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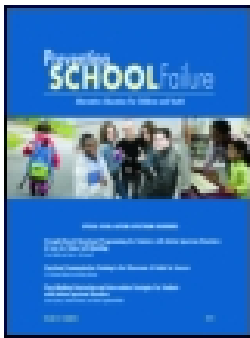
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An examination of the feasibility and implementation fidelity of a multi-component treatment program for students with EBD

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ABSTRACT

The practice of serving students with emotional and behavioral challenges in the United States has been fraught with anxiety, fear, and stress. Fortunately, researchers in the field of emotional and behavioral disorders (EBD) have identified a range of empirically supported interventions to improve outcomes for students with EBD. This study sought to examine the feasibility of TIERS, a special education-based treatment program for students with EBD, in 10 self-contained classrooms. Despite the provision of multiple evidence-based supports for implementation, two and a half years of fidelity data indicated that none of the participating classrooms fully implemented the program as intended. These findings raise at least some concern regarding the practicality of the TIERS program, as designed, for its targeted setting/population. Study limitations and future directions are discussed.

Public schools are designed to deliver instructional programs that shape the learning and development of students. However, realizing this goal for students with emotional and behavioral disorders (EBD) has proven to be particularly challenging. Studies have repeatedly shown students with EBD struggle with academics (Maggin et al., 2016b), lack social-emotional skills, and demonstrate problem behaviors (Maggin et al., 2016a). They perform at a lower level across subjects, including reading and mathematics, when compared to peers without and with learning disabilities (Reid et al., 2004; Sabornie et al., 2006); exhibit social and emotional skills deficiencies that result in negative interactions with others (Gresham et al., 2006; Polsgrove & Smith, 2004); and manifest behavioral patterns that affect the teaching and learning processes in the classroom, including internalizing behaviors (e.g., signs of withdrawal, anxiety, and depression; Christensen et al., 2007) and externalizing behaviors (e.g., physical aggression, property destruction; White & Renk, 2012). Given the multiple challenges faced by this unique group of students, the dismal educational and post-secondary outcomes (e.g., poorer grades in school, lower rate of graduation from high school, higher rate of unemployment and mental health problems; Unruh & Murray, 2014; Wagner, 2014; Wagner et al., 2005) tend to be more expected than surprising.

Special education has played an important role in addressing the challenges observed among this population. The literature suggests that students with EBD often have needs that require support services beyond those that can be feasibly provided in mainstream educational settings (Landrum et al., 2003; Lane et al., 2005), making them arguably the most challenging for inclusion in general education classrooms (Visser et al., 2010). This has resulted in the use of special education self-contained classrooms which are separate from general education classrooms and primarily serve students with disabilities, a notoriously controversial practice that has polarized scholars for decades (Causton-Theoharis et al., 2011; Landrum et al., 2018) but remains routine in the field and is supported by documented court cases such as *MR v. Lincolnwood Board of Education* and *Clyde K. and Sheila K. v. Puyallup School District* (Jones et al., 2004; Yell, 1995). Based on the most recent statistics reported by the U.S. Department of Education (2020), a little over one-third of the nearly 350,000 students receiving services under the classification of EBD spend more than 60% of their school day in self-contained classrooms.

Improving the services for students with EBD has been a priority for the U.S. DOE since the 1960s (Bradley et al., 2004), and researchers have fervently responded with studies to identify interventions to ameliorate the deplorable academic, social-emotional, and behavioral outcomes recognized in large majorities of students with EBD across grade levels. Fortunately, their efforts have contributed to a research base on effective interventions for these students that continues to grow, slowly but surely inching us toward better services. In addition to individual intervention strategies (e.g., behavior specific praise, social skills training, group contingencies), a variety of treatment packages (e.g., the BASE [Farmer et al., 2020], BEST in CLASS [Conroy et al., 2015; Sutherland et al., 2018], and Incredible Years [Webster-Stratton, 2001] programs) have been developed and marketed as potential solutions to the complex issue of educating students with EBD. Regretfully, outcomes for students with EBD have remained largely unchanged for the last three decades (Freeman et al., 2019) and there is a dire need for effective programming that can be feasibly delivered in classroom

settings. Among the available treatment package options is the Tiers of Intensive Educationally Responsive Services (TIERS) program (Cook & Browning Wright, 2009). This study begins the empirical evaluation of the feasibility of the multi-component TIERS treatment package.

Overview of the TIERS program

The design of TIERS is intended to improve the academic, social-emotional, and behavioral outcomes of students with EBD in restrictive settings including self-contained classrooms on general education, alternative day school classrooms, and nonpublic school campuses. Following multi-tiered support system (MTSS) logic, TIERS organizes interventions across a tiered continuum to provide multiple levels of support at varying levels of intensity that is matched to the individual needs of students. The three tiers include (a) Intensified Level 1 (for all students), which is comprised of 14 intervention components; (b) Intensified Level 2 (for some students), which includes behavior contracting, self-monitoring, school-home note system, and mentor-based support (to be added to the interventions provided in Level 1); and (c) Intensified Level 3 (for a limited few students) which includes cognitive behavior therapy, behavior intervention plan based on a functional behavior assessment, wraparound services, and parent training (to be added to the interventions provided in Levels 1 and 2) (Cook & Browning Wright, 2014).

Given the complex and unique symptomatology associated with EBD both within and across students, its multi-component treatment approach that targets multiple aspects of functioning seems intuitive. The 14 intervention components of TIERS (Intensified Level 1) include: (a)

establish, maintain, and restore positive relationships, (b) establish physiology to learn, (c) positive behavior supports, (d) social-emotional learning curricula, (e) proactive classroom management strategies, (f) good behavior game, (g) points and levels system, (h) progressive response system for problem behavior, (i) honors room and outings, (j) reboot room for reflective time, (k) effective academic instruction, (l) relentless outreach to parents, (m) daily debriefs among staff, and (n) self-governance meetings. See Table 1 for a brief description of each intervention component.

The intervention components of TIERS (Intensified Level 1) align with practices that are supported by empirical evaluation (see Table 2), but the strength of the evidence for each component varies. In fact, many of the practices recommended for students with EBD are based on studies that are limited in their generalizability to this student group in educational settings. The supporting evidence often fails to include students with EBD (Cipriano et al., 2016); and when they do, they are generally limited in focus (i.e., target one specific disorder or symptom), rigid in the number and order of treatments that occur (i.e., prescribe a specific sequence of sessions), and based on implementation considerations and empirical evidence gleaned from clinical settings (Kratochwill et al., 2012).

Significant resources are required to operate TIERS classrooms and should also be noted. As recommended by Cook and Browning Wright (2009), delivery of the model requires "[a] teacher, paraeducator(s), administrator, and additional support staff" (p. 28). The teacher and paraeducator(s) are responsible for carrying out Intensified Level 1 supports; the administrator helps obtain necessary resources, works with students referred to the office, and holds service

Table 1. Fourteen intervention components of TIERS (Intensified Level 1).

Intervention component	Brief description
1. Establish, maintain, and restore positive relationships	Spend individual time with students, keep track of relevant information about the student (e.g., likes/dislikes, special occasions) and reference, aim for a 5:1 ratio of positive to negative interactions, attend to positive behaviors, and follow a four-step process for restoring relationships after damage.
2. Establish physiology to learn	Provide instruction for stress inoculation, sleep, exercise, and diet.
3. Positive behavior supports	Teach, model, and reinforce common behavioral expectations.
4. Social-emotional Learning Curricula	Provide social skills instruction and implement social-emotional learning curricula.
4. Proactive management strategies	Organize the physical space, establish rules, manage transitions and independent seatwork, and use effective communication skills with students (e.g., structured teaching interactions, delivering effective praise, and deescalating students in an agitated state with a calm and compassionate demeanor).
5. Good behavior game	Play the Good Behavior Game, an interdependent group contingency management procedure, during times in which students are most likely to engage in problem behaviors.
6. Points and levels system	Use a token economy with a points and levels system. Tokens earned can be exchanged for access to reinforcing items/activities.
7. Progressive response system for problem behavior	Use a progressive system for responding to problem behaviors that follows a sequence of (a) proximity control, (b) redirection, (c) ongoing monitoring, (d) prompt, and (e) teaching interaction.
8. Honors room and outings	Honors room and outings are considered rewards within the points and levels system. The Honors room is a designated space at the site that is furnished with a variety of highly reinforcing items, while Honors outings are supervised field trips to community settings.
9. Reboot room for reflective time	Use an isolated timeout procedure and send students to the Reboot room for behavior violations that are dangerous, destructive to property, or significantly disruptive. Use an overcorrection procedure and require students in the Reboot room to perform restitution tasks. Before leaving, students inside the Reboot room are to reflect on their actions, identify replacement behaviors, and develop a plan for handling the situation better next time.
10. Effective academic instruction	Use direct instruction, scaffold independent seatwork, and incorporate student interests to maximize engagement.
11. Relentless outreach to parents	Maintain ongoing school-home communications between teachers and parents.
12. Daily debriefs among staff	Conduct brief, daily program meetings to allow classroom staff the opportunity to address programmatic issues.
13. Self-governance meetings	Conduct brief, daily meetings with students to practice prosocial skills and allow students to provide input about their classroom.

Table 2. Sample of literature that aligns with the 14 intervention components of TIERS (intensified Level 1).

Intervention component	Citation
1. Establish, maintain, and restore positive relationships	Sointu et al. (2017)
2. Establish physiology to learn	Bundy et al. (2018)
3. Positive behavior supports	Lukowiak (2010)
4. Social-emotional Learning Curricula	Durlak et al. (2011)
5. Proactive management strategies	Herman et al. (2022)
6. Good behavior game	Rubow et al. (2018)
7. Points and levels system	Pritchard et al. (2018)
8. Progressive response system for problem behavior	Shepley et al. (2019)
9. Honors room and outings	Bowman-Perrott et al. (2013)
10. Reboot room for reflective time	O'Handley et al. (2019)
11. Effective academic instruction	Morris et al. (2021)
12. Relentless outreach to parents	Duppong Hurley et al. (2019)
13. Daily debriefs among staff	Feuerborn et al. (2013)
14. Self-governance meetings	Flynn and Colby (2017)

providers accountable for implementation; and support staff (i.e., behavior specialist and school counselor/psychologist/social worker) help collect/interpret/use data to inform programming decisions and deliver Intensified Level 2 and 3 supports.

Feasibility, implementation fidelity, and contextual fit of intervention programs

In education research, feasibility is defined as "the extent to which those who implement… an intervention can practically do so within an identified authentic setting" (Gagnon & Barber, 2018, p. 668). Hence, most feasibility studies aim to describe information related to whether an intervention can be successfully implemented (Institute of Education Sciences (IES),), 2013; Tickle-Degnen, 2013) including data on implementation fidelity (Bowen et al., 2009; Dusenbury et al., 2003; O'Donnell, 2008) which refers to the extent an intervention is applied according to its prescribed procedures (Proctor et al., 2011; Sanetti et al., 2021). Based on the extant research, higher levels of implementation fidelity across a range of school-based treatment programs are associated with better outcomes (Durlak et al., 2010; Durlak & DuPre, 2008; Gearing et al., 2011). In contrast, poor fidelity is associated with little to no positive change (Noell et al., 2002). As the saying goes, "Even the most effective program cannot produce good results if it is not implemented properly" (Foster & Bussman, 2008, p. 422). Despite this, many intervention studies have failed to consider fidelity (Power et al., 2005; Smith et al., 2007), including those for students with EBD (Griffith et al., 2009; Sutherland et al., 2013; Wheeler et al., 2014).

When discussing feasibility and implementation fidelity, it is important to also consider the critical role of contextual fit and its potential impact on school-based intervention efforts. Teachers have frequently reported that they are more concerned with the "fit" of an intervention with student needs and whether it can be feasibly implemented than the evidence-base supporting it (Boardman et al., 2005; Stahmer et al., 2005). This perspective is often cited in the implementation science and research-to-practice gap

literature as a common cause of degradation of fidelity and effectiveness (Cabassa & Baumann, 2013; Forman et al., 2013; Parsons et al., 2013). Erosion of fidelity and subsequent effectiveness has also been observed in instances where multiple interventions are implemented simultaneously (e.g., as part of a manualized program; Jones, 2013). At some point, the availability of time and resources; staff availability; or implementer knowledge, skill, or stamina may result in deviation from intended implementation, in part or in whole, for one or more of a program's components (Borrelli, 2011). To address these potential implementation shortcomings, program developers and researchers have advocated for ongoing implementer supports through direct training (Sterling-Turner et al., 2002), coaching (Reinke et al., 2014; Snyder et al., 2015), consultation and performance feedback (Sanetti et al., 2013), and "booster" trainings (Miller et al., 2014). In short, additional external supports provided on an ongoing basis are believed to increase feasibility and fidelity.

While the importance of using evidence-based interventions to support students cannot be overstated, some have noted the tendency to attribute the failure of some programs to produce desired outcomes to poor implementation by school-based practitioners (Ennett et al., 2011; Howlin et al., 2007; Stahmer et al., 2015) rather than the program itself (Parsons et al., 2013). The latter acknowledges the importance of feasibility when establishing an evidence base for any intervention program. A dogged emphasis on a program's evidence base alone conveys the idea that practitioners should adapt to practices as prescribed and ignores implementer needs, perspectives, and expertise, as well as the unique setting (Parsons et al., 2013). Thus, the intentional focus on feasibility and fidelity offers opportunities for increasing the likelihood of success in transferring an approach from theory to practice (Ogletree et al., 2007; Parsons et al., 2013). By explicitly examining feasibility and implementation fidelity of intervention programs, researchers can identify potential implementation challenges (e.g., implementer perceptions, program design issues).

The current study

The developers of TIERS have acknowledged that "[it] has not been rigorously evaluated [but made the case that] each of the procedures is evidence-based" (Cook & Browning Wright, 2009, p. 20). While there may be compelling evidence that supports individual components of TIERS, to assume that the treatment package in whole can be feasibly implemented with fidelity for students with EBD in self-contained classrooms would be a fallacy of defective induction (i.e., an assumption that is not based on sufficient supporting evidence). To the authors' knowledge, no peer reviewed studies evaluating the feasibility of TIERS have been published in any scientific journal. Thus, the current study sought to examine (a) the degree to which the intervention components can be implemented, and (b) whether the program model is able to be carried out as designed in self-contained classrooms serving students with EBD.

Method

Participants

Sixty surveys of implementation fidelity were obtained across five different time points between spring 2016 and spring 2018. Respondents were six education professionals (i.e., special education teacher, site administrator, school psychologist, behavior specialist, mental health counselor, and special education local planning area mental health specialist) across 10 self-contained classrooms located in southern California (two on elementary school campuses, two on middle school campuses, and six on high school campuses). All classrooms were designed to implement TIERS (Intensified Level 1) and served students with EBD that failed to make adequate educational progress despite the intervention efforts of the local education agency (LEA), which included special education support in the general education setting, special day class support (more than 50% of the school day outside of general education), designated instructional services (DIS) in areas of suspected need, and intensive mental health interventions for a minimum of three to six months.

Implementation of the TIERS model began in fall 2013. At the time of the first survey administration in this study (spring 2016), the 10 classrooms were in the latter half of their second year of implementation. Fall 2016 and fall 2017 was the beginning of their third and fourth year of implementation, respectively.

Implementation supports for participants

Multiple services were provided throughout the time surveyed to help support the implementation of the TIERS model across the 10 classrooms. Since fall 2013, a two-day training event (i.e., didactic workshop consisting of lecture- and discussion-based activities) on the implementation of the program was held at the beginning of each academic year for the education professionals surveyed at each site. Reference materials were also provided to the education professionals, which included information related to staff roles, the TIERS model, and procedures for Intensified Level 1 supports. There was no differentiation of training or materials between those participants that served elementary, middle, or high school sites.

In the winter of each academic year, the TIERS program trainer (i.e., one of the developers of the program) visited each site, conducted an observation, and then provided performance feedback to staff on their implementation of program components in a follow-up meeting. Furthermore, a local planning area mental health specialist with expert knowledge of the program design and implementation procedures provided ongoing guidance via telephone and e-mail to service providers; and visited each site at least once every two weeks to meet for at least one hour and engage in collaborative consultation with the site team (i.e., classroom teacher, paraeducators, site administrator, and support staff) on an ongoing basis (i.e., throughout the duration of this study).

Measure

TIERS fidelity of implementation survey (TIERS-FIS)

Systematic reviews of measures used to assess fidelity in intervention research (e.g., Maynard et al., 2013) have consistently included observation and self-report measures. A tool for evaluating fidelity was not included in the TIERS program materials. The current study used the results of the TIERS-FIS, a brief, researcher-developed, self-report questionnaire adopted by the local plan area to assess the extent to which the 14 intervention components of TIERS were applied according to prescribed procedures. Consistent with Walton et al. (2020)'s recommendations for developing quality fidelity measures for complex interventions, items were based on the treatment program's key ingredients; the questionnaire consisted of 14 items that corresponded to each of the intervention components. For each item, a brief operational definition of the intervention component was provided (see Table 3 for a sample of the TIERS-FIS items) and respondents were asked to rate the degree to which it was implemented in their respective classroom using a three-point scale (1 = little to no implementation, 2 = partial implementation but not at fidelity, and 3 = full implementation at fidelity). Following best practice in the collection of fidelity data, multiple raters were solicited (Lorencatto et al., 2013; Walton et al., 2020) at each survey administration time point for each site.

The intra-class correlation (ICC) coefficient was calculated for each program to evaluate the level of inter-rater agreement on ratings of implementation fidelity by site across all time points (see Table 4) which offers some preliminary evidence of reliability of the TIERS-FIS. ICCs are commonly used to assess inter-rater agreement and most suitable when there are more than two raters (Hallgren, 2012). The range of the ICC coefficient is 0 to 1. ICC values less than .40 are considered poor, between .40 and .59 are considered fair, .60

Table 3. Sample of TIERS-FIS items.

1. Establish, maintain, and restore positive relationships (spending individual time with the student; keeping track of special occasions for individual students, and personalizing it; referencing information learned about student strategically during greetings at the door and in conversations; separating the deed from the doer; using 5:1 ratio of positive to negative interactions with students; smiling, etc.)
2. Establishing physiology to learn (stress inoculation, sleep, exercise, and eating well)
3. Positive Behavior Supports (teach, model, cue, reinforce desirable behaviors)

Table 4. Intraclass correlation coefficients of TIERS-FIS ratings by site across time points.

Site	Spring 2016	Fall 2016	Spring 2017	Fall 2017	Spring 2018	Overall Mean
ES 1	.87	.63	.72	.52	.78	.70
ES 2	.72	.72	.43	.69	.57	.63
MS 1	.74	.77	.63	.46	.73	.67
MS 2	.89	.68	.58	.86	.88	.78
HS 1	.74	.77	.63	.55	.60	.66
HS 2	.87	.88	.83	.98	.89	.89
HS 3	.35	.59	.60	.42	.56	.50
HS 4	.67	.72	.61	.68	.55	.65
HS 5	.59	.72	.79	.79	.88	.75
HS 6	.67	.70	.76	.76	.64	.71

Note. ES = elementary school classroom; MS = middle school classroom; HS = high school classroom.

and .74 are considered good, and greater than .75 are considered excellent (Cicchetti, 1994). The mean ICC values for all classrooms range from .50 to .89, showing acceptable to high agreement between raters on reported levels of implementation of the components of TIERS; agreement between raters was excellent in 3 of the classrooms (MS 2, HS 2, and HS5), good in 6 of the classrooms (ES 2, MS 1, HS 1, HS 2, HS 4, and HS 6), and fair in 1 of the classrooms (HS 3).

Procedures

Data collection

Participants received brief verbal instructions for the TIERS-FIS as a part of their broader implementation training and were sent an e-mail invitation with written instructions to individually complete it via an online survey software platform (i.e., SurveyMonkey) at five different time points: spring 2016, fall 2016, spring 2017, fall 2017, and spring 2018. Teachers were offered and provided a $50 voucher for classroom supplies at each time point when all participating staff at their site completed the survey. Respondents that failed to complete the TIERS-FIS within one week of the e-mail invitation received additional e-mail reminders. One hundred percent of the solicited education professionals affiliated with the 10 classrooms completed the survey within two weeks of the initial e-mail invitation across all five administrations.

Analysis

Ratings for each of the TIERS-FIS items were aggregated across the six participants for each of the 10 classrooms. To examine the degree to which intervention components were implemented and determine the program model's feasibility (i.e., whether it was able to be carried out fully as designed), mean scores of all ratings were calculated for each site across all time points. In addition, a count of all intervention components that were fully implemented (as intended by program design) for each site across all time points was conducted. The possible count score ranged from 0 to 14 (maximum number of intervention components). The criterion for an intervention component to be counted as fully implemented is for 80% of ratings to be a 3 (i.e., five of the six participants rate it as having reached "full implementation at fidelity"); this threshold was used to align with common recommendations for assessing agreement and offer sufficient confidence that only interventions implemented fully as intended are counted.

Also, mean scores were calculated for the combined ratings of all time points and rank ordered to examine differences in level of implementation between components (i.e., to identify components that were more or less implemented fully as intended) and a repeated measures analysis of variance was conducted to evaluate whether fidelity changed across time points for each of the sites.

Results

To examine the degree to which the intervention components can be implemented, mean scores of all ratings (i.e.,

all 14 intervention components combined) were calculated for each site across all time points (see Table 5). Mean scores for the elementary, middle, and high school classrooms range from 2.58 to 2.83, 1.83 to 2.74, and 1.61 to 2.76, respectively. The overall mean scores for each site range from 1.87 to 2.74.

For each classroom, the number of intervention components reported by the majority (80%) of participants as having reached full implementation at fidelity was counted for each time point (see Table 6). The range of the count was 3 to 11 (M = 6.17 to 10.5) for the elementary classrooms, 0 to 7 (M = 2.5 to 3.2) for the middle school classrooms, and 0 to 10 (M = .17 to 4.4) for the high school classrooms.

The mean of all ratings collected across time points was computed for each intervention component for each site (see Table 7), which was then used to rank order components from highest to lowest level of implementation (see Table 8). The components with the three highest overall mean scores are numbers 13 (M = 2.63; daily debriefs among staff), 14 (M = 2.56; self-governance meetings) and 7 (M = 2.55; points and levels system). The components with the three lowest overall mean scores are numbers 6 (M = 1.61; good behavior game), 8 (M = 2.22; progressive response system for problem behavior), and 2 (M = 2.25; establish physiology to learn).

To evaluate whether the program model was able to be carried out as designed in self-contained classrooms serving students with EBD, a repeated measures analysis of variance was conducted. In examining the variances of the differences between all possible pairs of within-subject conditions (i.e., mean scores of implementation fidelity for each site across all time points), Mauchly's test of sphericity indicated the

Table 5. Mean scores of ratings for each site across all time points.

Site	Spring 2016	Fall 2016	Spring 2017	Fall 2017	Spring 2018	Overall Mean
ES 1	2.83	2.77	2.82	2.69	2.60	2.74
ES 2	2.71	2.74	2.81	2.64	2.58	2.70
MS 1	2.12	2.07	1.83	2.74	2.19	2.19
MS 2	2.36	1.87	1.94	2.38	2.45	2.20
HS 1	2.14	2.07	1.85	1.61	1.68	1.87
HS 2	2.50	2.30	2.35	2.43	2.29	2.37
HS 3	2.36	2.61	2.73	2.33	2.50	2.50
HS 4	2.65	2.76	2.51	2.49	2.04	2.49
HS 5	2.07	2.69	2.74	2.74	2.48	2.54
HS 6	2.44	1.94	1.70	1.70	1.95	1.95

Table 6. Percentage of intervention components fully implemented across time points by site.

Site	Spring 2016	Fall 2016	Spring 2017	Fall 2017	Spring 2018	Overall Mean
ES 1	79	79	79	79	57	74
ES 2	50	64	71	36	21	49
MS 1	0	7	0	43	7	11
MS 2	36	0	0	29	50	23
HS 1	0	7	0	0	0	1
HS 2	36	21	29	43	29	31
HS 3	0	29	71	14	21	27
HS 4	36	57	21	21	0	27
HS 5	0	43	64	64	29	40
HS 6	7	0	7	7	0	4

Note. Percentage values are rounded to the nearest whole number.

Table 7. Mean scores of ratings for each intervention component by site.

Site	TIERS component													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
ES 1	2.80	2.50	2.87	2.87	2.93	2.03	2.93	2.77	2.90	2.73	2.97	2.17	2.93	3.00
ES 2	2.67	2.63	2.93	2.70	2.93	2.10	2.90	2.73	2.63	2.70	2.87	2.30	2.83	2.83
MS 1	2.57	2.13	2.30	2.10	2.23	1.47	2.30	2.07	2.47	2.13	1.93	1.87	2.47	2.63
MS 2	2.57	2.27	2.47	2.03	2.53	1.13	2.43	2.17	2.37	1.90	2.20	2.53	2.60	1.60
HS 1	2.27	1.77	1.97	1.80	1.80	1.17	2.07	1.70	2.13	1.80	1.50	1.57	2.13	2.50
HS 2	2.97	2.40	2.80	1.97	2.77	1.03	2.30	2.23	2.23	2.10	2.50	2.70	3.00	2.20
HS 3	2.52	2.21	2.40	2.51	2.48	2.03	2.69	2.44	2.49	2.51	2.33	2.50	2.75	2.83
HS 4	2.27	2.37	2.37	2.37	2.47	2.20	2.87	2.03	2.87	2.63	2.57	2.63	2.67	2.57
HS 5	2.62	2.22	2.66	2.61	2.66	1.64	2.72	2.45	2.61	2.51	2.44	2.48	2.80	2.69
HS 6	1.77	2.00	1.67	2.30	1.77	1.27	2.30	1.63	1.97	2.00	1.73	2.07	2.10	2.70
Overall Mean	2.50	2.25	2.44	2.33	2.46	1.61	2.55	2.22	2.47	2.30	2.30	2.28	2.63	2.56

Table 8. Rank order of intervention components (highest to lowest overall mean scores).

Intervention component	Overall mean	SD	Range
13. Daily debriefs among staff	2.63	.31	2.10–3.00
14. Self-governance meetings	2.55	.40	1.60–3.00
7. Points and levels system	2.55	.31	2.07–2.93
1. Establish, maintain, and restore positive Relationships	2.50	.33	1.77–2.97
9. Honors room and outings	2.47	.30	1.97–2.90
5. Proactive management strategies	2.46	.41	1.77–2.93
3. Positive behavior supports	2.44	.40	1.67–2.93
4. Social-emotional Learning Curricula	2.33	.35	1.80–2.87
11. Effective academic instruction	2.30	.47	1.50–2.97
10. Reboot room for reflective time	2.30	.35	1.80–2.73
12. Relentless outreach to parents	2.28	.36	1.57–2.70
2. Establish physiology to learn	2.25	.25	1.77–2.63
8. Progressive response system for problem Behavior	2.22	.39	1.63–2.77
6. Good behavior game	1.61	.45	1.03–2.20

assumption of sphericity to be violated, $\chi2(9) = 67.09$, $p < .001$. Thus, the Greenhouse-Geisser correction was applied ($\varepsilon = .72$). Results indicated ratings did not significantly differ between the first four time points (spring 2016, fall 2016, spring 2017, and fall 2017); however, there was a significant difference between the mean scores of the first and last time points (spring 2016 and spring 2018), $F(2.87, 169.15) = 2.76$, $p = .046$. Post hoc analysis with a Bonferroni adjustment revealed that mean scores significantly decreased between spring 2016 and spring 2018 (.14 (85% CI, .27 to .01) or 14% overall, $p = .026$).

Discussion

Adequately supporting students with EBD in self-contained classrooms is critical to staving off the numerous poor academic, social, emotional, and behavioral outcomes they frequently experience. While schools employ a variety of services to support students with EBD, such services increasingly combine a multitude of evidence-based interventions that are to be delivered concurrently as part of a manualized program. The TIERS program, which was adopted in numerous Southern California schools, is an example of such a program. The current study sought to examine the degree to which the program was implemented (i.e., fidelity) and its practicality as a model for service delivery (i.e., feasibility) in self-contained classrooms serving students with EBD.

Findings indicated that none of the 10 classrooms demonstrated full implementation of all 14 intervention (i.e., Intensified Level 1) components across all time points surveyed. In fact, none of the classrooms demonstrated full implementation at any single time point (range of means = 1.61 to 2.83). This suggests the program was not feasible for these classrooms, as none of them were able to fully carry it out as designed. The best performing classroom was ES 1 (overall mean = 2.74) with the majority (80%) of respondents reporting that an average of 10 to 11 (or 74.28%) intervention components were fully implemented as intended. The other nine classrooms (ES 2, MS 1-2, and HS 1-6) were reported to have implemented intervention components at considerably lower rates (i.e., range of means = 1% to 49%; on average, less than half of the intervention components). In the lowest performing classrooms (MS 1-2, HS 1, and HS 6), the majority of respondents indicated that, on average, less than a quarter of the intervention components were implemented as intended. While surveying multiple individuals attached to each classroom may have helped to buffer against possible bias effects, previous research suggests that the results obtained may be positively inflated as individuals implementing interventions tend to overrate how well they did (Lugtenberg et al., 2011).

Several tenable explanations can be provided to account for these findings that fall far from the intended goal of full implementation. First, it is possible that the individual intervention components of TIERS are not as practicable or effective as the research suggests. Granted there is empirical evidence to support them, the extent to which the findings generalize to real-world classroom settings remains

controversial. Poor fidelity is frequently attributed to poor implementation by education professionals (Ennett et al., 2011; Howlin et al., 2007; Stahmer et al., 2015), but these finding may be more appropriately attributed to an issue of program construction (i.e., failure to account for school contexts; Parsons et al., 2013). To date, most intervention studies on students with EBD have been conducted in clinical or analog settings. Few of these studies describe the use of procedures and their effects within natural contexts (e.g., school classrooms) and information related to generalizability have been mostly limited to anecdotal reports (Gresham & Kern, 2004). The limited evidence to support the generalizability of these interventions raise concerns about feasibility in school settings and thus effectiveness for students with EBD. To examine the relative levels of implementation across intervention components, overall mean scores of ratings for each intervention component were calculated and ranked from highest to lowest. The three lowest ranked (i.e., reportedly least implemented) components include good behavior game, progressive response system for problem behavior, and establish physiology to learn.

Secondly, there exists the possibility that there are shortcomings in the design of the TIERS model. For example, it may be the case that the program simply prescribes too many intervention components. As argued in the implementation science literature, intervention programs that are too complex (i.e., have a high number of intervention components, require multiple service providers, and lack user friendly resources) are less likely to be fully implemented as intended (Borrelli, 2011). With this perspective, a treatment package with 14 intervention components may appear more cumbersome than attainable.

Thirdly, it may be that implementation supports were insufficient in terms of quality and/or amount. When comparing fidelity ratings across time, no significant changes were detected between the first four time points (spring 2016, fall 2016, spring 2017, and fall 2017) but a significant decrease was observed from spring 2016 (overall mean = 2.42 ± .06) to spring 2018 (overall mean = 2.28 ± .06). This was an unanticipated finding given the level of implementation support provided (i.e., training with a program developer at the beginning of each school year, access to reference materials, mid-year consultation and performance feedback from a program developer, and ongoing consultation from a local expert). Although considered evidence-based, there have been several studies that have used such supports and failed to detect improvements in fidelity (Fallon et al., 2018). As argued by Fallon et al. (2018), "it may [have been] critical to further intensify training to support implementation of certain types of interventions" (p. 15). As a complex program involving the concurrent use of numerous procedures, it is conceivable that further intensification of implementation supports may be required to maximally promote fidelity.

Lastly, there are numerous contextual factors that were not captured in this study but could have impacted implementation efforts. As identified in Durlak and DuPre (2008) review of hundreds of studies to summarize findings related to the effects of intervention programs, multiple factors have the power to significantly influence fidelity. These include community-level factors (e.g., policy, funding, and political climate), delivery system factors (e.g., administrative support, availability of resources and technical assistance), and characteristics of providers (e.g., recognition of need for intervention and requisite skills for procedures).

Limitations and Future directions

This study has several noteworthy limitations. First, the sample included only 10 self-contained classrooms located in southern California. The small sample and geographic area from which it came may not be representative of all classrooms implementing TIERS. Secondly, other variables important for understanding implementation were not included in this study. Understanding the intricacies of and barriers to the application of an intervention requires knowledge of factors beyond just adherence (Carroll et al., 2007; Greenhalgh et al., 2004). Although the TIERS-FIS items captured ratings of adherence, moderators that may influence implementation fidelity (e.g., comprehension of the treatment program, facilitation strategies, implementer responsiveness) were not. Thirdly, this study did not include data related to educator or student outcomes. It is possible that intervention components did not have to be fully implemented to achieve desirable outcomes. Similarly, self-report data was not accompanied by any external interrater reliability measures. The presence of an external, unbiased rater would have strengthened findings related to reliability specifically as well as study findings overall. Lastly, the quality of the implementation supports provided (i.e., direct training at the beginning of each school year, written materials to guide implementation, mid-year consultation with a trainer, and bi-weekly meeting with an implementation support specialist) were not evaluated. It is possible that the needs of the implementers for successful implementation of the program were not adequately addressed.

Future research may benefit from expanding the sample and the use of more robust or validated measures to gather data related to adherence, moderators, and outcome variables; assessing the quality and effectiveness of implementation supports provided; and including fidelity data supplied by an external observer that can be used to corroborate the information provided by survey participants.

Conclusion

The research literature generally supports the notion that students with EBD will face lifelong challenges if not provided effective supports to address their unique needs (Kendziora, 2004). Recent advances in our understanding of what works for some students struggling with emotional and behavioral problems have resulted in the recommendations of numerous evidence-based practices in the literature (Tankersley et al., 2004; Walker et al., 2000). While this progress is promising, it must be tempered with the awareness of the challenges of implementation, acknowledgment of our limited knowledge of effective programming, and

recognition of the work still left to be done. The TIERS model debuted as a framework that includes a range of evidence-based interventions for supporting students with EBD in restrictive settings. As a treatment package composed of empirically supported intervention components, there was reason to be optimistic about its potential to help students with EBD. However, there is a lack of evidence in the peer-reviewed literature to indicate that the combination of these components or the TIERS program itself is practicable and effective. To assume that it can be successfully implemented and would be effective because the evidence base for individual components suggests they are feasible and effective would be to make a hasty and unwarranted generalization. The development of an intervention program with a sound theoretical framework is an important step, but it is not the only step required for establishing a model that can be confidently recommended as good practice. The results of this study casts at least some doubt on the feasibility of the TIERS model in separate, self-contained classrooms for students with an EBD. Thus, despite the common practical limitations that often hamper the efforts of researchers to evaluate programs like TIERS (e.g., time, capacity, and funding), further research to identify the barriers that prevent full, or more judicious but effective, implementation of TIERS seems more than warranted if TIERS and other programs like it are to be adopted for implementation in schools.

Declarations

This study complies with all relevant ethical standards.

Disclosure statement

No potential conflict of interest was reported by the authors.

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References

Boardman, A. G., Argüelles, M. E., Vaughn, S., Hughes, M. T., & Klingner, J. (2005). Special education teachers' views of research-based practices. *The Journal of Special Education*, 39(3), 168–180. https://doi.org/10.1177/00224669050390030401

Borrelli, B. (2011). The assessment, monitoring, and enhancement of treatment fidelity in public health clinical trials. *Journal of Public Health Dentistry*, 71(1), S52–S63. https://doi.org/10.1111/j.1752-7325.2011.00233.x

Bowen, D. J., Kreuter, M., Spring, B., Cofta-Woerpel, L., Linnan, L., Weiner, D., Bakken, S., Kaplan, C. P., Squiers, L., Fabrizio, C., & Fernandez, M. (2009). How we design feasibility studies. *American Journal of Preventive Medicine*, 36(5), 452–457. https://doi.org/10.1016/j.amepre.2009.02.002

Bowman-Perrott, L., Davis, H., Vannest, K., Williams, L., Greenwood, C., & Parker, R. (2013). Academic benefits of peer tutoring: A meta-analytic review of single-case research. *School Psychology Review*, 42(1), 39–55. https://doi.org/10.1080/02796015.2013.12087490

Bradley, R., Henderson, K., & Monfore, D. A. M. (2004). A national perspective on children with emotional disorders. *Behavioral Disorders*, 29(3), 211–223. https://doi.org/10.1177/019874290402900301

Bundy, D. A. P., de Silva, N., Horton, S., Jamison, D. T., & Patton, G. C. (2018). *Optimizing education outcomes: High-return investments in school health for increased participation and learning*. World Bank Group.

Cabassa, L. J., & Baumann, A. A. (2013). A two-way street: Bridging implementation science and cultural adaptations of mental health treatments. *Implementation Science: IS*, 8(1), 90. https://doi.org/10.1186/1748-5908-8-90

Carroll, C., Patterson, M., Wood, S., Booth, A., Rick, J., & Balain, S. (2007). A conceptual framework for implementation fidelity. *Implementation Science: IS*, 2(1), 40. https://doi.org/10.1186/1748-5908-2-40

Causton-Theoharis, J., Theoharis, G., Orsati, F., & Cosier, M. (2011). Does self-contained special education deliver on its promises? A critical inquiry into research and practice. *Journal of Special Education Leadership*, 24(2), 61–78.

Christensen, L., Young, K. R., & Marchant, M. (2007). Behavioral intervention planning: Increasing appropriate behavior of a socially withdrawn student. *Education and Treatment of Children*, 30(4), 81–103. https://doi.org/10.1353/etc.2007.0022

Cicchetti, D. V. (1994). Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. *Psychological Assessment*, 6(4), 284–290. https://doi.org/10.1037/1040-3590.6.4.284

Cipriano, C., Barnes, T. N., Bertoli, M. C., Flynn, L. M., & Rivers, S. E. (2016). There's no" I" in team: Building a framework for teacher-paraeducator interactions in self-contained special education classrooms. *The Journal of Classroom Interaction*, 51(2), 4–19.

Conroy, M. A., Sutherland, K. S., Algina, J. J., Wilson, R. E., Martinez, J. R., & Whalon, K. J. (2015). Measuring teacher implementation of the BEST in CLASS intervention program and corollary child outcomes. *Journal of Emotional and Behavioral Disorders*, 23(3), 144–155. https://doi.org/10.1177/1063426614532949

Cook, C. R., & Browning Wright, D. (2009). *RTI in restrictive settings: The TIERS model for students with emotional/behavioral disorders*. LRP Publications.

Cook, C. R., & Browning Wright, D. (2014). *Evidence-based programming for students with emotional/behavioral disorders: The TIERS model* [Handout]. University of Washington.

Duppong Hurley, K. L., Lambert, M. C., & Huscroft D'Angelo, J. N. (2019). Comparing a framework for conceptualizing parental involvement in education between students at risk of emotional and behavioral issues and students without disabilities. *Journal of Emotional and Behavioral Disorders*, 27(2), 67–75. https://doi.org/10.1177/1063426618763112

Durlak, J. A., & DuPre, E. P. (2008). Implementation matters: A review of research on the influence of implementation on program outcomes and the factors affecting implementation. *American Journal of Community Psychology*, 41(3-4), 327–350. https://doi.org/10.1007/s10464-008-9165-0

Durlak, J. A., Weissberg, R. P., & Pachan, M. (2010). A meta-analysis of after-school programs that seek to promote personal and social skills in children and adolescents. *American Journal of Community Psychology*, 45(3-4), 294–309. https://doi.org/10.1007/s10464-010-9300-6

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development*, 82(1), 405–432. https://doi.org/10.1111/j.1467-8624.2010.01564.x

Dusenbury, L., Brannigan, R., Falco, M., & Hansen, W. B. (2003). A review of research on fidelity of implementation: Implications for drug abuse prevention in school settings. *Health Education Research*, 18(2), 237–256. https://doi.org/10.1093/her/18.2.237

Ennett, S. T., Haws, S., Ringwalt, C. L., Vincus, A. A., Hanley, S., Bowling, J. M., & Rohrbach, L. A. (2011). Evidence-based practice in school substance use prevention: Fidelity of implementation under real-world conditions. *Health Education Research*, 26(2), 361–371. https://doi.org/10.1093/her/cyr013

Fallon, L. M., Kurtz, K. D., & Mueller, M. R. (2018). Direct training to improve educators' treatment integrity: A systematic review of single-case design studies. *School Psychology Quarterly*, 33(2), 169–181. https://doi.org/10.1037/spq0000210

Farmer, T. W., Hamm, J. V., Lee, D. L., Sterrett, B., Rizzo, K., & Norwalk, K. (2020). An adaptive, correlated constraints model of classroom management: The Behavioral, Academic, and Social Engagement (BASE) program. In *Handbook of research on emotional and behavioral disorders* (pp. 227–244). Routledge.

Feuerborn, L. L., Wallace, C., & Tyre, A. D. (2013). Gaining staff support for schoolwide positive behavior supports: A guide for teams. *Beyond Behavior*, 22(2), 27–34. https://doi.org/10.1177/107429561302200206

Flynn, L., & Colby, S. R. (2017). Cultivating classroom spaces as homes for learning. *Middle Grades Review*, 3(3), 3.

Forman, S. G., Shapiro, E. S., Codding, R. S., Gonzales, J. E., Reddy, L. A., Rosenfield, S. A., Sanetti, L. M., & Stoiber, K. C. (2013). Implementation science and school psychology. *School Psychology Quarterly*, 28(2), 77–100. https://doi.org/10.1037/spq0000019

Foster, S. L., & Bussman, J. R. (2008). Evidence-based approaches to social skills training with children and adolescents. In *Handbook of evidence-based therapies for children and adolescents* (pp. 409–427). Springer.

Freeman, J., Yell, M. L., Shriner, J. G., & Katsiyannis, A. (2019). Federal policy on improving outcomes for students with emotional and behavioral disorders: Past, present, and future. *Behavioral Disorders*, 44(2), 97–106. https://doi.org/10.1177/0198742918814423

Gagnon, J. C., & Barber, B. R. (2018). Feasibility. In B. B. Fey (Ed.), *The SAGE encyclopedia of educational research, measurement and evaluation* (Vol. 2, p. 668). Sage. https://doi.org/10.4135/9781506326139.n259

Gearing, R. E., El-Bassel, N., Ghesquiere, A., Baldwin, S., Gillies, J., & Ngeow, E. (2011). Major ingredients of fidelity: A review and scientific guide to improving quality of intervention research implementation. *Clinical Psychology Review*, 31(1), 79–88. https://doi.org/10.1016/j.cpr.2010.09.007

Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P., & Kyriakidou, O. (2004). Diffusion of innovations in service organizations: systematic review and recommendations. *The Milbank Quarterly*, 82(4), 581–629. https://doi.org/10.1111/j.0887-378X.2004.00325.x

Gresham, F. M., & Kern, L. (2004). Internalizing behavior problems in children and adolescents. In R. B. Rutherford, M. M. Quinn & S. R. Mathur (Eds.), *Handbook of research in emotional and behavioral disorders* (pp. 262–281). Guilford Press.

Gresham, F. M., Van, M. B., & Cook, C. R. (2006). Social skills training for teaching replacement behaviors: Remediating acquisition deficits in at-risk students. *Behavioral Disorders*, 31(4), 363–377. https://doi.org/10.1177/019874290603100402

Griffith, A. K., Duppong Hurley, K., & Hagaman, J. L. (2009). Treatment integrity of literacy interventions for students with emotional and/or behavioral disorders: A review of literature. *Remedial and Special Education*, 30(4), 245–255. https://doi.org/10.1177/0741932508321013

Hallgren, K. A. (2012). Computing inter-rater reliability for observational data: An overview and tutorial. *Tutorials in Quantitative Methods for Psychology*, 8(1), 23. https://doi.org/10.20982/tqmp.08.1.p023

Herman, K. C., Reinke, W. M., Dong, N., & Bradshaw, C. P. (2022). Can effective classroom behavior management increase student achievement in middle school? Findings from a group randomized trial. *Journal of Educational Psychology*, 114(1), 144–160. https://doi.org/10.1037/edu0000641

Howlin, P., Gordon, R. K., Pasco, G., Wade, A., & Charman, T. (2007). The effectiveness of Picture Exchange Communication System (PECS) training for teachers of children with autism: A pragmatic, group randomised controlled trial. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 48(5), 473–481. https://doi.org/10.1111/j.1469-7610.2006.01707.x

Institute of Education Sciences (IES). (2013). (Ed). *Common guidelines for education research and development*. IES. https://www.nsf.gov/pubs/2013/nsf13126/nsf13126.pdf

Jones, G. (2013). *Educational provision for children with autism and asperger syndrome: Meeting their needs*. Routledge. https://doi.org/10.4324/9780203456699

Jones, V. F., Dohrn, E. A., & Dunn, C. (2004). *Creating effective programs for students with emotional and behavior disorders: Interdisciplinary approaches for adding meaning and hope to behavior change interventions*. Allyn & Bacon.

Kendziora, K. T. (2004). Early Intervention for emotional and behavioral disorders. In R. B. Rutherford, M. M. Quinn & S. R. Mathur (Eds.), *Handbook of research in emotional and behavioral disorders* (pp. 327–351). Guilford Press.

Kratochwill, T. R., Hoagwood, K. E., Kazak, A. E., Weisz, J. R., Hood, K., Vargas, L. A., & Banez, G. A. (2012). Practice-based evidence for children and adolescents: Advancing the research agenda in schools. *School Psychology Review*, 41(2), 215–235. https://doi.org/10.1080/02796015.2012.12087521

Landrum, T. J., Cook, B. G., & Tankersley, M. (2018). Emerging research and issues in behavioral disabilities: incremental progress and introduction to the volume. In *Emerging research and issues in behavioral disabilities*. Emerald Publishing Limited.

Landrum, T. J., Tankersley, M., & Kauffman, J. M. (2003). What is special about special education for students with emotional or behavioral disorders? *The Journal of Special Education*, 37(3), 148–156. https://doi.org/10.1177/00224669030370030401

Lane, K. L., Wehby, J. H., Little, M. A., & Cooley, C. (2005). Academic, social, and behavioral profiles of students with emotional and behavioral disorders educated in self-contained classrooms and self-contained schools: Part I—Are they more alike than different? *Behavioral Disorders*, 30(4), 349–361. https://doi.org/10.1177/019874290503000407

Lorencatto, F., West, R., Christopherson, C., & Michie, S. (2013). Assessing fidelity of delivery of smoking cessation behavioural support in practice. *Implementation Science*, 8(1), 1–10. https://doi.org/10.1186/1748-5908-8-40

Lugtenberg, M., Burgers, J. S., Besters, C. F., Han, D., & Westert, G. P. (2011). Perceived barriers to guideline adherence: A survey among general practitioners. *BMC Family Practice*, 12(1), 98. https://doi.org/10.1186/1471-2296-12-98

Lukowiak, T. (2010). Positive behavioral strategies for students with EBD and needed supports for teachers and paraprofessionals. *Journal of the American Academy of Special Education Professionals*, 40, 52.

Maggin, D. M., Wehby, J. H., & Gilmour, A. F. (2016b). Intensive academic interventions for students with emotional and behavioral disorders: An experimental framework. *Journal of Emotional and Behavioral Disorders*, 24(3), 138–147. https://doi.org/10.1177/1063426616649162

Maggin, D. M., Wehby, J. H., Farmer, T. W., & Brooks, D. S. (2016a). Intensive interventions for students with emotional and behavioral disorders: Issues, theory, and future directions. *Journal of Emotional and Behavioral Disorders*, 24(3), 127–137. https://doi.org/10.1177/1063426616661498

Maynard, B. R., Peters, K. E., Vaughn, M. G., & Sarteschi, C. M. (2013). Fidelity in after-school program intervention research: A systematic review. *Research on Social Work Practice*, 23(6), 613–623. https://doi.org/10.1177/1049731513491150

Miller, I., Crosland, K. A., & Clark, H. B. R. (2014). Behavioral skills training with teachers: Booster training for improved maintenance. *Child & Family Behavior Therapy*, 36(1), 19–32. https://doi.org/10.1080/07317107.2014.878176

Morris, J. R., Dexter, D. D., & Hunter, W. (2021). using guided practice for students with EBD within explicit instruction. *Beyond Behavior*, 30(2), 64–71. https://doi.org/10.1177/10742956211021616

Noell, G. H., Gresham, F. M., & Gansle, K. A. (2002). Does treatment integrity matter? A preliminary investigation of instructional implementation and mathematics performance. *Journal of Behavioral Education*, 11(1), 51–67. https://doi.org/10.1023/A:1014385321849

O'Donnell, C. L. (2008). Defining, conceptualizing, and measuring fidelity of implementation and its relationship to outcomes in K–12 curriculum intervention research. *Review of Educational Research*, 78(1), 33–84. https://doi.org/10.3102/0034654307313793

Ogletree, B. T., Oren, T., & Fischer, M. A. (2007). Examining effective intervention practices for communication impairment in autism spectrum disorder. *Exceptionality*, 15(4), 233–247. https://doi.org/10.1080/09362830701655782

O'Handley, R. D., Olmi, D. J., & Kennedy, A. (2019). Time-out procedures in school settings. In K. C. Radley & E. H. Dart (Eds.), *Handbook of behavioral interventions in schools: Multi-tiered systems of support* (pp. 482–500).Oxford University Press. https://doi.org/10.1093/med-psych/9780190843229.003.0025

Parsons, S., Charman, T., Faulkner, R., Ragan, J., Wallace, S., & Wittemeyer, K. (2013). Commentary – Bridging the research and practice gap in autism: The importance of creating research partnerships with schools. *Autism*, 17(3), 268–280. https://doi.org/10.1177/1362361312472068

Polsgrove, L., & Smith, S. W. (2004). Informed practice of teaching self-control to children with emotional and behavioral disorders. In R.B. Rutherford, M. M. Quinn, & S. R. Mathur (Eds.), *Handbook of research in emotional and behavioral disorders* (pp. 399–425). Guilford Press.

Power, T. J., Blom-Hoffman, J., Clarke, A. T., Riley-Tillman, T. C., Kelleher, C., & Manz, P. H. (2005). Reconceptualizing intervention integrity: a partnership-based framework for linking research with practice. *Psychology in the Schools*, 42(5), 495–507. https://doi.org/10.1002/pits.20087

Pritchard, D., Penney, H., & Mace, F. C. (2018). The ACHIEVE! program: A point and level system for reducing severe problem behavior. *Behavioral Interventions*, 33(1), 41–55. https://doi.org/10.1002/bin.1506

Proctor, E., Silmere, H., Raghavan, R., Hovmand, P., Aarons, G., Bunger, A., Griffey, R., & Hensley, M. (2011). Outcomes for implementation research: conceptual distinctions, measurement challenges, and research agenda.*Administration and Policy in Mental Health*, 38(2), 65–76. https://doi.org/10.1007/s10488-010-0319-7

Reid, R., Gonzalez, J. E., Nordness, P. D., Trout, A., & Epstein, M. H. (2004). A meta-analysis of the academic status of students with emotional/behavioral disturbance. *The Journal of Special Education*, 38(3), 130–143. https://doi.org/10.1177/00224669040380030101

Reinke, W. M., Stormont, M., Herman, K. C., & Newcomer, L. (2014). Using coaching to support teacher implementation of classroom-based interventions. *Journal of Behavioral Education*, 23(1), 150–167. https://doi.org/10.1007/s10864-013-9186-0

Rubow, C. C., Vollmer, T. R., & Joslyn, P. R. (2018). Effects of the good behavior game on student and teacher behavior in an alternative school. *Journal of Applied Behavior Analysis*, 51(2), 382–392. https://doi.org/10.1002/jaba.455

Sabornie, E. J., Evans, C., & Cullinan, D. (2006). Comparing characteristics of high-incidence disability groups: A descriptive review. *Remedial and Special Education*, 27(2), 95–104. https://doi.org/10.1177/07419325060270020701

Sanetti, L. M. H., Fallon, L. M., & Collier-Meek, M. A. (2013). Performance feedback provided by school personnel to increase teachers' intervention implementation: An evaluation of effectiveness, procedural integrity, and feasibility. *Psychology in the Schools*, 50(2), 134–150.https://doi.org/10.1002/pits.21664

Sanetti, L. M., Cook, B. G., & Cook, L. (2021). Treatment fidelity: What it is and why it matters. *Learning Disabilities Research & Practice*, 36(1), 5–11. https://doi.org/10.1111/ldrp.12238

Shepley, C., Lane, J. D., & Ault, M. J. (2019). A review and critical examination of the system of least prompts. *Remedial and Special Education*, 40(5), 313–327. https://doi.org/10.1177/0741932517751213

Smith, S. W., Daunic, A. P., & Taylor, G. G. (2007). Treatment fidelity in applied educational research: Expanding the adoption and application of measures to ensure evidence-based practice. *Education and Treatment of Children*, 30(4), 121–134. https://doi.org/10.1353/etc.2007.0033

Snyder, P. A., Hemmeter, M. L., & Fox, L. (2015). Supporting implementation of evidence-based practices through practice-based coaching. *Topics in Early Childhood Special Education*, 35(3), 133–143. https://doi.org/10.1177/0271121415594925

Sointu, E. T., Savolainen, H., Lappalainen, K., & Lambert, M. C. (2017). Longitudinal associations of student–teacher relationships and behavioural and emotional strengths on academic achievement. *Educational Psychology*, 37(4), 457–467. https://doi.org/10.1080/01443410.2016.1165796

Stahmer, A. C., Collings, N. M., & Palinkas, L. A. (2005). Early intervention practices for children with autism: Descriptions from community providers. *Focus on Autism and Other Developmental Disabilities*, 20(2), 66–79. https://doi.org/10.1177/10883576050200020301

Stahmer, A. C., Reed, S., Lee, E., Reisinger, E. M., Connell, J. E., & Mandell, D. S. (2015). Training teachers to use evidence-based practices for autism: Examining procedural implementation fidelity.*Psychology in the Schools*, 52(2), 181–195. https://doi.org/10.1002/pits.21815

Sterling-Turner, H. E., Watson, T. S., & Moore, J. W. (2002). The effects of direct training and treatment integrity on treatment outcomes in school consultation. *School Psychology Quarterly*, 17(1), 47. https://doi.org/10.1521/scpq.17.1.47.19906

Sutherland, K. S., Conroy, M. A., Algina, J., Ladwig, C., Jessee, G., & Gyure, M. (2018). Reducing child problem behaviors and improving teacher-child interactions and relationships: A randomized controlled trial of BEST in CLASS. *Early Childhood Research Quarterly*, 42, 31–43. https://doi.org/10.1016/j.ecresq.2017.08.001

Sutherland, K. S., McLeod, B. D., Conroy, M. A., & Cox, J. R. (2013). Measuring implementation of evidence-based programs targeting young children at risk for emotional/behavioral disorders: Conceptual issues and recommendations. *Journal of Early Intervention*, 35(2), 129–149. https://doi.org/10.1177/1053815113515025

Tankersley, M., Landrum, T. J., & Cook, B. G. (2004). How research informs practice in the field of emotional and behavioral disorders. In R. B. Rutherford, M. M. Quinn & S. R. Mathur (Eds.), *Handbook of research in emotional and behavioral disorders* (pp. 98–113). Guilford Press.

Tickle-Degnen, L. (2013). Nuts and bolts of conducting feasibility studies. *The American Journal of Occupational Therapy*, 67(2), 171–176. https://doi.org/10.5014/ajot.2013.006270

U.S. Department of Education. (2020). Office of special education and rehabilitative services, & office of special education programs. 42nd Annual Report to Congress on the Implementation of the Individuals with Disabilities Education Act.

Unruh, D. K., & Murray, C. J. (2014). Improving transition outcomes for students with emotional and behavioral disorders. In H. M. Walker & F. M. Gresham (Eds.), *Handbook of evidence-based practices for emotional and behavioral disorders: Applications in schools*. (pp. 410–431). Guilford Press.

Visser, J., Cole, T., & Daniels, H. (2010). Inclusion for the difficult to include. In J. Rix, M. Nind, K. Sheehy, K. Simmons, J. Parry, & R. Kumrai (Eds.), *Equality, participation and inclusion 2: Diverse contexts* (pp. 43–50). Routledge.

Wagner, M. (2014). Longitudinal Outcomes and Post-High School Status of Students with Emotional or Behavioral Disorders. In H. M. Walker & F. M. Gresham (Eds.), *Handbook of research in emotional and behavioral disorders* (pp. 86–103). Guilford Press.

Wagner, M., Kutash, K., Duchnowski, A. J., Epstein, M. H., & Sumi, W. C. (2005). The children and youth we serve: A national picture of the characteristics of students with emotional disturbances receiving special

education. *Journal of Emotional and Behavioral Disorders*, *13*(2), 79–96. https://doi.org/10.1177/10634266050130020201

Walker, H. M., Sprague, J. R., Close, D. W., & Starlin, C. M. (2000). What is right with behavior disorders: Seminal achievements and contributions of the behavior disorders field. *Exceptionality*, *8*(1), 13–28. https://doi.org/10.1207/S15327035EX0801_3

Walton, H., Spector, A., Williamson, M., Tombor, I., & Michie, S. (2020). Developing quality fidelity and engagement measures for complex health interventions.*British Journal of Health Psychology*, *25*(1), 39–60. https://doi.org/10.1111/bjhp.12394

Webster-Stratton, C. (2001). The incredible years: Parents, teachers, and children training series. *Residential Treatment for Children & Youth*, *18*(3), 31–45. https://doi.org/10.1300/J007v18n03_04

Wheeler, J. J., Mayton, M. R., Ton, J., & Reese, J. E. (2014). Evaluating treatment integrity across interventions aimed at social and emotional skill development in learners with emotional and behaviour disorders. *Journal of Research in Special Educational Needs*, *14*(3), 164–169. https://doi.org/10.1111/j.1471-3802.2011.01229.x

White, R., & Renk, K. (2012). Externalizing behavior problems during adolescence: An ecological perspective. *Journal of Child and Family Studies*, *21*(1), 158–171. https://doi.org/10.1007/s10826-011-9459-y

Yell, M. L. (1995). Clyde K. and Sheila K. v. Puyallup School District: The courts, inclusion, and students with behavioral disorders. *Behavioral Disorders*, *20*(3), 179–189. https://doi.org/10.1177/019874299502000308