T. M. T., Parker-Dias, J., Creekmore, J., & Stangland, S. (2016). Turning the tides: Coping with trauma and addiction through residential adolescent group therapy. *Journal of Child and Adolescent Psychiatric Nursing, 29*(4), 196–206. https://doi.org/10.1111/jcap.12164.

*Brady, K. L. (2004). Children in residential treatment: Factors associated with outcome one-year after discharge. *Dissertation Abstracts International: Section B. The Sciences and Engineering.*.

Centers for Disease Control and Prevention. (2019). Data and statistics on children's mental health. Retrieved from: https://www.cdc.gov/childrensmentalhealth/data.html.

Centers for Medicare and Medicaid Services. (n.d.). Psychiatric residential treatment facilities (PRTF): General requirements and conditions of participation. Retrieved from: https://www.cms.gov/Outreach-and-Education/American-Indian-Alaska-Native/AIAN/PRTFGeneralRequirementsandConditionsofParticipation.pdf.

Chambers, D. A., Feero, W. G., & Khoury, M. J. (2016). Convergence of implementation science, precision medicine, and the learning health care system: A new model for biomedical research. *JAMA, 315*(18), 1941–1942. https://doi.org/10.1001/jama.2016.3867.

*Cloyd, C. J. (2008). Evaluation of the efficacy of a manualized aggression prevention program for adolescents in residential treatment. *Dissertation Abstracts International: Section B. The Sciences and Engineering.*.

*Coleman, M., Pfeiffer, S., & Oakland, T. (1992). Aggression replacement training with behaviorally disordered adolescents. *Behavioral Disorders, 18*, 54–66.

Cooper, H. (2010). *Research synthesis and meta-analysis: A step-by-step approach* (4th ed.). Thousand Oaks, CA: SAGE.

*Conner, T., & Koeske, G. (2005). The impact of mental health treatment intensity on the emotional and behavioral problems of youth in a residential treatment facility. *Journal of Evidence-Based Social Work, 2*, 35–47.

*Corbett, K. F. (2005). The relationship between family therapy and positive treatment outcomes for children with bipolar disorder. *Dissertation Abstracts International: Section B. The Sciences and Engineering.*.

*D'Andrea, W., Bergholz, L., Fortunato, A., & Spinazzola, J. (2013). Play to the whistle: A pilot investigation of a sports-based intervention for traumatized girls in residential treatment. *Journal of Family Violence, 28*(7), 739–749. https://doi.org/10.1007/s10896-013-9533-x.

*Dority, T. M. (2017). The effect of CIBS participation and gender on adolescent residential treatment duration. *Dissertation Abstracts International: Section B. The Sciences and Engineering.*.

*English, K. A. (2005). Factors affecting length of stay in residential treatment for children with serious emotional disturbance. *Dissertation Abstracts International: Section A. Humanities and Social Sciences.*.

Family and Youth Services Bureau. (2012). What is evidence-based practice? Retrieved from: https://www.acf.hhs.gov/sites/default/files/fysb/evidencebasedpractice20120829.pdf.

*Farmer, E. M. Z., Seifert, H., Wagner, H. R., Burns, B. J., & Murray, M. (2017). Does model matter? Examining change across time for youth in group homes. *Journal of Emotional and Behavioral Disorders, 25*(2), 119–128. https://doi.org/10.1177/1063426616630520.

*Felver, J. C., Jones, R., Killam, M. A., Kryger, C., Race, K., & McIntyre, L. L. (2017). Contemplative intervention reduces physical interventions for children in residential psychiatric treatment. *Prevention Science, 18*(2), 164–173. https://doi.org/10.1007/s11121-016-0720-x.

*Foster, E. M. (1999). Do aftercare services reduce inpatient psychiatric readmissions? *Health Services Research, 34*(3), 715–736.

*Gamboa, A. M. J., & Garrett, J. E. (1974). Re-education: A mental health service in an educational setting. *American Journal of Orthopsychiatry, 44*(3), 450–453. https://doi.org/10.1111/j.1939-0025.1974.tb00898.x.

*Gilbert-Eliot, T. (2014). The therapeutic alliance in adolescent residential treatment: Enhanced outcome or multiple relationships? *Dissertation Abstracts International: Section B. The Sciences and Engineering.*.

*Greyber, L. R., Dulmus, C. N., Cristalli, M., & Jorgensen, J. (2015). A single group pre-posttest examination of a health and wellness intervention on body mass index for adolescent females with severe emotional disorders and histories of trauma. *Child and Adolescent Social Work Journal, 32*(2), 187–198. https://doi.org/10.1007/s10560-014-0341-9.

Harrington, K., Williams-Washington, K., Caldwell, B., Lieberman, R. E., & Blau, G. (2014). Improving outcomes in residential. In G. M. Blau, B. Caldwell, & R. E. Lieberman (Eds.). *Residential interventions for children, adolescents, and families* (pp. 21–27). New York: Routledge.

*Haynes, R. D. (2018). Agency-wide positive behavioral interventions and supports for residential care. *Dissertation Abstracts International: Section B. The Sciences and Engineering.*.

*Huefner, J. C., Pick, R. M., Smith, G. L., Stevens, A. L., & Mason, W. A. (2015). Parental involvement in residential care: Distance, frequency of contact, and youth outcomes. *Journal of Child and Family Studies, 24*(5), 1481–1489. https://doi.org/10.1007/s10826-014-9953-0.

*Hurley, K. D., Lambert, M. C., Gross, T. J., Thompson, R. W., & Farmer, E. M. Z. (2017).

The role of therapeutic alliance and fidelity in predicting youth outcomes during therapeutic residential care. *Journal of Emotional and Behavioral Disorders, 25*(1), 37–45. https://doi.org/10.1177/1063426616686756.

*Isava, D. M. (2007). An investigation on the impact of a social emotional learning curriculum on problem symptoms and knowledge gains among adolescents in a residential treatment center. *Dissertation Abstracts International: Section B. The Sciences and Engineering.*.

*Izzo, C. V., Smith, E. G., Holden, M. J., Norton, C. I., Nunno, M. A., & Sellers, D. E. (2016). Intervening at the setting level to prevent behavioral incidents in residential child care: Efficacy of the CARE program model. *Prevention Science, 17*(5), 554–564. https://doi.org/10.1007/s11121-016-0649-0.

*Lakin, B. L., Brambila, A. D., & Sigda, K. B. (2004). Parental involvement as a factor in the readmission to a residential treatment center. *Residential Treatment for Children & Youth, 22*, 37–52. https://doi.org/10.1300/J007v22n02_03.

Lee, Bethany R., & Barth, Richard P. (2011). Defining Group Care Programs: An Index of Reporting Standards. *Child Youth Care Forum, 40*(4), 253–266. https://doi.org/10.1007/s10566-011-9143-9.

Lamb, C. E. (2009). Alternatives to admission for children and adolescents: Providing intensive mental healthcare services at home and in communities: what works? *Current Opinion in Psychiatry, 22*(4), 345–350.

Lanier, P., & Rose, R. A. (2017). Admission to psychiatric residential treatment facilities among youth from families investigated for maltreatment. *Journal of Child and Family Studies, 26*(1), 306–316.

*Lieberman, R. E., & den Dunnen, W. (2014). Residential interventions: A historical perspective. In G. M. Blau, B. Caldwell, & R. E. Lieberman (Eds.). *Residential interventions for children, adolescents, and families: A best practice guide* (pp. 8–14). New York: Routledge.

Lieberman, R., Fujitsubo, L., & Murray, P. D. (1997). A prevocational training project for emotionally disturbed adolescents. *Behavioral Interventions, 12*, 41–54.

Liberati, A., Altman, D. G., Tetzlaff, J., Mulrow, C., Gøtzsche, P. C., Ioannidis, J., ... Moher, D. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: Explanation and elaboration. *Journal of Clinical Epidemiology, 62*, e1–e34. https://doi.org/10.1016/j.jclinepi.2009.06.006.

Littell, J., Corcoran, J., & Pillai, V. (2008). *Systematic reviews and meta-analysis.* New York: Oxford University Press https://doi.org/10.1093/acprof:oso/9780195326543.001.0001.

Loy, J. H., Merry, S. N., Hetrick, S. E., & Stasiak, K. (2017). Atypical antipsychotics for disruptive behaviour disorders in children and youths. *Cochrane Database of Systematic Reviews*(8), https://doi.org/10.1002/14651858.CD008559.pub3.

Lyons, J. S., Woltman, H., Martinovich, Z., & Hancock, B. (2009). An outcomes perspective of the role of residential treatment in the system of care. *Residential Treatment for Children & Youth, 26*(2), 71–91. https://doi.org/10.1080/08865710902872960.

*Marvin, L. A., Caldarella, P., Young, E. L., & Young, K. R. (2017). Implementing Strong Teens for adolescent girls in residential treatment: A quasi-experimental evaluation. *Residential Treatment for Children & Youth, 34*(3–4), 183–202. https://doi.org/10.1080/0886571X.2017.1394247.

*McCabe, K. M. (2010). The effects of yoga on symptoms associated with conduct disorder with callous unemotional traits as a moderator. *Dissertation Abstracts International: Section B. The Sciences and Engineering.*.

*McDonell, M. G., Tarantino, J., Dubose, A. P., Matestic, P., Steinmetz, K., Galbreath, H., & McClellan, J. M. (2010). A pilot evaluation of dialectical behavioural therapy in adolescent long-term inpatient care. *Child and Adolescent Mental Health, 15*(4), 193–196. https://doi.org/10.1111/j.1475-3588.2010.00569.x.

McKibbon, K. A. (1998). Evidence-based practice. *Bulletin of the Medical Library Association, 86*(3), 396–401.

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *Annals of Internal Medicine, 151*(4), 264–269. https://doi.org/10.7326/0003-4819-151-4-200908180-00135.

*Newman, J. L. E., Falligant, J. M., Thompson, K. R., Gomez, M. D., & Burkhart, B. R. (2018). Trauma-focused cognitive behavioral therapy with adolescents with illegal sexual behavior in a secure residential treatment facility. *Children and Youth Services Review, 91*, 431–438. https://doi.org/10.1016/j.childyouth.2018.06.028.

*Oxer, S. S., & Miller, B. K. (2001). Effects of choice in an art occupation with adolescents living in residential treatment facilities. *Occupational Therapy in Mental Health, 17*(1), 39–49.

*Pierpont, J. H., & McGinty, K. (2004). Using family-oriented treatment to improve placement outcomes for children and youth in residential treatment. *Journal of Human Behavior in the Social Environment, 9*, 147–163.

*Raider, M. C., Steele, W., Delillo-Storey, M., Jacobs, J., & Kuban, C. (2008). Structured sensory therapy (SITCAP-ART) for traumatized adjudicated adolescents in residential treatment. *Residential Treatment for Children & Youth, 25*, 167–185. https://doi.org/10.1080/08865710802310178.

Ringle, J. L., Huefner, J. C., James, S., Pick, R., & Thompson, R. W. (2012). 12-month follow-up outcomes for youth departing and integrated residential continuum of care. *Children and Youth Services Review, 34*(4), https://doi.org/10.1016/j.childyouth.2011.12.013.

*Rivard, J. C., Bloom, S. L., Abramovitz, R., Pasquale, L. E., Duncan, M., McCorkle, D., & Gelman, A. (2003). Assessing the implementation and effects of a trauma-focused intervention for youths in residential treatment. *Psychiatric Quarterly, 74*(2), 137–154. https://doi.org/10.1023/A:1021355727114.

*Robst, J., Rohrer, L., Armstrong, M., Dollard, N., Sharrock, P., Batsche, C., & Reader, S. (2013). Family involvement and changes in child behavior during residential mental health treatment. *Child & Youth Care Forum, 42*(3), 225–238. https://doi.org/10.1007/s10566-013-9201-6.

*Robst, J., Rohrer, L., Dollard, N., & Armstrong, M. (2014). Family involvement in treatment among youth in residential facilities: Association with discharge to family-like setting and follow-up treatment. *Journal of Emotional and Behavioral Disorders, 22*(3), 190–196. https://doi.org/10.1177/1063426614523651.

*Rooney, J. R. (2002). Effects of cognitive-behavioral group anger management with adolescent males in a residential treatment facility. *Dissertation Abstracts International: Section B. The Sciences and Engineering.*.

Rose, R. A., & Lanier, P. (2017). A longitudinal study of child maltreatment and mental health predictors of admission to psychiatric residential treatment facilities. *International Journal of Environmental Research and Public Health, 14*(10), 1141. https://doi.org/10.3390/ijerph14101141.

*Schneider, S. C., Buissonniere-Ariza, V. La., Hojgaard, D. R. M. A., Kay, B. S., Riemann, B. C., Eken, S. C., ... Storch, E. A. (2018). Multimodal residential treatment for adolescent anxiety: Outcome and associations with pre-treatment variables. *Child Psychiatry & Human Development, 49*(3), 434–442. https://doi.org/10.1007/s10578-017-0762-8.

Shea, B. J., Bouter, L. M., Peterson, J., Boers, M., Andersson, N., Ortiz, Z., ... Grimshaw, J. M. (2007). External validation of a measurement tool to assess systematic reviews (AMSTAR). *PLoS one, 2*(12).

Shepperd, S., Gowers, G., James, T., Fazel, M., & Pollack, J. (2007). Systematic review and mapping study of alternatives to inpatient care for children and adolescents with complex mental health needs. Alternatives to inpatient mental healthcare for children and adolescents. Report for the National Institute for Health Research Service Delivery and Organisation Programme. National Coordinating Centre for the Service Delivery and Organisation (NCCSDO).

*Smith-Toles, M. D. (2004). Mental health and related behavioral problems in children and adolescents: Modified multisystemic versus traditional therapy in residential treatment. *Dissertation Abstracts International: Section B. The Sciences and Engineering*.

*Stage, S. A. (1999). Predicting adolescents' discharge status following residential treatment. *Residential Treatment for Children & Youth, 16*(3), 37–56. https://doi.org/10.1300/J007v16n03_03.

Storebø, O. J., Pedersen, N., Ramstad, E., Kielsholm, M. L., Nielsen, S. S., Krogh, H. B., ... Skoog, M. (2018). Methylphenidate for attention deficit hyperactivity disorder (ADHD) in children and adolescents–assessment of adverse events in non-randomised studies. *Cochrane Database of Systematic Reviews, Issue*, 5.

*Storms, T. L. (2002). The efficacy of the AMI clinical treatment and curriculum manual for male adolescents with co-existing mental health and aggression-based syndromes: A program evaluation. *Dissertation Abstracts International: Section B. The Sciences and Engineering* ProQuest Information & Learning.

Substance Abuse and Mental Health Services Administration. (2016). National mental health services survey (N-MHSS): 2016 data on mental health treatment facilities (Publication No. (SMA) 17-5049). Retrieved from: https://www.samhsa.gov/data/sites/default/files/2016_National_Mental_Health_Services_Survey.pdf.

*Sunseri, P. A. (2004). Preliminary outcomes on the use of dialectical behavior therapy to reduce hospitalization among adolescents in residential care. *Residential Treatment for Children & Youth, 21*(4), 59–76. https://doi.org/10.1300/J007v21n04_06.

Sunseri, P. A. (2005). Children referred to residential care: Reducing multiple placements, managing costs and improving treatment outcomes. *Residential Treatment for Children & Youth, 22*(3), 55–66. https://doi.org/10.1300/J007v22n03_04.

Urdapilleta, O., Kim, G., Wang, Y., Howard, J., Varghese, R., Waterman, G., ... Palmisano, C. (2012). *National evaluation of the Medicaid demonstration waiver home- and community-based alternatives to psychiatric residential treatment facilities: Final report.* Columbia, MD: IMPAQ International, Routledge.

U.S. Department of Health and Human Services (2013). Report to the president and congress: Medicaid home and community-based alternatives to psychiatric residential treatment facilities demonstration. Retrieved from: https://www.medicaid.gov/medicaid-chip-program-information/by-topics/delivery-systems/institutional-care/downloads/prtf-demo-report.pdf.

U.S. Government Accountability Office (2008). Residential facilities: Improved data and enhanced oversight would help safeguard the well-being of youth with behavioral and emotional challenges (Report No. GAO-08-346). Retrieved from: https://www.gao.gov/new.items/d08346.pdf.

U.S. Office of Juvenile Justice and Delinquency Prevention (2011). Residential treatment centers. Retrieved from: https://www.ojjdp.gov/mpg/litreviews/Residential_Treatment_Centers.pdf.

*Wisdom, J. P., Wenger, D., Robertson, D., Bramer, J. Van, & Sederer, L. I. (2015). The New York state office of mental health positive alternatives to restraint and seclusion (pars) project. *Psychiatric Services, 66*(8), 851–856. https://doi.org/10.1176/appi.ps.201400279.

*Yanchak, K. V. (2009). A career intervention for adolescents with emotional and behavioral disorders. *Dissertation Abstracts International: Section B. The Sciences and Engineering*.