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REVIEW PAPER

Multi-tiered Systems of Support for School-Based Mental Health: A Systematic Review of Depression Interventions

Prerna G. Arora[1] · Tai A. Collins[2] · Evan H. Dart[3] · Stephanie Hernández[4] · Hallie Fetterman[2] · Beth Doll[5]

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Abstract

Despite the prevalence and negative consequences of depressive disorders among youth, as well as the need for schools to adopt and implement a continuum of mental health services to address depressive disorders, school mental health providers receive very limited guidance in the selection and application of appropriate evidence-based depression prevention and intervention programs for use within a school-based multi-tiered system of support (MTSS). With the goal of supporting school-based mental health providers in the delivery of evidence-based practices targeting depressive symptoms among youth within a MTSS framework, the following study sought to conduct a critical review of the existing school-based prevention and intervention programming for depressive disorders for youth. A systematic, four-stage review was performed from which 119 studies examining 57 unique programs were identified. A review of the studies, including presentation of various participant (e.g., age, grade, ethnicity), study (e.g., control group, randomization), and program (e.g., primary focus, findings, MTSS tier) characteristics, is included. Implementation considerations review and future directions for research are discussed.

Keywords Depression · School · Youth · Intervention · Prevention

Introduction

Depressive disorders, which are characterized by symptoms including depressed mood, irritability, anhedonia, loss of energy, feelings of guilt, and difficulty concentrating (American Psychiatric Association, 2013), are experienced by a large number of youth (Behavioral Health Statistics and Quality, 2015). Specifically, up to 20% of youth will experience a depressive disorder by the age of 18 and 65% will experience less severe depressive symptoms (Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993). Starting in adolescence females are diagnosed with depression at a rate of 2 to 1 compared to males (Galambos, Leadbeater, & Barker, 2004), a disparity which persists through adulthood (Hankin & Abramson, 2001). Childhood depression has numerous negative consequences for youth, including increased risk of drug use, poor academic outcomes, negative interpersonal relationships, and physical health problems (Birmaher et al., 1996; Gould et al., 1998; Kessler et al., 2001). Further, childhood depression places youth at a greater risk of future depressive disorders in adulthood (Rohde, Lewinsohn, & Seeley, 1994). Thus, due to their high prevalence and negative impact on youth functioning, prevention of and treatment for childhood depressive disorders is crucial (Kazdin & Weisz, 1998).

School-Based Prevention and Treatment of Depression

Schools have been underscored as the ideal setting to support the delivery of depression prevention (Werner-Seidler, Perry, Calear, Newby, & Christensen, 2017) and intervention services (Stark, Arora, & Funk, 2011). The delivery of school-based mental health (SBMH) interventions often

✉ Prerna G. Arora
pa2542@tc.columbia.edu

[1] Department of Health and Behavioral Sciences, Columbia University, 525 W. 120th Street, New York, NY 10027, USA

[2] School of Human Services, University of Cincinnati, Cincinnati, OH, USA

[3] Department of Psychology, University of Southern Mississippi, Hattiesburg, MS, USA

[4] Department of Psychology, Pace University, New York, NY, USA

[5] College of Education and Human Services, University of Nebraska-Lincoln, Lincoln, NE, USA

permits increased access to teacher and parents as sources of input and targets of intervention, as well as an opportunity for providers to observe problem behaviors in a naturalistic setting. Further, SBMH services are also believed to reduce typical barriers associated with accessing mental health services (e.g., time, cost; Stephan, Weist, Kataoka, Adelsheim, & Mills, 2007). Several efforts to evaluate the effectiveness of school-based interventions for youth with internalizing symptoms have been undertaken (Stark, Streusand, Arora, & Patel, 2011) and many have stressed the role of SBMH providers (e.g., school psychologists, school social workers) in preventing and addressing depressive symptoms among youth (Herman, Merrell, Reinke, & Tucker, 2004; Lyon, Jacobs, Briggs, Cheng, & Wang, 2014). However, despite the prevalence and negative consequences of depressive disorders, the delivery of school-based interventions for depressive disorders has lagged behind those for others disorders (i.e., externalizing disorders; McIntosh, Ty, & Miller, 2014). Indeed, students with depressive disorders remain underreferred and underrepresented in SBMH services (Bradshaw, Buckley, & Ialongo, 2008; Kauffman, 2001). Accordingly, researchers and policymakers have stressed the need for schools to adopt and implement a continuum of SBMH services to address depressive disorders among youth (Doll & Cummings, 2008; Stark, Arora, & Funk, 2011; Stark, Streusand, Arora, & Patel, 2011).

Multi-tiered Systems of Support and Depression

A multi-tiered system of support (MTSS), a population-based approach to prevention in schools which draws heavily on public health and prevention science models (Weist, Lever, Bradshaw, & Owens, 2014), involves the delivery of evidence-based services along a continuum (Jimerson, Burns, & VanDerHeyden, 2015). Universal, or Tier 1, services are implemented with the goal of preventing mental health concerns which might serve as a barrier to academic achievement Jimerson et al., 2015). Tier 2, or selective, services are delivered with the goal of remediating students at risk for mental health concerns, while Tier 3, or indicated or intensive, services are implemented with the goal of treating youth with the highest level of mental health need (Jimerson et al., 2015).

A long line of research has provided support for the use of the MTSS framework as a model of service delivery in addressing academic (VanDerHeyden, Witt, & Gilbertson, 2007) and behavioral (Bradshaw et al., 2008) concerns among youth in schools. However, only limited guidance in the application of a MTSS framework for addressing internalizing disorders generally (McIntosh et al., 2014), and depression in particular (Herman et al., 2004), has been available. Initial efforts have sought to address this gap by, for instance, describing multi-tiered models of school-based depression prevention that considered both individual and environmental factors associated with the development of depression, included the school environment as a target of intervention, and highlighted observable outcome measures at the individual and systems levels (Herman et al., 2004). Further, there have been additional attempts to identify universal screening measures to identify youth with internalizing concerns (Eklund, Tanner, Stoll, & Anway,2015; Miller et al., 2015; Stormont, Reinke, Newcomer, Marchese, & Lewis, 2015) and examine universal prevention and targeted prevention programs addressing internalizing disorders (Cook et al., 2015; Dart et al., 2015). However, these efforts are in their infancy and additional support is needed to inform the strategic implementation of practices targeting depression within MTSS framework (Kilgus, Reinke, & Jimerson, 2015).

In particular, limited support exists guiding SBMH providers in selecting the appropriate evidence-based depression prevention and intervention programming for use within the context of a school-based MTSS framework. Specifically, although several reviews of depression prevention (Calear & Christensen, 2010; Carnevale, 2013; Werner-Seidler et al., 2017) and intervention programming (Mychailyszyn, Brodman, Read, & Kendall, 2012; Patel, Stark, Metz & Banneyer, 2014) exist, no studies to our knowledge review the full continuum of evidence-based depression services, including universal, selective, and intensive programs, with a particular focus on their potential application within an MTSS framework. Considering recent research highlighting the challenges faced by SBMH providers in selecting and applying depression prevention and intervention programming in schools (Chafouleas, Kilgus, & Wallach, 2010; Warner & Fox, 2012), further clarification of these programs and their application to a MTSS framework is warranted.

Current Study

With the goal of supporting SBMH providers in the delivery of evidence-based practices targeting depression among youth within a MTSS framework, the following review conducted a critical review of the existing school-based prevention and intervention programming for depressive disorders for youth.

Methods

Initial Search

A systematic, four-stage review was performed. The first stage consisted of a comprehensive search of scholarly databases. Two databases, PsycINFO and Education Resources Information Center (ERIC), representing psychology and

education were selected. Next, search terms were developed collaboratively by the authors based on their expertise and an informal review of the relevant literature bases to represent the concepts of interest in the study. A total of 12 keywords were used in this systematic review in order to target relevant literature. These included three keywords for the target population (i.e., "adolescent*," "child*," and "youth*"), four keywords for internalizing symptoms (i.e., "depress*," "internalizing," "mood," and "suicide*"), four keywords for intervention programming (i.e., "prevention," "intervention," "treatment," and "program,"), and one keyword for setting (i.e., "school*"). The Boolean search modifier "*" was used with certain keywords to identify literature with the same root word and various word endings (e.g., "depress*" would identify articles with the words "depression," "depressed," and "depressive"). The Boolean search operators "AND" and "OR" were used in order to conduct a single search with all the relevant keywords.

The keywords were used to search the abstracts, titles, and subject terms of articles within two databases. The search was restricted to articles published within peer-reviewed journals, written in English and published between the years 1990 and 2017. This initial step yielded 4470 results. Authors reviewed titles and abstracts of these articles to determine whether studies were relevant to the keywords described previously. Next, an ancestral search was performed, whereby all articles that were cited by these relevant articles were reviewed for inclusion in the systematic review. Finally, articles that cited these potentially relevant articles were also reviewed for inclusion in the systematic review. As a result of the initial, ancestral, and citation search, 316 articles were identified.

Inclusion Criteria

The next phase of the systematic review consisted of reviewing this initial pool of 316 articles to determine whether they met specific criteria for inclusion. Articles were only included in the review if they (1) described a prevention or intervention study that (2) targeted or discussed depressive symptoms (3) in school-aged youth ages 6–21 in a (4) US school setting.

All 316 articles were reviewed independently by two coders to establish reliability. Scores for each criterion (i.e., "1" or "0") were compared across two raters using an exact agreement method (Cooper, Heron, & Heward, 2007). That is, an agreement was scored when both raters arrived at the same score for a criterion. Initial agreement across all four criteria was 92.4% for initial search articles and 95.6% for the ancestral and citation search articles. Articles with disagreements between raters were recoded by an author who did not initially code any articles. Any articles that did not meet all four inclusion criteria were dropped from the review. This process reduced the article pool to 119 total articles.

Article Coding

The next stage of the review involved coding to extract information from the 119 articles. Participant characteristics (e.g., age range, grade, ethnicity, socioeconomic status), school characteristics (e.g., type of school, location, school level), and intervention characteristics (e.g., name of program, primary focus of program, content, length and frequency of program sessions, program format) were coded. Information relevant to the particular study was also coded; this included the study interventionist, assessments used to measure depressive symptoms, type of control group, and overall findings (i.e., positive, negative, or mixed). As the goal of the systematic review was to identify and describe existing school-based prevention and intervention programming that addressed depressive symptoms among youth, a narrative description of the study's characteristics and a summary of the effectiveness findings of each program were provided. A meta-analysis was not chosen to be conducted because of the range of different outcomes measured across the different trials; however, posttest effect sizes are calculated for all studies when sufficient data were available. Finally, MTSS tier was coded. Tier 1 programs were defined as those delivered with the goal of preventing emotional and behavioral, including depressive, disorders. Tier 2 programs were defined as programs delivered to youth at risk of emotional and behavioral, including depressive, disorders. Tier 2 programs were considered to be delivered to youth at risk of emotional and behavioral disorders if defined by as such by the study. Finally, Tier 3 programs were coded as programs delivered to youth identified with emotional and behavioral, including depressive, disorders. While Tier 1 programs were often delivered to entire school or class populations, Tier 2 programs were often delivered in small group contexts, and Tier 3 services were more likely to be delivered individually; format of delivery was not used to determine the tier of the program as this determination is occasionally based on resource availability. When one article included programs across multiple tiers, the article was listed within each relevant tier. Articles were coded based on their primary target for intervention; for instance, if an article noted that the intervention was targeted to at risk youth but, other youth were then considered space permitting, the intervention was nonetheless coded as Tier 2. For all categories, missing data were coded as "Unknown/Missing."

For reliability purposes, a portion of articles ($n = 12$; 10%) were coded twice. Inter-rater reliability was calculated using an exact method (Cooper et al., 2007) whereby codes for each variable were compared across raters. An agreement was scored when both raters arrived at the same code.

Initial agreement across the 12 articles was 92.31%. Disagreements were discussed between coders until a consensus was reached. The remainder of the articles were coded by one of these two raters.

Results

Participant and Study Characteristics

The 119 studies identified in the current review included a total of 28,594 participants, with a range of 0–5894 ($M = 240.3$) participants per study. Two studies described the development of programs in detail without providing effectiveness data. One study was listed in two tiers.

Grade

With regard to grade of participants, the majority of studies (65; 54.6%) included students in grades 6–8. High school students (grades 9–12) were included in 51 (42.8%) studies, while elementary school students (grades 1–5) and students in pre-Kindergarten and Kindergarten were included in 35 (29.4%) and 4 (3.4%) of studies, respectively. The grade of participants was inferred for 13 studies in which participants' age was included; however, four studies (3.4%) did not include sufficient information to determine students' grades.

Ethnicity

Most studies included White participants (67; 56.3%), African–American participants (65; 54.6%), and/or Hispanic/Latino participants (61; 51.3%). Asian American students were included in 40 studies (33.6%), and Native American participants were included in 23 studies (19.3%). Participants of multi-ethnic identities or other ethnicities were included in 54 (45.4%) of studies. Finally, 21 studies (17.6%) did not provide sufficient information to determine participants' ethnicity, as many studies reported the percentage of 'minority' participants without delineation.

Socioeconomic Status (SES)

Most of the studies (68; 57.1%) did not report sufficient SES data, as many studies did not report SES at all and some reported SES data for only some participants. When SES data were reported, the distribution of studies was as follows: low SES (50; 42%); middle SES (34; 28.5%); and high SES (8; 6.7%).

Type of School

Similarly, 77 studies (64.7%) did not report whether the participating school(s) were public or private. Public schools were included in 37 studies (31.1%), while four studies (3.4%) included private schools and two studies (1.6%) were conducted in charter schools.

Location

Forty-three studies (36.1%) were conducted in urban areas, while 18 studies (15.1%) were in suburban areas and 15 studies (12.6%) were conducted in rural areas. Insufficient data with regard to location were provided in 47 studies (39.5%).

Study Design

Many of the studies included a pre/post design (55; 46.2%) or a pre/post design with follow-up (56; 47.1%). Two studies (1.7%) included data collection before intervention and a follow-up probe without immediate post-intervention data, and four studies (3.4%) included a follow-up probe sometime after intervention without any pre- or immediate post-intervention data. As discussed previously, two studies (1.7%) discussed the development of a program targeting depressive symptoms.

Control Group

With regard to the methods used in the included studies, 49 studies (41.2%) included an active control group, 41 studies (34.5%) included a wait-list control group, and 35 studies (29.4%) did not use a control group.

Tier 1 Programs

Programs identified as Tier 1 were implemented with entire school or class populations with the goal of preventing emotional and behavioral, including depressive, disorders. As such, the following sections include data on a total of 30 studies (25.2%) that discussed Tier 1 programs. Eighteen unique programs were included in these 30 studies. (See Table 1 for a review of Tier 1 studies.)

Primary Focus

Although some Tier 1 studies (8; 26.7% of Tier 1 studies) included programs focused primarily on depressive symptoms, many of the Tier 1 studies focused primarily on other symptoms or disorders while also measuring depressive symptomology. Specifically, seven studies (23.3%) focused primarily on internalizing and/or externalizing behaviors broadly defined, three studies (10%) focused primarily on

Table 1 Tier 1

References	*N*	Age range (years)	Program	Primary interventionist	Primary focus	Content	Length/frequency	Findings	Posttest effect size
Britton et al. (2014)	101	11–12	–	PP	INT + EXT	Mind	Daily, 3–12-min sessions for 6 weeks	+	0.20
Carter et al. (2017)	111	7–10	Urban initiatives work to play	PP	INT + EXT	Other (physical activity)	3, 80-min sessions/week for 24 weeks	+	NA
Chaplin et al. (2006)	208	11–14	PRP	Researcher + PP	DD	CBT	12 weekly, 1.5-h sessions	Mixed	.80
Clarke et al. (1993)	Study 1: 622 Study 2: 380	NR	– –	PP	DD	Study 1: Psychoed Study 2: BT + Psychoed	Study 1: 3, 50-min sessions over 3 consecutive days Study 2: 5, 50-min sessions over 5 consecutive days	Mixed	Study 1: 0.31 Study 2: 0.15
Connell and Dishion (2017)	998	11–17	Family Resource Center	MHP + other	DD	Other (family)	FRC: 6 lessons, FCU: brief, 3 sessions	Mixed	NA
Cutuli et al. (2006)	718	NR	PRP	MHP + Grad + PP	DD	CBT	12 weekly sessions, 1.5 h each	Mixed	0.28
DiPerna et al. (2015)	432	7–8	SSIS-CIP	PP	SS	SS	30, 20–25-min lessons	+	0.13
Freres et al. (2002)	NR	NR	PRP	Grad	DD	CBT	12 sessions	+	NA
Gillham et al. (2007)	697	NR	PRP	Grad + PP	DD	CBT	12 weekly, 90-min sessions	Mixed	0.09
Hains (1992)	6	15–17	SIT	Grad + researcher	AD + DD	CBT	15, 40-min sessions twice weekly	–	0.44
Hains (1994)	19	NR	–	Grad + researcher	Stress	CBT	2, 40-min group sessions + 6, 30-min ind sessions	+	1.07
Hains and Ellmann (1994)	21	NR	SIT	MHP + Grad	Stress	CBT	13, 50-min sessions	+	2.13
Han et al. (2005)	149	4–5	Pre-K RECAP	PP	INT + EXT	CBT + SS	2–3 times/week	–	0.12
Horowitz et al. (2007)	380	NR	IPT-AST	Grad + other	DD	IPT	8, 90-min weekly sessions	+	0.26
Hoying and Melnyk (2016)	31	11–13	COPE	Researcher	Weight + mental health	CBT	15, 50-min weekly sessions	+	0.22
Hoying et al. (2016)	102	13–14	COPE	PP	Weight + mental health	CBT	15, 50-min weekly sessions	+	0.16

Table 1 (continued)

References	*N*	Age range (years)	Program	Primary interventionist	Primary focus	Content	Length/frequency	Findings	Posttest effect size
Jones et al. (2010)	942	NR	4Rs	PP	SEL	Other (SEL + literacy)	21–35 lessons (avg.: 1 lesson/week, 40 min) for the school year + 25 h of pd for teachers	+	0.24
Jones et al. (2011)	1,184	NR	4Rs	Grad + PP	SEL	Other (SEL + literacy)	21–35 lessons each	+	0.22
Kramer et al. (2014)	348	NR	Strong kids	PP	INT	Other (SEL)	10–12, 35–50-min weekly sessions + 2 booster lessons	+	0.09
Lane et al. (2007)	178	NR	SW-PBS	PP	INT + EXT	BT + other	5 beh expectations every other month + 9 character traits monthly + daily reminders, monthly assemblies, & modeling	+	NA
Le and Gobert (2015)	8	15–20	Restoring the Native American Spirit	Community member	Suicide	Mind	4, 55-min sessions/week for 9 weeks	+	NA
Lewis et al. (2013)	1,170	NR	Positive action	PP	Emotional health	Other (SEL)	Grades K-6: 140, 15–20-min lessons 4 days/week Grades 7–8: 70, 20–min lessons 2 days/week	+	0.14
Melnyk et al. (2015)	779	14–16	COPE	PP	Weight + mental health	CBT	20-min weekly session for 15 weeks	+	2.37
Mendelson et al. (2015)	49	12–15	RAP club	MHP + community member	Trauma	CBT + Mind	45-min sessions twice/week for 6 weeks	+	0.10
Miu and Yeager (2015)	599	NR	Brief incremental theory of personality intervention	Researcher + PP	DD	Other	NR	+	NA
Pössel et al. (2013)	518	NR	LARS&LISA	MHP + Grad	DD	CBT	90-min sessions/week for 10 weeks	+	0.52

Table 1 (continued)

References	*N*	Age range (years)	Program	Primary interventionist	Primary focus	Content	Length/frequency	Findings	Posttest effect size
Seifer et al. (2004)	NR	7–8	PATHS	PP	SEL	Other (SEL)	NR	+	0.40
Sibinga et al. (2016)	300	11–14	–	Other	Stress + trauma	Mind	12-week program	+	NA
Smokowski et al. (2016)	5,894	10–14	Positive action	PP	Emotional health	Other (SEL)	82 lessons, 15–20 min	–	NA
Trudeau, Spoth, Randall, Mason, and Shin (2012)	446	NR	ISFT	Other	INT + other (substance use)	Other (family)	6 parent and child skill-building sessions 1-h each + 1-h family session	+	0.09

4Rs Reading, Writing, Respect, and Resolution, *COPE* Creating Opportunities for Personal Empowerment Healthy Lifestyles TEEN (Thinking, Emotions, Exercise, Nutrition), *IPT-AST* Interpersonal Psychotherapy-Adolescent Skills Training, *ISFT* Iowa Strengthening Families Program, *LARS&LISA* Lust An Realistischer Sicht & Leichtigkeit Im Sozialen Alltag (translated as Desire for a Realistic View and Ease in Social Aspects of Everyday Life), *PATHS* Promoting Alternative Thinking Strategies, *PRP* Penn Resiliency Program, *RECAP* Reaching Educators, Children, and Parents, *SIT* Stress Inoculation Training, *SSIS-CIP* Social Skills Improvement System Class wide Intervention Programs, *SW-PBS* Schoolwide Positive Behavior Support, – no program name, *Grad* graduate student, *MHP* Mental Health Practitioner, *PP* Paraprofessional, *DD* depressive disorders, *EXT* externalizing behavior, *INT* internalizing behavior, *BT* behavioral therapy, *CBT* cognitive behavioral therapy, *IPT* interpersonal, *Mind* mindfulness, *Psychoed* psychoeducation, *SEL* Social emotional Learning, *SS* Social Skills, *NR* not reported

obesity or weight management, and one study (3.3%) targeted each suicide and social skills and substance use. Four studies each (13.3%) focused primarily on stress or trauma, while nine studies (30%) focused on mental health or social emotional learning generally.

Content

A variety of approaches were used in Tier 1 studies, including CBT (14; 46.7%), social emotional learning (6; 20%), mindfulness (4; 13.3%), social skills training (3; 10%), and behavioral therapy (2; 6.7%). One study (3.3%) used each psychoeducation, family, and interpersonal therapy. Four studies (13.3%) included other content, including teaching school-wide expectations and physical activity.

Frequency

Regarding the frequency with which the programs were implemented, 13 studies (43.3%) included programs delivered weekly, while nine studies (33.3%) included programs implemented more than once per week. Six studies (20%) provided insufficient data on the frequency of implementation.

Format

With regard to the format of Tier 1 program delivery, 21 studies (70%) included class- or school-wide delivery, while seven studies (23.3%) included programs delivered to groups and two studies (6.7%) included programs delivered to families. One study (3.3%) included a program delivered individually.

Interventionist

In Tier 1 programs, the majority of studies (18; 60%) used school staff (e.g., teachers, nurses) as the primary interventionist. Other studies used researchers and/or graduate students (12; 40%), mental health clinicians (4; 13.3%), and community members or other interventionists (6; 20%).

Timing

With regard to when the Tier 1 programs were implemented, 26 out of 30 studies (86.7%) were conducted during school hours, with four studies (13.3%) including an after-school component. One study (3.3%) did not provide sufficient information to determine the timing of implementation.

Measures

Of the studies evaluating the impact of Tier 1 programs, the Children's Depression Inventory (CDI; Kovacs, 1985) or the Children's Depression Inventory-Short Version (CDI-S; Kovacs, 2003) were used in seven studies (25%), while the Achenbach System of Empirically Based Assessment (ASEBA; Achenbach & Rescoria, 2001) was utilized in five studies (17.8%). The Beck Youth Inventories (BYI; Beck, Beck, & Jolly, 2001) or Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) was used in three studies (10.7%). Other measures used in Tier 1 studies included the Social Skills Improvement Rating Scales (SSIS-RS; Gresham & Elliott, 2008), the Center for Epidemiologic Studies Depression Scale for Children (CES-DC; Radloff, 1977), and the Reynolds Adolescent Depression Scale (RADS; Reynolds, 1987).

Findings

Study findings were coded similar to Sheridan, Welch, and Orme (1996), as each study was coded as having positive findings (i.e., that significant pre-post differences or differences between groups were found), negative findings (i.e., that the intervention was not effective at reducing depressive symptomology), or mixed findings (i.e., that some main effects or interactions were not significant). With regard to Tier 1 studies, 23 out of 30 (76.7%) yielded positive results. Of the 23 studies that yielded positive results, posttest effect sizes ranged from 0.13 to 2.37. Four studies (13.3%) included mixed results. Specifically, Chaplin and colleagues (2006) found significant intervention effects on secondary variables (e.g., hopelessness and attendance) but not on main effects. Further, the results of Clarke, Hawkins, Murphy, and Sheeber (1993) were different for boys and girls, and the effects were not maintained at follow-up; Connell and Dishion (2017) found significant interaction effects, but no significant main effects; and Gilham and colleagues' (2007) results differed by school. Three studies (10%) resulted in nonsignificant intervention effects. Hains (1992) and Han, Catron, Weiss, and Marciel (2005) found nonsignificant effects, while Smokowski and colleagues (2016) found that participants' internalizing scores increased post-intervention.

Tier 2 Interventions

Seventy-one studies (59.6%) were identified as describing Tier 2 interventions, which were delivered with youth identified as at risk of emotional or behavioral, including depressive, disorders. Thirty-six unique programs were included in these 71 studies. (See Table 2 for a review of Tier 2 studies.)

Focus

The majority of Tier 2 interventions primarily focused on depressive disorders (46; 64.8%). Some studies instead focused primarily on trauma (13; 18.3%), suicide (6; 8.4%), anxiety (4; 5.6%), internalizing and/or externalizing behaviors broadly defined (4; 5.6%), stress (3; 4.2%), and mental health broadly defined (3; 4.2%).

Content

Over half of the Tier 2 studies (47; 66.2%) included CBT as a primary component of intervention. Other frequent approaches included mindfulness (5; 7%), interpersonal therapy (2; 2.8%), behavior therapy (2; 2.8%), social skills training (2; 2.8%), and psychoeducation (2; 2.8%). Twenty-five other studies (35.2%) used other intervention approaches, including bibliotherapy, family therapy, positive psychology, and music therapy.

Frequency

The majority of Tier 2 interventions were implemented once per week (43; 60.6%), while other studies included interventions implemented multiple times per week (12; 16.9%). Many studies (16; 22.5%) included insufficient information with regard to frequency, such as specifying the number of total sessions without indicating the number of sessions per week.

Format

The majority of Tier 2 studies included a group intervention format (62; 87.3%). Some studies included individual (28; 39.4%), home/family (12; 16.9%), and class-wide/school-wide components (1; 1.4%).

Interventionist

Tier 2 interventions were frequently implemented by researchers and/or graduate students (34; 47.9%), mental health clinicians (32; 45.1%), and school staff (23; 32.4%). Other interventionists (e.g., peers, paid external staff) were included in nine studies (12.7%).

Timing

Over half of studies (44; 62%) included interventions implemented during school hours, while 20 studies (28.2%) were implemented after school or at home. Fourteen studies (19.7%) did not provide sufficient information with regard to the location of implementation.

Table 2 Tier 2

References	*N*	Age range (years)	Program	Primary interventionist	Primary focus	Content	Length/frequency	Findings	Posttest effect size
Allison and Ferreira (2017)	23	10–14	CBITS	MHP	PTSD/trauma	CBT	10, 50–60-min weekly group sessions; ind student sessions over 4 weeks	+	1.08
Benas et al. (2016)	186	NR	IPT-AST	MHP + Grad	DD	IPT	2 ind pre-group sessions + 8 group + 1 ind mid-group session + 4 ind boosters	+	0.54
Bluth et al. (2016)	27	NR	L2B	Researcher	Stressors	Mind	11 classes	+	1.31
Brière et al. (2014)	378	13–19	–	MHP + PP	DD	CBT + BIB	6 weekly, 1-h sessions	+	0.29
Cardemil et al. (2002)	Study1: 49 Study 2: 103	NR	PRP	Study 1: Grad Study 2: Grad + researcher	DD	CBT	12 weekly, 90-min groups	Mixed	1.01
Cardemil et al. (2007)	Study 1: 49 Study 2: 103	NR	PRP	Study 1: Grad Study 2: Grad + researcher	DD	CBT	12 weekly, 90-min groups	Mixed	NA
Cheney et al. (2009)	207	NR	CCE	PP	EXT + SS + other (academic)	Other	Dependent on intervention level	+	0.21
Clarke et al. (1995)	150	NR	Coping with Stress Course	MHP	DD	CT	3, 45-min sessions/week for 5 weeks	+	0.60
Connell and Dishion (2008)	106	NR	ATP; FRC; FCU	MHP + other	DD	Other (Family)	FRC: 6 in-class lessons; FCU: brief, 3 session intervention; ATP parent: 12 sessions	+	1.35
Connell and Dishion (2017)	998	11–17	FCU	MHP + other	DD	Other (Family)	FRC: 6 lessons, FCU: brief, 3 sessions	Mixed	NA
Cook et al. (2015)	5	NR	CCMP	MHP + PP	INT	Other	2, 40-min sessions 2 days CCMP: 2, 5–10-min sessions 2x/week for 3 weeks	+	NA
Cutuli et al. (2013)	697	NR	PRP	Grad + PP	INT + EXT	CBT	12 weekly session	+	NA
DeLucia-Waack and Gellman (2007)	134	5–10	–	PP	AD + DD	Other (Music Therapy)	8 weekly, 45-min sessions	–	0.09
DeRosier and Marcus (2005)	187	8–9	S.S. GRIN	PP	SS	CBT + SS	8 weekly, 50–60-min sessions	+	0.22
Duong, Cruz, et al. (2016)	120	12–14	PTA	MHP	DD	CBT	12 weekly, 50-min sessions + 2 home Visits + 2 Parent workshops	+	0.36
Duong, Kelly, et al. (2016)	120	NR	PTA	MHP	DD	CBT	12 weekly, 50-min sessions + 2 home Visits + 2 Parent workshops	+	NA

Table 2 (continued)

References	*N*	Age range (years)	Program	Primary interventionist	Primary focus	Content	Length/frequency	Findings	Posttest effect size
Eggert et al. (1995)	307	NR	PGC	PP	Suicide	Other	Daily, 55-min periods PGC I: 5 months or 90 class days; PGC II: 10 months or 180 class days	+	0.31
Eggert et al. (2002)	341	14–19	C-CARE; CAST	MHP + PP	DD + suicide	Other	C-CARE protocol: 4 h; CAST: 12 twice weekly, 1-h sessions	+	NA
Ellis et al. (2013)	30	11–15	Project SHIFA	MHP + Grad	DD + PTSD/ trauma	Other	Weekly groups for 9 months	+	NA
Frank et al. (2014)	49	NR	TLS	PP	Mental health	Mind	30-min sessions 3–4 days/ week	+	0.32
Fung et al. (2016)	19	12–14	L2B	Grad	DD	Mind	12 weekly, 60-min sessions	+	0.49
Garcia et al. (2010)	21	15–21	Project Wings	MHP + researcher + PP	Stress management/ coping	CBT	14 weekly sessions, 2 h each	+	NA
Garcia et al. (2013)	42	14–16	Project Wings	PP + other	Stress management/ coping	CBT	16, 3-h weekly group sessions + booster session	+	0.10
Gillham et al. (1995)	118	10–13	PRP	Grad	DD	CBT	12 weekly sessions, 1.5 h each	+	0.33
Gillham et al. (2006)	44	NR	PRP-CA; PRP-P	Researcher + research assistants	DD + AD	CBT	PRP-CA: 8 weekly, 90-min sessions; PRP-P: 6, 90-min sessions	+	0.38
Gillham et al. (2012)	408	10–15	PRP-A	PP	DD	CBT	10–12 weekly 90-min sessions + 6 group booster sessions	Mixed	0.20
Goldman et al. (2015)	386	NR	STEP	Other	ADHD/OD/CD + DD	CBT	8.32 avg. sessions	+	2.05
Goodkind et al. (2010)	24	NR	CBITS	MHP + PP	PTSD/ trauma	CBT	10 weekly meetings	+	0.36
Graham et al. (2017)	112	8–17	–	MHP	PTSD/ trauma	CBT	Weekly, 55-min ind sessions		0.29
Gudiño et al. (2016)	46	11–16	STAIR-A	Grad	PTSD/ trauma	CBT	16 weekly sessions	+	0.58
Hansel et al. (2010)	115	NR	–	MHP	PTSD/ trauma	CBT	55-min weekly sessions	+	0.40
Hendricks et al. (1999)	19	14–15	–	MHP	DD	Other (music therapy)	8 weeks	+	NA
Hooven et al. (2010)	530	NR	Promoting CARE	Other	Suicide	CBT	NR	+	NA
Hunter et al. (2014)	4	9–11	CICO	Grad	INT	BT	Throughout the day	+	1.60

Table 2 (continued)

References	*N*	Age range (years)	Program	Primary interventionist	Primary focus	Content	Length/frequency	Findings	Posttest effect size
Jaycox et al. (1994)	149	10–13	PRP	Grad	DD	CBT	12 weekly sessions, 1.5 h each	+	0.34
Kahn et al. (1990)	68	10–14	–	MHP	DD	CBT + BT	CWD/Relax: 12, 60-min sessions across 6–8 weeks; Self-Modeling: 2/week 10–12-min ind sessions for 6–8 weeks	+	2.24
Kataoka et al. (2003)	198	NR	MHIP	MHP	PTSD/ trauma	CBT	8 group sessions + 4 (optional) 2-h family group sessions	+	0.41
La Greca et al. (2016)	14	14–18	UTalk	Grad	AD + DD	INT	3 ind + 10, 90-min weekly group sessions	+	0.47
Lamb et al. (1998)	41	14–19	–	PP	DD	CBT	8 weekly sessions	+	NA
Langley et al. (2015)	74	NR	Bounce back	MHP	PTSD/ trauma	CBT	10, 50–60-min group sessions + 2–3, 30–50-min ind sessions + 1–3 parent ed sessions	Mixed	0.65
Listug-Lunde et al. (2013)	16	11–14	–	MHP + Grad	DD	CBT	13 twice weekly, 35–40-min sessions + 2 booster sessions	+	1.25
Marchant et al. (2007)	3	7–11	–	Researcher	DD	CBT	3 sessions	+	NA
McCarty et al. (2010)	67	NR	PTA	Grad	DD	CBT + other (family)	12, weekly school sessions + 2 home visits + 2 parent workshops	–	0.02
McCarty et al., (2013)	120	11–15	PTA	Grad + researcher	DD	CBT	12 weekly, 50-min groups + 2 home visits + 2 parent workshops	+	0.28
McNaughton et al. (2015)	53 dyads	9–14	Comunicación familiar	MHP + PP	Mental health	Other (Communication and Skill Building)	6, 2-h sessions	+	0.29
Melnyk et al. (2014)	16	14–17	COPE	PP	AD + DD	CBT	7 weekly, 50-min sessions	+	0.56
Michael et al. (2016)	20	12–16	SEED	MHP + Clinician Trainees	DD	CBT + Other	9, 45-min sessions over 2–3 months	+	0.64
Morsette et al. (2009)	7	11–12	CBITS	Other	PTSD/ trauma	CBT	10, 60-min sessions + up to 3 ind sessions + 2 parent sessions + teacher session	+	1.12
Morsette et al. (2012)	43	10–15	CBITS	PP	PTSD/ trauma	CBT	10 sessions	+	0.23

Table 2 (continued)

References	*N*	Age range (years)	Program	Primary interventionist	Primary focus	Content	Length/frequency	Findings	Posttest effect size
Müller et al. (2015)	631	13–19	–	MHP + researcher + PP	DD	CBT + BIB	CB/Supportive Groups: 6 weekly, 1-h sessions; Bib: 1 reading	–	0.36
Noël et al. (2013)	32	13–15	Talk 'n' Time	Peer	DD	CBT	12 weekly, 90-min sessions	+	0.86
Puskar et al. (2003)	89	14–18	TKC	PP	DD + coping skills	CBT	10 weekly, 45-min group sessions	+	1.43
Randell et al. (2001)	341	14–19	C-CARE; CAST	PP	DD + suicide	Other	C-CARE: 4 h; CAST: 12, 1-h sessions twice weekly	+	0.32
Rohde et al. (2012)	341	14–19	–	Grad	DD	CBT + BIB	CB/Supportive Groups: 6 weekly, 1-h sessions; Bib: 1 reading	Mixed	NA
Rohde et al. (2014)	378	13–19	–	MHP + PP	DD	CBT + BIB	CB Group: 6 weekly, 1-h sessions; Bib:1 reading	Mixed	0.29
Rohde et al. (2015)	378	13–19	–	MHP + PP	DD	CBT + BIB	CB Group: 6 weekly, 1-h sessions; Bib: 1 reading	Mixed	0.30
Roth et al. (2017)	42	11–13	PPI	Researcher + Grad	Well-being + INT + EXT	Other (Positive Psychology)	10 weekly, 50-min sessions + 2 fu sessions	–	0.37
Ruffolo and Fischer (2009)	60	13–18	–	MHP	DD	CBT	9 weekly, 45- min sessions	Mixed	NA
Salloum and Overstreet (2012)	70	6–12	GTI	MHP + Grad + researcher	PTSD/ trauma	Other	11 weekly, 1-h sessions (10 group, 1 ind)	+	1.11
Santiago et al. (2015)	82	10–14	CBITS + Family	MHP	PTSD/ trauma	CBT	10, 1-h group sessions + 3 ind sessions + 1–2 group ed parent meetings	+	0.65
Stark et al. (1990)	N/A	N/A	–	MHP	DD	CBT	26 sessions, twice weekly	N/A	NA
Stein et al. (2003)	126	NR	CBITS	MHP	PTSD/ trauma	CBT	10 weekly sessions +3 ind sessions	+	0.65
Stice et al. (2007	225	15–22	–	Grad	DD	CBT	4 weekly, 1-h sessions	+	NA
Stice et al. (2008)	341	14–19	–	Grad	DD	CBT	CB/Supportive: 6 weekly, 1-h sessions; Bib: 1 reading	+	0.47
Stice, Rohde, Gau et al. (2010)	341	14–19	–	Grad	DD	CBT	CB/Supportive: 6 weekly, 1-h sessions; Bib: 1 reading	+	0.63
Stice, Rohde, Seeley, et al. (2010)	341	14–19	–	Grad	DD	CBT	CB/Supportive Groups: 6 weekly, 1-h; Bib: 1 reading	Mixed	0.33
Thompson et al. (2000)	106	NR	PGC	PP	DD + suicide	Other	55-min daily for 18 weeks (1 semester) w/option of additional 18 weeks	+	NA

Table 2 (continued)

References	*N*	Age range (years)	Program	Primary interventionist	Primary focus	Content	Length/frequency	Findings	Posttest effect size
Thompson et al. (2001)	460	NR	C-CARE; CAST	PP	DD + suicide	Other	C-CARE protocol: 4 h; CAST: 12, 1-h sessions twice weekly	+	NA
Weiss et al. (2003)	93	NR	RECAP	MHP + Grad + PP	INT + EXT	CBT + SS	1-year: ind student sessions, small group sessions, classroom groups w/peer groups	+	0.18
Weisz et al. (1997)	48	NR	PASCET	Grad	DD	CBT	8 sessions, 50-min each	+	1.49
Zubernis et al. (1999)	59	10–13	Depression prevention program for children	Grad	DD	CBT	12 weekly sessions, 1.5 hrs each	+	0.25

ATP Adolescent Transitions Program, *CAST* Coping and Support Training, *CBITS* Cognitive Behavioral Intervention for Trauma in Schools, *CCE* Check, Connect, and Expect, *C-CARE* Counselors CARE, *CCMP* Courage and Confidence Mentor Program, *CICO* Check In/Check Out, *COPE* Creating Opportunities for Personal Empowerment Healthy Lifestyles, *FCU* Family Check-Up, *FRC* Family Resource Center, *GTI* Grief and Trauma Intervention, *IPT-AST* Interpersonal Psychotherapy-Adolescent Skills Training, *L2B* Learning to BREATHE, *MHIP* Mental Health for Immigrants Program, *PASCET* Primary and Secondary Control Enhancement Training, *PGC* Personal Growth Class, *PPI* Positive Psychology Intervention, *PRP* Penn Resiliency Program, *PRP*-A Penn Resiliency program for Adolescents, *PRP-CA* Penn Resiliency Program for Children and Adolescents, *PRP-P* Penn Resiliency Program for Parents, *PTA* Positive Thoughts and Actions, *Project SHIFA* Supporting the Health of Immigrant Families and Adolescents, *RECAP* Reaching Educators, Children, and Parents, *SEED* Student Emotional and Educational Development, *SIT* Stress Inoculation Training, *S.S. GRIN* Social Skills Group Intervention, *STAIR-A* Skills Training in Affective and Interpersonal Regulation for Adolescents, *STEP* School Therapeutic Enhancement Program, *TKC* Teaching Kids to Cope, *TLS* Transformative Life Skills, – no program name, *Grad* Graduate student, *MHP* Mental Health Practitioner, *PP* Paraprofessional, *DD* Depressive Disorders, *EXT* externalizing behavior, *INT* internalizing behavior, *BT* behavioral therapy, *CBT* cognitive behavioral therapy, *IPT* interpersonal, *Mind* mindfulness, *SEL* Social-emotional Learning, *SS* Social Skills, *NR* not reported

Measures

The CDI (Kovacs, 1985) and CDI-S (Kovacs, 2003) were most often used as an outcome measure for Tier 2 interventions (24; 33.8%), followed by the CES-D (Radloff, 1977) (11; 15.5%), the Kiddie Schedule for Affective Disorders and Schizophrenia (K-SADS; Puig-Antich & Chambers, 1983) (9; 12.7%), the BDI or BYI-D (Beck et al., 1961) (8; 11.3%), the Mood and Feelings Questionnaire (MFQ; Angold, Costello, Pickles, & Winder, 1987) (7; 9.9%) and the RADS (Reynolds, 1987) (4; 5.6%). Other measures included the ASEBA (Achenbach & Rescoria, 2001), the Patient Health Questionnaire (Kroenke, Spitzer, & Williams, 2003), and the Child Depression Rating Scale-Revised (CDRS-R; Mayes, Bernstein, Haley, Kennard, & Emslie, 2010).

Findings

Fifty-five out of 71 (77.5%) Tier 2 studies yielded positive results. Of the 55 studies that yielded positive results, posttest effect sizes ranged from 0.10 to 2.24. Four studies (7%) had nonsignificant results and 11 studies (15.5%) were mixed. Studies without positive findings included music therapy (i.e., DeLucia-Waack & Gellman, 2007), bibliotherapy (i.e., Müller, Rohde, Gau, & Stice, 2015), and positive psychology (i.e., Roth, Suldo, & Ferron, 2017) as the primary approach. Some of the studies with mixed results demonstrated positive effects immediately post-intervention that were not maintained at follow-up (e.g., Gillham et al., 2012; Ruffolo & Fischer, 2009). As discussed previously, one of the studies (Stark et al., 1990) discussed the development of a Tier 2 program.

Tier 3 Interventions

Tier 3 interventions, those implemented with youth identified with emotional or behavioral, including depressive, disorders, were included in 19 studies (16% of total studies). Eleven unique programs were included in these 19 studies. (See Table 3 for a review of Tier 3 studies.)

Focus

Depressive disorders were the primary focus of 15 Tier 3 studies (78.9%), followed by anxiety disorders (8; 42.1%), and Conduct Disorder/ADHD/ODD (3; 15.8%). The remaining studies focused primarily either on trauma (1; 5.3%) and mental health broadly defined (1; 5.3%).

Content

Most of the Tier 3 studies included CBT as a major intervention component (8; 42.1%). Other approaches included interpersonal therapy (6; 31.6%), social skills training (5; 26.3%), behavioral therapy (3; 15.8%), and social emotional learning (1; 5.3%).

Frequency

Many Tier 3 interventions were implemented weekly (10; 52.6%), while one was implemented multiple times per week (5.3%). Eight of the Tier 3 studies (42.1%) did not include sufficient data with regard to frequency.

Format

Individual components were used in 12 Tier 3 studies (63.1%). Group components were used in 13 studies (68.4%) and three studies (15.8%) included family components. One of the Tier 3 studies used class-wide components.

Interventionist

A majority of the Tier 3 studies employed mental health clinicians to implement interventions (13; 68.4%). Researchers and/or graduate students implemented interventions in eight studies (42.1%), followed by staff (2; 10.5%).

Timing

The majority of Tier 3 studies (15; 78.9%) were implemented during school hours, while two studies (10.5%) included after-school components. Four studies (21.1%) did not provide sufficient information to determine the timing of intervention implementation.

Measures

Within Tier 3 studies, the CDI (Kovacs, 1985) or the CDI-S (Kovacs, 2003), as well as the CES-D (Radloff, 1977) were the most common measure used (5 each; 26.3%). Following this were several diagnostic interviews including the Hamilton Depression Rating Scale (Hamilton, 1960) (4; 21.1%) and the K-SADS (Puig-Antich & Chambers, 1983) (4; 21.1%). Other measures used included the BYI (Beck et al., 2001) or the BDI (Beck, et al., 1961) (3; 15.8%), the Diagnostic Interview Schedule for Children (DISC; Shaffer et al., 1996) (3; 15.8%), and the CDRS-R (Mayes et al., 2010) (2; 10.5%). Several measures, including the MFQ short version (Angold et al., 1995), and the RADS (Reynolds, 1987), were each used once in Tier 3 studies (5.3%).

Findings

The majority of Tier 3 studies (15; 78.9%) yielded positive results. Of the 15 studies that yielded positive results,

Table 3 Tier 3

References	*N*	Age range (years)	Program	Primary interventionist	Primary focus	Content	Length/frequency	Findings	Posttest effect size
Brown et al. (2006)	63	8–13	–	Researcher	PTSD/ Trauma	CBT	Classroom: 10 weekly sessions; Ind Intervention: 6, 45-min sessions	+	0.14
Cabiya et al. (2008)	278	8–13	–	Grad	ADHD/CD/ ODD + DD	CBT	12, 50-min sessions	+	0.29
Chu et al. (2009)	5	12–14	GBAT	MHP + Grad	AD + DD	BT	13 weekly 40-min sessions	+	1.04
Chu et al. (2015)	5	12–13	GBAT-B	Grad	AD + DD	BT	14 weekly, 38-min groups	+	NA
Chu et al. (2016)	35	12–14	GBAT	MHP + Grad	AD + DD	BT	12–15 40-min group sessions weekly, + 2, 30–45-min ind meetings	–	0.26
Crisp et al. (2006)	27	NR	Project AMP	MHP + researcher	DD	CBT	12, 45-min weekly sessions	+	NA
Ehrenreich-May and Bilek (2012)	2	7–12	Emotion detectives	MHP	AD	CBT	15, 90-min sessions	Mixed	0.92
Eiraldi et al. (2016)	114	NR	CPP; FRIENDS; PASCET	Grad + PP	DD + AD + EXT	CBT	12 weekly, 45-min sessions	+	NA
Gunlicks-Stoessel et al. (2010)	63	12–18	IPT-A	MHP	DD	IPT	8 weekly, 35-min sessions + 4 sessions	+	0.44
Kam et al. (2004)	133	NR	PATHS	PP	SEL	Other (SEL)	60 lessons	+	0.49
Last et al. (1998)	56	6–17	–	MHP	AD	CBT	12 weekly 60-min sessions	+	0.89
Miller and Cole (1998)	1	14	–	MHP	ADHD/CD/ ODD + DD	SS	Twice weekly 20–30-min sessions for 8 weeks	+	NA
Mufson et al. (2004)	63	12–18	IPT-A	MHP	DD	IPT	12, 35-min sessions	+	0.51
Shirk et al. (2009)	50	14–18	–	MHP	DD	CBT	12 sessions	+	NA

Table 3 (continued)

References	*N*	Age range (years)	Program	Primary interventionist	Primary focus	Content	Length/frequency	Findings	Posttest effect size
Stark, Arora, and Funk, 2011; Stark, Streusand, Arora, and Patel, 2011	N/A	N/A	ACTION	MHP	DD	CBT	20 sessions child + 8 sessions parent	NA	NA
Young et al. (2006)	63	12–18	IPT-A	MHP	AD + DD	IPT	12 sessions	+	1.49
Young et al. (2010)	57	13–17	IPT-AST	Grad + Researcher	DD	IPT	2, 90-min ind, pre-group sessions + 8, 90-min group sessions	Mixed	0.79
Young et al. (2012)	Study 1:41 Study 2: 57	11–17	IPT-AST	Grad + Researcher	AD + DD	IPT	2, 40-min ind pre-group sessions + 8, 90-min group sessions	+	1.20
Young et al. (2016)	186	186	IPT-AST	MHP + Grad	DD	IPT	2, 30–50-min ind, pre-group sessions + 8, 45–90-min group sessions +1 parent session	+	0.52

CPP Coping Power Program, *FRIENDS* Friends for Life, *GBAT* Group Behavioral Activation Therapy (GBAT): The SKILLS Program, *GBAT-B* Group Behavior Activation Therapy for Bullying, *IPT-A* Interpersonal Psychotherapy for Depressed Adolescents, *IPT-AST* Interpersonal Psychotherapy-Adolescent Skills Training, *PASCET* Primary and Secondary Control Enhancement Training, *PATHS* Promoting Alternative Thinking Strategies, *Project AMP* Adolescent Mood Project, – no program name, *Grad* Graduate student, *MHP* Mental Health Practitioner, *PP* Paraprofessional, *AD* anxiety disorders, *DD* depressive disorders, *EXT* externalizing behavior, *BT* behavioral therapy, *CBT* cognitive behavioral therapy, *IPT* interpersonal, *SEL* Social-emotional Learning, *SS* Social Skills, *NR* not reported

posttest effect sizes ranged from 0.14 to 1.49. One study (Chu et al., 2016) found nonsignificant results. Also, one study (Young, Mufson, & Gallop, 2010) found immediate positive results that were not maintained at follow-up, while another study (Ehrenreich-May & Bilek, 2012) presented the preliminary results of an open trial. As noted above, one of the studies (Stark, Arora, & Funk, 2011; Stark, Streusand, Arora, & Patel, 2011) discussed the development of a Tier 3 program.

Discussion

The MTSS framework is an increasingly popular service delivery model for addressing the academic, behavioral, and mental health needs of students in schools; however, guidance in the application of the MTSS framework for addressing youth depression in schools has remained limited. The purpose of this study was to identify and review school-based interventions for depressive symptoms in an attempt to provide researchers and practitioners with

a collection of programs that might be considered when developing a MTSS framework to address the mental health needs of students in schools. One-hundred and nineteen ($n = 119$) studies were identified, and the interventions investigated therein were categorized as either a Tier 1, Tier 2, or Tier 3 strategy to align with the three tiers of service typically provided within an MTSS framework. Overall, there appear to be a large number of interventions that yielded positive results as implemented within schools which may be suitable to address the depressive symptoms of students within an MTSS framework. However, there are some issues that must be discussed to put the current findings within the appropriate context and identify areas in need of further study.

First categorizing interventions into one of the three tiers of service delivery proved challenging. Typically, MTSS frameworks structure services along a continuum of student need and intervention intensity whereby the students exhibiting the most severe difficulties are provided with the most intense interventions (Eagle, Dowd-Eagle, Snyder, & Holtzman, 2015). Similarly, intervention intensity often covaries with the resources required to implement the intervention. Thus, there are numerous variables that characterize interventions at any tier of service and we were faced with the challenge of selecting a primary characteristic by which to make categorical decisions. Although intensity and resource requirement are important, we opted to categorize interventions on the severity of participants' symptoms as treatment decisions within a MTSS are typically made based on student outcomes; however, further complicating this decision was the disconnect between clinical assessment, diagnosis, and treatment of depression and service delivery within a MTSS.

MTSS frameworks are intended to provide services to students prior to special education service delivery and students at any tier are unlikely to have been identified as a student with an emotional disturbance, the Individuals with Disabilities Education Act (IDEA, 2004) classification covering symptoms of depression. This disconnect became apparent when trying to categorize strategies as Tier 2 and Tier 3. Ultimately, we decided to define Tier 2 strategies as those interventions targeting students at risk of emotional or behavioral, including depressive, disorders and Tier 3 strategies as those interventions targeting students with clinical diagnoses of emotional or behavioral, including depressive, disorders; however, in practice, Tier 3 services are likely to be provided to students with no corresponding special education classification. Future research should further investigate what distinction is most appropriate when considering Tier 2 and Tier 3 strategies to address students' mental health.

Effectiveness

Within a MTSS, it is critical that practitioners have a variety of effective strategies at their disposal at each tier of service. As the outcomes of all studies included in this review were categorized as either positive, mixed, or negative, and the magnitude of the effects (i.e., effect sizes) was reviewed, it was possible to gauge the effectiveness of programs at each tier of service. In general, most of the programs investigated at each tier were identified as effective. Of the programs classified as Tier 1, 76.7% were identified as effective, with effect sizes ranging from small (0.13) to very large (2.37). Of the programs classified as Tier 2, 77.5% were identified as effective, with effect sizes ranging from small (0.10) to very large (2.24). Finally, of the programs classified as Tier 3, 78.9% were classified as effective, with effect sizes ranging from small (0.14) to large (1.49). Thus, all three tiers contained effective options for the prevention and treatment of depression in schools. It should be noted that the fewest number of interventions were classified as Tier 3, suggesting there is a relative lack of available intervention options at this tier of service compared to Tier 1 and Tier 2; however, this finding may be an artifact of our classification process, which required Tier 3 interventions to target youth with diagnoses in a school setting. It is possible that Tier 2 interventions may also be effective at Tier 3, but more research is needed to determine the most appropriate distinction between the two.

Participant and Setting Concerns

Although we identified a number of potentially effective interventions in this review, several issues were also identified related to the participants and settings across studies. First, the large majority of participants included in these studies were in middle and high school students, which was not unexpected given the data suggesting that the prevalence of mood disorders increases over the lifespan and is least common in early childhood (Merikangas et al., 2010). Nonetheless, MTSS frameworks emphasize prevention and, as such, efforts to prevent depressive symptoms would likely be best served in the early grades. A meta-analysis conducted by Stice and colleagues (2009) identified age as a predictor of effectiveness in prevention programs for depression in youth. They found that participants below the median age of 13.5 were conferred negligible benefits, while older participants demonstrated moderate response to intervention and hypothesized that the difference was due to the complexity of intervention components (Stice, Shaw, Bohon, Marti, & Rohde, 2009). Issues related to age and intervention effectiveness must be addressed for younger students to benefit, whether that involves modifying complex concepts used in CBT to make them more suitable, and thus more effective,

for young children or investigating alternative modalities that require less complex concepts (e.g., behavior analysis; Kanter, Busch, Weeks, & Landes, 2008).

A second issue revolves around the lack of reporting related to seemingly important participant and setting characteristics. Many studies did not report participant SES, the location or type (i.e., public or private) of school, or the ethnicity of the participants. From a clinical perspective, culturally adapted interventions have been shown to be beneficial for clients' mental health (Griner & Smith, 2006). Logically, mental health interventions in schools should also be adapted to address students' cultural differences. Sue, Zane, Hall, and Berger (2009) identified the method of intervention delivery and intervention content as important factors that should be adapted to a client's culture. Similarly, SES has been linked to a variety of mental health outcomes in children (Bradley & Corwyn, 2002) yet was not often reported in included studies. Without data to support the use of these strategies across a range of student characteristics, it is difficult to determine which interventions may be beneficial for which students. Thus, it is important that researchers collect and report data related to participant characteristics, culture, and socioeconomic status when evaluating interventions for depressive symptoms in order to identify effective strategies. Relatedly, it is critical that the ethnicity of participants be fully reported instead of being combined into categories (e.g., "minorities") given the evidence that individuals from different ethnicities experience different rates of depression (e.g., Sen, 2004).

Implementation Concerns

A discussion of two issues related to implementation of these interventions is warranted. First, although this review sought to identify interventions that could be implemented within the context of a school-based MTSS, the majority of the studies were not couched in this context. Instead, many of the studies simply evaluated the effects of a traditional intervention within a school setting but not within the MTSS service delivery model. As a result, it is unclear how such a framework would function if a particular Tier 1, Tier 2, or Tier 3 intervention were selected and implemented within a MTSS service delivery model. As noted in the review, many of the studies used standardized rating scales as outcome measure. Unfortunately, these rating scales are often lengthy and would make poor progress monitoring assessments, a staple in MTSS frameworks (Eagle et al., 2015). Additionally, decision rules and criteria to move students between tiers of service were also missing from the evaluations. Thus, despite identifying potentially effective interventions, establishing a MTSS for depressive symptoms does not seem as simple as selecting an intervention from each tier. Questions related to the appropriate use of progress monitoring assessments and the application of decision rules and criteria to move students between tiers will need to be answered prior to the integration of such interventions within the MTSS service delivery model.

A second implementation concerns involve the individuals responsible for implementing these interventions. Fortunately, a majority of the Tier 1 studies used school staff members to implement the intervention. This is consistent with Tier 1 interventions in other domains of functioning and highlights the feasibility of these strategies. On the other hand, the Tier 2 and Tier 3 intervention studies almost exclusively used mental health professionals and researchers to implement interventions. One exception was the study by Kam and colleagues (2004), which investigated the use of the PATHS curriculum as a class-wide intervention in special education classrooms. Teachers were trained to implement the curriculum by researchers, providing an example of a Tier 3 strategy that required less involvement from the researchers than typical Tier 2 and Tier 3 strategies. A reliance on clinicians and researchers may be problematic at Tier 2 as up to 15% of students (e.g., 75 students in a school building of 500) may require services. Many schools may not sufficient funds to staff SBMH providers. Moreover, many SBMH providers currently do not have the necessary training to implement such evidence-based programs with fidelity. In such cases, there may not be anyone present at the school who has the requisite training and expertise to implement the Tier 2 or Tier 3 strategy. Thus, in order for a school-based MTSS for depressive symptoms to be viable, it will need to emphasize interventions that do not require highly specialized training, particularly at the Tier 1 and Tier 2 levels.

Implications

Several implications are relevant for practitioners and researchers in light of our findings. First, those wishing to implement a MTSS to address students' depressive symptoms may use this review as a starting place to guide their selection of interventions. As noted above, implementing a service delivery model based upon a MTSS framework is not as simple as selecting an intervention from each tier and putting it into place; however, the interventions identified here should be considered within the larger planning process.

As mentioned earlier, there are several empirical questions that must be addressed before widespread implementation of a MTSS for depressive symptoms is encouraged. Researchers should work to identify which interventions are maximally effective at each tier and for which students and schools. Doing so would require an evaluation of these interventions within the context of a MTSS framework using, for instance, progress monitoring assessments of depression instead of traditional standardized rating scales. Interventions that are

deemed effective in this context may then be suitable for use within an MTSS system. Researchers should also work to develop transition criteria between tiers as well as identifying a progress monitoring assessment that can be administered repeatedly. Currently, we lack sufficient empirical guidance on how to make data-based decisions when addressing depression within a MTSS compared to an outcome like oral reading fluency (e.g., Van Norman & Christ, 2016).

Limitations

There are two limitations of this study to address in order to place the results in the appropriate context. First, the review only dated back until 1990. This date was selected because nearly all of the child research related to internalizing disorder prevention and treatment has been conducted over the past 30 years. Additionally, this cut-off is consistent with other reviews of the SBMH literature (e.g., Carnevale, 2013; Von der Embse, Kilgus, Segool, & Putwain, 2013). Nevertheless, it is possible that we missed older studies that were otherwise appropriate for inclusion in this review. Future research could expand the search for school-based interventions for depression in order to encompass the full breadth of extant literature. A second limitation involved our decision to conduct a systematic review instead of a meta-analysis. Although recent meta-analyses have demonstrated these types of interventions to be effective (e.g., Mychailyszyn et al., 2012), we chose to use a less formal approach to synthesizing their effectiveness. Clearly, as with any empirical synthesis, the findings of our review are skewed in a favorable direction due to publication bias (Rothstein, Sutton, & Borenstein, 2006). The primary purpose of the review was simply to categorize extant interventions based on their appropriateness for use within a MTSS. Furthermore, the content of the interventions at each tier was disparate. For example, Tier 2 interventions included components involving bibliotherapy, family therapy, positive psychology, music therapy, behavioral therapy, and mindfulness. Attempting to quantify the effectiveness of these as Tier 2 strategies would have provided little insight into which particular strategy was most effective. Thus, we chose not to conduct a meta-analysis. However, future research should more fully explore the effectiveness of such interventions, particularly within the context of a MTSS.

Conclusion

In sum, although there appears to be no shortage of school-based interventions for depressive symptoms in students, there are a number of implementation and population issues that have yet to be addressed before these services can be delivered within an MTSS framework. This review should be viewed as a starting place for research and practitioners to continue exploration of a MTSS to meet the mental health needs of students in schools. What might be needed most is an experimental evaluation of a three-tiered service delivery model to address depressive symptoms in students. Furthering our field's knowledge in this area is critical if students are to receive adequate mental health services in schools.

Compliance with Ethical Standards

Conflict of interest All authors declare that they have no conflict of interest.

Human and Animal Rights This article does not contain any studies with human participants or animals performed by any of the authors.

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

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