

# Effectiveness of the Wraparound Process for Children with Emotional and Behavioral Disorders: A Meta-Analysis

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**Abstract** Wraparound is a team-based service planning and coordination process intended to improve outcomes for children and youth with serious emotional and behavioral disorders and support them in their homes, schools, and communities. Given the substantial resources devoted to implementing wraparound, a meta-analysis of outcome studies was conducted to better understand current empirical support for this process. A literature search identified seven studies between 1986 and 2008 that documented the effects of youth receiving wraparound compared to control groups. Mean treatment effects across outcome domains ranged from medium for youth living situation (0.44) to small for mental health outcomes (0.31), overall youth functioning (0.25), school functioning (0.27), and juvenile justice-related outcomes (0.21). The overall mean effect size across studies was 0.33. Interpretation of results was complicated by the lack of consistent documentation of implementation fidelity across studies and conditions, variations in target population and intended outcomes, and methodological concerns. The authors conclude that, though the published wraparound research base is expanding and findings are largely positive, it continues to be in a preliminary state of development. However, there are insufficient data to support calls for wraparound's acceptance or dismissal based on the strength of existing studies.

**Keywords** Wraparound · Meta-analysis · Effectiveness · Community-based · Children and adolescents

## Introduction

The field of children's mental health faces daunting challenges. Estimates indicate that 4.5–6.3 million youth in the United States experience emotional and behavioral disorders severe enough to significantly limit their functioning (Friedman et al. 1999), and the majority receive inadequate or no mental health treatment at all (National Advisory Mental Health Council 2001; New Freedom Commission on Mental Health 2003). One response to these challenges has been to identify and disseminate those interventions with strong empirical evidence for efficacy (Chorpita et al. 2002; Lonigan and Elbert 1998) and make summaries of these evidence-based treatments (EBTs) available to practitioners (Kazdin and Weisz 2003; US Department of Health and Human Services 2008). Despite gains in this area, the vast majority of EBTs are not in widespread use (Weisz 2000). A different response to meeting the needs of youth with serious emotional and behavioral disorders (SEBD) has been to promote *systems of care*. This philosophy provides guidance for establishing a continuum of services and supports for youth and families and procedures for integrating them in an individualized and family driven manner (Manteuffel et al. 2008; Stroul and Friedman 1986). The system of care framework has been widely applied and earned strong support from community members and families, but its evidence base has not kept pace with EBTs (Weisz et al. 1997, 2006).

Recently, there have been calls to capitalize on the strengths of these two movements by ensuring that communities offer EBTs as the specific services within their

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systems of care (Tolan and Dodge 2005; Weisz et al. 2006). Intuitively, joining these two “different worlds of children’s mental health” (Weisz et al. 2006, p. 644) makes sense for achieving better access to treatment and more positive outcomes. One approach that holds promise for achieving this convergence is the wraparound process. Wraparound has been highlighted as a specific method for selecting and implementing EBTs and other services and supports using a process engaging of families and consistent with system of care principles (Weisz et al. 2006).

### The Wraparound Process

Wraparound is a team-based, collaborative process for developing and implementing individualized care plans for youth with SEBD and their families (Burchard et al. 2002; Walker and Bruns 2006b). Introduced in the 1980s, wraparound was offered as an alternative to institutionalization for youth with complex support needs (VanDenBerg 2008). Wraparound provides a flexible process through which any number of traditional and nontraditional services and supports can be identified, implemented, and coordinated. The active ingredients of the wraparound

process have been defined by a set of 10 philosophical principles (see Table 1, Bruns et al. 2008b). Wraparound has been applied across many settings to achieve a broad range of outcomes such as improved mental health, reduced juvenile recidivism rates, more successful permanency outcomes, improved school achievement and attendance, and retention in less restrictive educational settings (Bruns et al. 2008a; Suter and Bruns 2008).

Providing services and supports through the wraparound process has several advantages for families and service providers. The wraparound process encourages practices that address common concerns about EBTs such as they are designed to treat single disorders and thus may have difficulty meeting the more comprehensive needs of youth with severe functional impairment and comorbidity, too prescriptive to be truly individualized, and lacking in flexibility which can interfere with family engagement and building therapeutic relationships. Wraparound’s team-based approach encourages coordination among providers and families that can help identify gaps in treatment and barriers to follow-through while avoiding redundancies. Wraparound’s emphasis on community-based and natural supports provides a mechanism for generalization of skills

**Table 1** The ten principles of the wraparound process

Principle	Description
1. Family voice and choice	Family and youth/child perspectives are intentionally elicited and prioritized during all phases of the wraparound process. Planning is grounded in family members’ perspectives, and the team strives to provide options and choices such that the plan reflects family values and preferences
2. Team based	The wraparound team consists of individuals agreed upon by the family and committed to the family through informal, formal, and community support and service relationships
3. Natural supports	The team actively seeks out and encourages the full participation of team members drawn from family members’ networks of interpersonal and community relationships. The wraparound plan reflects activities and interventions that draw on sources of natural support
4. Collaboration	Team members work cooperatively and share responsibility for developing, implementing, monitoring, and evaluating a single wraparound plan. The plan reflects a blending of team members’ perspectives, mandates, and resources. The plan guides and coordinates each team member’s work toward meeting the team’s goals
5. Community based	The wraparound team implements service and support strategies that take place in the most inclusive, most responsive, most accessible, and least restrictive settings possible and that safely promote child and family integration into home and community life
6. Culturally competent	The wraparound process demonstrates respect for and builds on the values, preferences, beliefs, culture, and identity of the child/youth and family, and their community
7. Individualized	To achieve the goals laid out in the wraparound plan, the team develops and implements a customized set of strategies, supports, and services
8. Strengths based	The wraparound process and the wraparound plan identify, build on, and enhance the capabilities, knowledge, skills, and assets of the child and family, their community, and other team members
9. Unconditional	A wraparound team does not give up on, blame, or reject children, youth, and their families. When faced with challenges or setbacks, the team continues working toward meeting the needs of the youth and family and toward achieving the goals in the wraparound plan until the team reaches agreement that a formal wraparound process is no longer necessary
10. Outcome based	The team ties the goals and strategies of the wraparound plan to observable or measurable indicators of success, monitors progress in terms of these indicators and revises the plan accordingly

*Note:* From “Ten Principles of the Wraparound Process,” by Bruns et al. (2008b), *The Resource Guide to Wraparound*. Reproduced with permission from the authors

learned in treatment. Unlike many EBTs, wraparound is utilized extensively. Given the definition of wraparound and its principles, children's mental health directors in 88% of US states and territories reported having at least one wraparound initiative in their state. Results from this study yielded an estimate of over 100,000 youth participating in nearly 1,000 programs (Bruns et al. 2008a). Wraparound programs have also been developed in Canada, New Zealand, Norway, and other countries (VanDenBerg 2008).

Providers now have access to more detailed information about implementing high-quality wraparound. Until recently, programs wanting to use the wraparound process needed to translate the 10 general principles into specific action steps, find and review descriptions of model wraparound projects (e.g., Goldman and Faw 1999; Stephens et al. 2005), or seek consultation and review manuals by national trainers (Eber 2003; Grealish 2000; VanDenBerg and Grealish 1998). In 2003, national experts and representatives of model sites initiated a collaborative effort to define the core activities of wraparound (Walker and Bruns 2006a). Wraparound was defined as is the application of all 10 principles across a four-phase process that includes (1) engagement and team preparation, (2) plan development, (3) plan implementation, and (4) transition out of the formal wraparound process (Walker et al. 2008). A theory of change (Walker 2008; Walker and Schutte 2004) and descriptions of the necessary system and organizational structures to support wraparound implementation have also been defined (Walker et al. 2003).

### Status of Wraparound's Evidence Base

Despite the enthusiastic adoption and widespread dissemination of the wraparound process, and recent efforts to specify its implementation parameters, the evidence base for wraparound has lagged behind EBTs and other community mental health interventions with a longer track record of process specification such as Multisystemic Therapy (Henggeler et al. 2002) and Multidimensional Treatment Foster Care (Chamberlain 2003). Wraparound's evidence base has alternately been classified as "promising" (Burns et al. 1999; California Department of Social Services 2008), "emerging" (New Freedom Commission on Mental Health 2003), a "best practice" (JJ/SE Shared Agenda 2007), and even as "evidence-based" by state agencies (Oregon Department of Health Services 2008) and children's mental health experts (Stroul 2002). Wraparound outcome studies have been summarized in four narrative reviews (Burchard et al. 2002, 1999; Farmer et al. 2004; Suter and Bruns 2008). Although each successive review included additional outcome studies (the most recent included 36), the overall conclusions were largely the same: studies showed generally positive outcomes for

youth receiving wraparound, some studies did not show positive effects on some or most outcomes, and there were serious concerns regarding the methodologies used in the majority of studies. Most of the studies included only youth receiving wraparound so they could not address the question of whether youth participating in wraparound achieve better outcomes than youth receiving conventional services.

It is critical to evaluate wraparound's evidence base due to questions about the degree of empirical support for wraparound in the face of its continued expansion. To that end, several unique challenges to the evaluation of wraparound must be recognized in order to understand and document the full potential of this process. First, separating the effects of specific services (e.g., EBTs) from the wraparound process is complex and has not been attempted. Second, there is no universally adopted manual for implementing wraparound, which naturally creates variability between programs. Third, wraparound is not synonymous with systems of care, so evidence from systems of care evaluations and research do not directly apply to wraparound. Fourth, wraparound programs typically do not target specific populations or mental health disorders. More often, they serve broad populations of youth experiencing a wide range of complex support needs and comorbid mental health disorders.

Wraparound's potential for improving a variety of outcomes for a broad spectrum of youth in many different settings demonstrates the importance of critically examining the evidence base for wraparound. The current study extends contributions from previous reviews by using meta-analysis to provide the first systematic quantitative review of the controlled wraparound outcome studies. To understand the findings within their methodological and intervention contexts, this review explored three aspects of the included studies: characteristics of the studies themselves (e.g., publication information, study design), information provided about wraparound implementation, and the magnitude of effects across studies and specific outcome domains. Several categorical variables that may account for variation in treatment outcomes were also examined.

## Method

### Selection Criteria

Studies were chosen for this meta-analysis that provided direct comparisons between youth receiving wraparound to those in a control group. A balance was sought to include those studies with strong methodological design without excluding findings from the majority of the literature. As

such, both experimental and quasi-experimental controlled outcome studies were considered in order to capture the “best available evidence” (Petticrew and Roberts 2006, p. 63). To meet this goal, the following selection criteria were chosen.

### Design

The study must have used a control group design. The control condition could involve no treatment, wait-list, or conventional services (i.e., typical services that youth would have received if they were not enrolled in the wraparound program). Treatment versus treatment comparisons were excluded unless one treatment acted as a control for the group receiving wraparound. This choice was made because the goal was to examine the effects of wraparound compared to what services and supports youth typically receive. Due to the small number of experimental group design studies conducted on the wraparound process, quasi-experimental group comparison studies (i.e., those that did not use random assignment) were included in the present review. Single group, pretest–posttest studies were excluded from the present review because they are less methodologically rigorous, and the effect size statistics are more difficult to compare (Lipsey and Wilson 2001).

### Intervention

The team-based planning process used in the study must have been labeled as wraparound or sufficiently described by the authors as sharing the primary principles of wraparound. Interventions that included community-based planning for children with emotional and behavioral disorders (e.g., case management) but did not explicitly incorporate other wraparound principles were excluded. Similarly, systems of care evaluation studies that followed similar principles as wraparound (at the system level) were excluded if the wraparound process was not explicitly used (at the family level). No exclusionary criteria were made regarding the lead agency or program initiating wraparound.

### Participants

The target population of the study was youth (3–21 years) with SEBD and/or significant functional impairment. Evidence of significant functional impairment included those at-risk of (or returning from) out-of-home placements (e.g., psychiatric hospital, residential treatment center, juvenile justice facility, foster care, group home), as this is a common target population for wraparound.

### Outcomes

Because the wraparound process seeks to provide both comprehensive and individualized supports for youth with complex needs, studies have measured its effectiveness using a wide range of outcomes. Recently, Walker (2008) proposed a theory of change for wraparound that included short-term, intermediate, and long-term outcomes. The long-term outcomes from this framework were used to identify four youth-specific outcome domains for the present study: (a) *living situation*—youth living in more stable and less restrictive placements; (b) *mental health*—reduction in emotional and behavioral problems, symptoms, and disorders; (c) *functioning*—improved youth functioning in their homes, schools, and communities; and (d) *assets and resiliency*—improvements in youth strengths and assets. Studies eligible for inclusion in the present review must have measured outcomes in at least one of these broad domains. Studies that measured only process or short-term outcomes (e.g., fidelity, satisfaction with services, service coordination) or outcomes that were not youth-specific (e.g., family functioning, caregiver mental health) were not included. While both are critical for evaluating wraparound, the focus of the current meta-analysis was on whether wraparound demonstrated positive outcomes for youth.

### Timeframe and Language

The study must have been made available between January 1, 1986 and December 31, 2008. This timeframe was chosen because the wraparound process, as it is currently conceptualized, was reported to have begun in 1986 (VanDenBerg 1999). To be accessible to the researchers, the study had to be written in English.

### Literature Search

The goal of the literature search was to identify and screen all studies that met the above selection criteria. Studies for this meta-analysis were selected from a larger narrative review of outcome studies on wraparound (Suter and Bruns 2008), and this process is summarized briefly here. First, earlier narrative reviews of wraparound (Burchard et al. 2002; Burns et al. 1999; Farmer et al. 2004) were examined for outcomes studies that met the selection criteria. Second, electronic databases (Web of Science, PsycINFO, and ERIC) were used to search for the keywords: *wraparound*, *wrap-around*, *individualized services*, and *individualized service plans*. Third, a manual search was conducted of the *Journal of Child and Family Studies*, *Journal of Emotional and Behavioral Disorders*, and the annual research conference proceedings of *A System of Care for Children's*

*Mental Health: Expanding the Research Base* hosted by the University of South Florida, Research and Training Center for Children's Mental Health. These three sources were chosen for a manual literature search because they have been the primary research outlets for wraparound studies.

### Search Outcome

The literature search yielded seven controlled outcome studies of wraparound that met the selection criteria for the present review (Bickman et al. 2003; Bruns et al. 2006a; Carney and Buttell 2003; Clark et al. 1998; Evans et al. 1998b; Hyde et al. 1996; Pullmann et al. 2006). Authors for three studies were contacted to obtain additional data to compute effect sizes for all reported outcomes. Bruns et al. (2006a) provided a manuscript submitted for publication (Rast et al. 2008) along with additional data (e.g., group means and standard deviations). Bickman and Evans provided federal reports for their studies (Bickman 2002; Evans et al. 1998a) that offered a great deal of more detail about outcome analyses.

It is important to note that over 80% of the outcome studies identified in the most recent narrative review (Suter and Bruns 2008) were not included in the present meta-analysis. Noncontrolled outcome studies were excluded, including those using a single group pretest–posttest ( $n = 23$ ) or single case design ( $n = 3$ ). In addition, two comparison studies were excluded because they did not provide comparisons between wraparound and control groups, thus they could not speak to what effects wraparound could achieve compared to no treatment or conventional services. One was a treatment versus treatment study comparing wraparound to Multisystemic Therapy (Stambaugh et al. 2007), which has demonstrated positive findings in several randomized clinical trials (for a review see Curtis et al. 2004). The other was a comparison study in which the only difference between groups was the presence of a small financial incentive for the “wraparound” group (Resendez 2002). Finally, while a description of an ongoing experimental study was included in the latest narrative review (Rast and Vetter 2008), final results were not yet available.

### Coding of Studies

Once studies were identified that met the selection criteria, the lead author reviewed them and assigned codes for several variables to permit comparisons across studies. First, study characteristics were coded, including source of publication, year, and study design. Second, characteristics about the wraparound intervention were coded such as number and characteristics of participants, program

information, format of the intervention, and steps taken to maintain intervention integrity. Third, to examine whether wraparound produced different effects for different types of outcome domains, both authors independently coded study outcomes ( $n = 66$ ) into the four outcome domains described in the selection criteria. Reliability was fairly high between the coders ( $\kappa = .81$ ), and disagreements were resolved by consensus. This process resulted in outcomes coded as measuring living situation ( $n = 8$ ), mental health ( $n = 12$ ), functioning ( $n = 41$ ), and assets and resiliency ( $n = 4$ ). One study outcome was not coded in any domain because it was a combined rating that spanned living situation, mental health, and functioning (the single outcome from Hyde et al. 1996), but it was included in analyses for overall effect sizes. Within the functioning domain, the majority of outcomes were related specifically to functioning in school ( $n = 15$ , e.g., grade point average, attendance, disciplinary actions) or contact with juvenile justice ( $n = 17$ , e.g., arrests, detention, number of charges). Because wraparound has been implemented specifically in school and juvenile justice service systems, two sub-domains of functioning were created.

### Statistical Procedures

#### *Effect Size Reporting*

The standardized mean difference, typically referred to as Cohen's  $d$  (1988), was chosen as the effect size for this meta-analysis. Following convention, positive effect sizes indicate better outcomes for youth receiving wraparound, while negative effect sizes indicate better outcomes for the control group. Effect sizes were calculated or estimated for each outcome measured, then averaged to create a single mean effect size for each outcome domain and an overall mean effect size for each study. In this way, each study contributed only a single effect size for each analysis. If data on outcomes were collected at multiple times during a study, effect sizes were based on those representing the latest follow-up wave.

#### *Effect Size Calculation*

Effect sizes for this meta-analysis were calculated as the difference between wraparound and control group means at posttest divided by the pooled standard deviation. Effect sizes were generated using an effect size program created by Wilson (2004) and presented such that positive values always indicated positive results for youth receiving wraparound relative to youth in control groups. Despite receiving additional data for the Bickman et al. (2003) and Evans et al. (1998b) studies, the summary findings they presented did not permit a direct calculation or estimation

of standardized mean effects, and additional data was not available. To include these studies, effect sizes were imputed by making the conservative assumption that  $p = .05$  for significant group differences. The estimation formulas could then be used to determine the minimum effect size needed to obtain a  $p = .05$  for the study's sample size. All nonsignificant outcomes were imputed with an effect size of zero (see Lipsey and Wilson, p. 70). In recognition of the imprecision inherent in imputing effect sizes, findings are presented with and without the imputed effect sizes.

### Effect Size Adjustments

All effect sizes were adjusted using Hedges' small sample size correction to create unbiased estimates (Hedges and Olkin 1985). In addition, the mean effect size across all studies and mean effects for each outcome domain were calculated by weighting each effect size by the inverse of its variance. This procedure allowed studies with larger sample sizes to have a greater relative influence on these effects than studies with smaller sample sizes. We made no additional effect size adjustments (e.g., weighting by study design) following Lipsey and Wilson's (2001) recommendation to avoid clouding interpretation of effect sizes.

### Homogeneity Analysis

A homogeneity test (Hedges and Olkin 1985) was conducted on the mean effects for the seven wraparound outcome studies. The test was not significant,  $Q(6) = 9.69$ ,  $p = .14$ , suggesting a fixed effects model might be

appropriate. However, a random effects model was chosen due to low power to reject homogeneity with so few studies (Lipsey and Wilson 2001) and for the conceptual reason that these studies demonstrated variability in design, methodology, outcomes, and other study factors likely to influence effect sizes beyond sampling error alone. Homogeneity analyses and random effects models were computed using SPSS macros written by Wilson (2002).

## Results

Given the unique challenges for empirically evaluating the wraparound process (as outlined in the introduction) and that this is the first systematic quantitative review of wraparound, we decided it was critical to first explore characteristics of the studies and how wraparound was implemented across programs to provide a context for understanding the outcomes achieved. To that end, results from this meta-analysis summarized (a) study characteristics including publications and research design, (b) intervention characteristics such as information about the participants and format of wraparound, and (c) study outcomes including overall mean effects and outcome domains. A summary of study and participant characteristics are presented in Table 2.

### Study Characteristics

#### Publication Source

Four of the seven studies presented findings in more than one outlet. The full Rast et al. study (2008) has been

**Table 2** Characteristics of studies included in meta-analysis

Study	Target population	Design	N	Attrition	Mean age (years)	% Female	Posttest (months)	Mean ES
1. Bickman et al. (2003)	Mental health	Nonequivalent comparison group match	111	15%	12.2	42	10	0.05 <sup>b</sup>
2. Carney and Buttell (2003)	Juvenile justice	Randomized control	141	NR	14.8	38	18	0.22
3. Clark et al. (1998)	Child welfare	Randomized control	131	NR	11.5 <sup>a</sup>	40	42	0.11
4. Evans et al. (1998b)	Mental health	Randomized control	42	35%	9.0	10	12	0.20 <sup>b</sup>
5. Hyde et al. (1996)	Mental health	Nonequivalent comparison groups not matched	106	35%	17.3	25	12	0.68
6. Pullmann et al. (2006)	Juvenile justice & mental health	Nonequivalent comparison historical group match	204	NR	15.2	31	26	0.55
7. Rast et al. (2008)	Child welfare	Nonequivalent comparison individually matched	67	25%	11.9	49	18	0.67

*Note:* Positive effect size values indicate larger positive effects for groups receiving wraparound. The mean effect size for each study is the average effect across multiple outcome measures

ES effect size, CI confidence interval, NR not reported

<sup>a</sup> Represents the median age because mean age was not reported

<sup>b</sup> Effect size imputed using Lipsey and Wilson (2001) estimation methods assuming  $p = .05$  for significant outcomes and ES = 0.00 for nonsignificant outcomes

submitted for publication, and preliminary findings were included in two paper presentations (Peterson et al. 2003; Rast et al. 2003) and the published policy paper on wrap-around (Bruns et al. 2006a). Earlier reports of Clark and his colleagues' study (1998) were initially made available in two journal articles (Clark et al. 1996; Clark and Prange 1994) and a conference presentation (Clark et al. 1997), before the final book chapter was published with outcomes based on the longest follow-up. As mentioned previously, Evans and Bickman produced federal reports (Bickman 2002; Evans et al. 1998a) expanding on their published studies (Bickman et al. 2003; Evans et al. 1998b). In addition, Evans published preliminary data about her study in an earlier journal article (Evans et al. 1996). Taken together, the seven primary studies were presented in 16 separate reports, and each study had at least one peer-reviewed journal publication ( $n = 8$ ). Secondary reports were not considered independent studies. Instead, they were used to find additional information (e.g., findings, details about the intervention and participants) to supplement that presented in the primary studies. Except in cases where more detail was necessary, the primary studies are referenced by their most recent reports in the present meta-analysis.

### Design

Following the inclusion criteria, all studies used pretest–posttest control group designs. Three used an experimental design (Carney and Buttell 2003; Clark et al. 1998; Evans et al. 1998b), while the other four were quasi-experimental (Bickman et al. 2003; Hyde et al. 1996; Pullmann et al. 2006; Rast et al. 2008). Thus, a primary design distinction among studies was whether or not participants were randomly assigned to groups. All studies reported that youth in the control groups received conventional services available from similar agencies and service systems as their wrap-around counterparts. For example, youth in Carney and Buttell's study (2003) participated in the juvenile justice wrap-around demonstration program or received conventional services of the juvenile court system. Therefore, all control group participants received services and supports rather than being assigned to a no-treatment or wait-list control.

Ensuring that groups are comparable at baseline is a critical check of internal validity for control group design. The three experimental studies provided the most methodologically rigorous method for creating comparable groups by randomly assigning participants to receive wrap-around or conventional services from the juvenile court system (Carney and Buttell 2003) or foster care (Clark et al. 1998; Evans et al. 1998b). Control groups for the quasi-experimental studies were created by (a) individually matching youth to those receiving

wrap-around on demographic and outcome variables (Rast et al. 2008); (b) identifying historical groups of youth who would have received wrap-around but started services just before the wrap-around programs were in place (Hyde et al. 1996; Pullmann et al. 2006); (c) examining youth who were referred, but not eligible for the wrap-around program (Bickman et al. 2003); and (d) comparing youth in similar circumstances as those who received wrap-around (i.e., returning from an out-of-state residential placement) but were not referred to wrap-around program (Hyde et al. 1996).

Four of the studies noted that no statistical differences were found between groups at baseline on demographics (age, race, and gender) and outcome measures (Carney and Buttell 2003; Evans et al. 1998b; Pullmann et al. 2006; Rast et al. 2008). Of the remaining studies, one reported no differences on outcome measures but did not assess demographic variables (Bickman et al. 2003), and two did not report assessing baseline differences at all (Clark et al. 1998; Hyde et al. 1996). Hyde and her colleagues made a point to caution that there were likely several differences between groups including age and gender.

Finally, information on attrition was available from only four studies. Three studies reported attrition following group assignment ranging from 15% (Bickman et al. 2003) to 35% (Evans et al. 1998b; Hyde et al. 1996) for the total samples. The two studies with highest overall attrition also reported that attrition rates differed by groups, with participants receiving wrap-around more likely to drop out (42 vs. 22%, Evans et al. 1998b) and less likely to drop out (8 vs. 58%, Hyde et al. 1996).

### Intervention Characteristics

#### Participants

Altogether the seven studies included a total of 802 children and adolescents ( $M = 114.57$ ,  $SD = 52.57$ ). Sample sizes for individual studies ranged from 42 (Evans et al. 1998b) to 204 (Pullmann et al. 2006). The mean percentage of females was 33.57% ( $SD = 12.94$ , range 10–49), and the mean age of participants was 13.43 years ( $SD = 2.95$ , range 9.0–17.3). On average, study participants were most commonly identified as Caucasian 56.95% ( $SD = 29.99$ , range 0–88.24) and African American 23.10% ( $SD = 30.00$ , range 0–75.36).

Consistent with wrap-around's development as a process for targeting youth with significant challenges, participants in these studies experienced a range of serious problems. Most studies ( $n = 6$ ) reported that participating youth met criteria for a mental health disorder. The exception (Carney and Buttell 2003) targeted juvenile offenders, 21% of whom were also receiving mental health services. Five of the studies included youth at-risk of, or already in, out-of-

home placements (e.g., foster care, residential treatment center). Two studies targeted youth involved with the juvenile justice system (e.g., referred to juvenile court, had charges filed on them).

### *Program Information*

Each of the studies represented evaluations of separate wraparound programs in the United States. Lead agencies varied across studies including child welfare ( $n = 2$ ), juvenile justice ( $n = 2$ ), and mental health ( $n = 3$ ). The primary program goals reflected their lead agency mandates with child welfare emphasizing stabilizing placements, juvenile justice focused on reducing recidivism, and mental health targeting improving emotional and behavioral outcomes and maintaining children in their homes or least restrictive environments. The wraparound programs served youth from a mix of primarily rural ( $n = 2$ ), primarily urban ( $n = 2$ ), and both urban and rural areas ( $n = 3$ ).

### *Intervention Format*

All studies reported that youth and families were paired with wraparound facilitators (e.g., case managers, family specialists, wraparound care coordinators) to develop and coordinate their wraparound plans. Most programs ( $n = 6$ ) indicated that wraparound facilitators also provided some direct clinical services (e.g., behavior management, self-help skills). Four of the studies provided information on facilitator caseloads that ranged from 6 to 12 youth served at a time. One study (Clark et al. 1998) reported that a goal of the facilitator was to go a step further by supporting the caregiver to take over facilitation of their wraparound team as soon as possible. In contrast, the Department of Defense (DoD) study noted that a portion of their facilitators resided in “distant State[s], with little or no knowledge about the services available in the community in which a participant lived” (Bickman 2002, p. 28).

Six of the studies indicated that youth and family teams were formed to implement the plan and met at least monthly. Of these six studies, four reported team membership was based on the individualized needs of the youth and family with an emphasis on involving natural supports (e.g., relatives, friends, neighbors) on the team. The other two programs appeared to be more prescriptive about who participated (Evans et al. 1998b; Pullmann et al. 2006). The DoD study was the exception reporting, “there was no evidence that there were formal Treatment Teams or that a Team ever reviewed the Master Treatment Plan or progress toward goals” (Bickman 2002, p. 28). The authors stated they could not conclude that wraparound plans were “team-driven ... or that families were full and active partners” (Bickman et al. 2003, p. 153).

Very few of the studies provided specific information about the services and supports received by youth in the wraparound and control groups (see Bickman 2002 as an exception). In general, study authors reported youth receiving wraparound had access to many of the same services and supports as those receiving conventional services. The primary differences between groups were the assignment of a wraparound facilitator, development of a wraparound plan that reportedly followed the principles of wraparound, and availability of flexible funds to pay for nontraditional services (e.g., respite, recreational activities). Just over half of the studies ( $n = 4$ ) provided information on how long participants received wraparound. Average duration ranged from 12 to 24 months, with individual studies reporting that some participants were involved in wraparound for as little as 3 months and others as long as 36 months.

### *Intervention Integrity*

All studies reported that efforts were made to establish and maintain the integrity of the wraparound process. Authors reported that resource facilitators received pre-intervention training in the wraparound process ( $n = 6$ ) as well as ongoing supervision ( $n = 6$ ). In addition, the majority of studies ( $n = 6$ ) made at least some reference to specific training manuals, guidelines, or protocols used for guiding wraparound implementation. However, only two of the studies used fidelity measures to evaluate whether wraparound was implemented as intended. Rast and his colleagues used the Wraparound Fidelity Index ([WFI] Bruns et al. 2004) and found significantly higher fidelity ratings for youth receiving wraparound than those receiving conventional services. Bickman and his colleagues used the Service Process Inventory for Families and Youth (Bramley et al. 1999), a precursor to the WFI, and found no significant differences between wraparound and comparison groups.

### *Study Outcomes*

Effect sizes were calculated or estimated for each study outcome at the most distant posttest reported. The length of time to posttest averaged 19.8 months ( $SD = 11.3$ ) across the studies and ranged from a low of 10 months (Bickman et al. 2003) to a high of 42 months (Clark et al. 1998). All effect sizes, confidence intervals, and contributing studies are presented in Table 3.

### *Overall Effects*

Taken together, the seven studies contributed 66 effect sizes comparing outcomes of youth receiving wraparound and those receiving conventional services ( $M = 9.43$ ,



**Table 3** Summary of overall and domain-specific effect sizes for all studies and studies without imputed effects

Outcome domain	All studies			Studies without imputation <sup>a</sup>		
	ES <i>M</i>	95% CI	Studies involved	ES <i>M</i>	95% CI	Studies involved
Overall effect size	0.33*	0.14–0.53	1, 2, 3, 4, 5, 6, 7	0.40*	0.18–0.63	2, 3, 5, 6, 7
Living situation	0.44	–0.03–0.92	1, 3, 7	0.59	–0.32–1.50	3 & 7
Mental health	0.31*	0.01–0.61	1, 3, 4, 7	0.50	–0.11–1.11	3 & 7
Youth functioning	0.25*	0.04–0.46	1, 2, 3, 4, 6, 7	0.34*	0.10–0.58	2, 3, 6, 7
School functioning	0.27	–0.04–0.58	1, 2, 3, 7	0.38	–0.01–0.74	2, 3, 7
Juvenile justice	0.21	–0.02–0.44	1, 2, 3, 6, 7	0.26*	0.01–0.51	2, 3, 6, 7
Assets and resiliency	0.00		1 & 4			

Note: Study numbers refer to 1 Bickman et al. (2003), 2 Carney and Buttell (2003), 3 Clark et al. (1998), 4 Evans et al. (1998b), 5 Hyde et al. (1996), 6 Pullmann et al. (2006), and 7 Rast et al. (2008)

CI confidence interval, ES effect size, \*  $p < .05$

<sup>a</sup> Does not include Bickman et al. (2003) and Evans et al. (1998b)

SD = 7.18). Effect sizes of individual outcome measures ranged from a medium negative effect (–0.38) to a large positive one (1.09) demonstrating wide variability, with youth receiving wraparound faring better, worse, and no different than youth receiving conventional services on individual outcomes.

The random effects mean effect size across the seven studies was 0.33, falling between Cohen's (1988) guides for small (0.20) and medium (0.50) effects. Assuming a normal distribution of outcomes, the average youth receiving wraparound was better off than 63% of those receiving conventional services. This mean effect size was statistically significant ( $z = 3.36$ ,  $p = .0008$ ) with a 95% confidence interval (CI) of 0.14–0.53. When the studies and specific outcomes with imputed effect sizes were removed, the mean effect size increased to 0.41 (CI  $\pm 0.23$ ,  $z = 3.51$ ,  $p = .0004$ ).

#### Effects by Outcome Domain

As shown in Table 3, each outcome domain had measures from at least two studies included in this meta-analysis. The living situation domain showed the largest mean effect size (0.44) but was only marginally significant ( $z = 1.82$ ,  $p = .07$ ), most likely due to the small number of studies ( $n = 3$ ). Smaller (but significant) mean effects were found for mental health outcomes (0.31,  $z = 2.00$ ,  $p = .05$ ) and overall youth functioning (0.25,  $z = 2.32$ ,  $p = .02$ ). Similar results were found for the functioning sub-domains of school functioning (0.27,  $z = 1.69$ ,  $p = .09$ ) and juvenile justice-related outcomes (0.21,  $z = 1.83$ ,  $p = .07$ ). When imputed outcomes were removed, the effect sizes for each domain increased (see Table 3). Only two studies (Bickman et al. 2003; Evans et al. 1998b) included measures coded as representing the domain assets and resiliency (e.g., self-efficacy, positive functioning, life satisfaction).

Both studies reported no posttest significant differences between groups on these measures but did not include sufficient data to estimate effect sizes. Thus, the effect size for this domain was imputed as zero.

#### Effects by Study and Program Characteristics

While there are too few studies in this review to conduct formal moderator analyses, the variability in study effect sizes suggests strongly that an examination of potential moderators is warranted. To that end, a few study and program-level variables were identified to descriptively examine their influence on effect sizes. Because this review included both quasi-experimental and experimental control studies, a natural question is whether effect sizes differed by study design. Effects varied by study design with experimental studies demonstrating a small effect (0.17) compared to a medium effect (0.46) for the quasi-experimental studies. Average effect sizes appeared similar for the different lead agencies: child welfare (0.32), juvenile justice (0.39), and mental health (0.29). Similar consistency across study effect sizes were noted when effects were grouped by publication year (1990s = 0.31, 2000s = 0.35) and by number of months until the final posttest (10–12 months = 0.29, 13–18 = 0.39, and 19 and higher = 0.34).

#### Discussion

In recent years, our experience has been that researchers, policy makers, and advocates have pointed to individual outcome studies to provide support for and against the effectiveness of the wraparound process. Mean effects from individual studies in this review could be used to conclude wraparound has very little effect (Bickman et al.

2003; Clark et al. 1998), a small effect (Carney and Buttell 2003; Evans et al. 1998b), or a medium to large effect (Hyde et al. 1996; Pullmann et al. 2006; Rast et al. 2008). Even more diverse conclusions could be reached by considering individual outcomes within studies. The strength of the current review's meta-analytic approach lies in the ability to pool empirical findings across studies to form more robust conclusions than could be reached by individual studies alone.

Overall, the results of this meta-analysis support the view that wraparound can potentially yield better outcomes for youth with SEBD when directly compared to youth receiving conventional services. The mean effect size across all seven studies was 0.33, placing it in the small to medium effect range (Cohen 1988). If outcomes are restricted to just studies that allow direct calculation or estimation of effect sizes (as is commonly done for other meta-analyses), the mean effect size increases to 0.40. As a comparison, Weisz et al. (2006) found similar effect sizes in their meta-analysis of experimental studies that directly compared EBTs versus *usual clinical care* for youth with mental health disorders (their review did not include quasi-experimental studies). They found a mean effect size of 0.30 for all studies and 0.38 for the subset of studies that collected comparison data at follow-up. While these effects (and those from the current meta-analysis) were smaller than the effect size of 0.54 found in a broader meta-analysis of youth psychotherapy studies (Weisz et al. 1995), it is important to note that youth in the control groups all received active treatment. Stronger positive effects would be expected for comparisons to youth assigned to waiting list or no-treatment control groups.

Another finding from this meta-analysis is that wraparound showed positive medium effects for measures of youth living situation and smaller effects on measures of mental health outcomes and youth functioning (including both school and juvenile justice-related outcomes). While this difference was not statistically significant, and too few studies examined this effect to consider it robust, it is noteworthy because maintaining youth in their homes, schools, and local communities is one of the distinguishing features of wraparound compared to other children's mental health interventions. (VanDenBerg 2008). A similar pattern of findings has emerged from system of care site comparison studies, with more youth transitioning to stable and less restrictive settings (Manteuffel et al. 2008), while mental health and functioning outcomes have been mixed (Stephens et al. 2005) or not significant (Bickman et al. 1995). Perhaps youth living situation is more likely to be impacted by approaches such as systems of care and wraparound that explicitly emphasize supports to parents and siblings, team-based planning, and community-based care. Another consideration is that changes in living

situation may reflect a more direct measure of actual youth progress (e.g., the youth has moved from one placement to another) when compared to some clinical and functional measures whose connections to real-world change are less clear (e.g., higher or lower scores on a questionnaire; see Kazdin's (2006) commentary on *arbitrary metrics* and their implications for EBTs). To be sure, communities and families place a high value on maintaining youth in home- and community-based placements whenever possible (Knorth et al. 2008). With research showing that 30% of youth with SEBD receiving mental health services are referred to out-of-home placements within 2 years (Farmer et al. 2008), it is important to identify effective means for maintaining these children and youth in community-based settings.

Another striking finding of the current meta-analysis is that only 7 studies met inclusion criteria for this review. Though a recent narrative review identified 36 wraparound outcome studies (Suter and Bruns 2008), the majority did not directly compare outcomes between youth receiving wraparound to controls. Although each of the included studies is a unique implementation of wraparound, they represent less than 1% of the estimated 1,000 wraparound programs in the United States (Bruns et al. 2008a). Notably, many of the most highly respected and discussed wraparound initiatives are not represented in the current review. Wraparound Milwaukee (Kamradt et al. 2005), the Dawn Project (Anderson et al. 2008), and integrating wraparound with schoolwide positive behavior supports (Eber et al. 2002) have published descriptions of their procedures and have been held up as exemplars of communities successfully and sustainably employing the wraparound process to achieve positive outcomes. However, we are not aware of any controlled studies of impact of these projects, underscoring that the wraparound process has been innovated over time in communities, rather than developed by researchers who have subjected it to systematic course of empirical testing. Wraparound's idiosyncratic course of evolution has restricted the number of rigorous studies available for review.

Compounding this situation, only five studies in the current review presented sufficient data to directly calculate or estimate effect sizes. For this reason, we used a conservative approach to imputing those effects and presented the results both with and without them. The number of included studies dropped even further when specific outcome domains or potential moderators were examined. Thus, taken together, this relatively small sampling of outcomes clearly reduces confidence that we achieved a true estimate of wraparound's potential for impact in the field. This caution is especially warranted given the significant amount of work conducted in recent years to specify the wraparound process (Walker and Bruns 2006a),

create and disseminate fidelity measures (Bruns et al. 2004), and create research-based training and coaching protocols (Bruns et al. 2006a). Mean effect sizes found in the current review were based on the best evidence available, but they should not be considered the largest effects achievable.

### Limitations

Wide variability in methodological quality was found among the included studies. Typically, authors of meta-analyses include only experimental group design studies to focus on those that offer the best protections for interval validity. We chose to include experimental and quasi-experimental group design studies in this meta-analysis because of the small number of controlled outcome studies completed on wraparound to date. In addition to offering better representation of findings from the literature, this more inclusive approach has the benefit of providing an opportunity to examine the relationship between methodological design and outcomes. The descriptive finding that the mean effect sizes were smaller for the experimental studies than for the quasi-experimental studies underscores the importance of considering study characteristics along with the empirical findings. However, methodological rigor is not measured solely by random assignment. Serious methodological concerns were found for experimental studies including not reporting whether groups were similar at baseline (Clark et al. 1998) and differential attrition for wraparound and control groups (Evans et al. 1998b). In contrast, several quasi-experimental studies demonstrated methodological strengths including reporting equivalency of groups at baseline (Pullmann et al. 2006; Rast et al. 2008) and use of reliable and valid outcome measures to evaluate effects across multiple domains (Bickman et al. 2003; Rast et al. 2008). The methodological quality of the included studies remains a legitimate concern, and as more wraparound comparison studies are completed, such factors such as design, comparable groups, attrition, and reliability of outcome measures should be examined for their potential biases on intervention effects.

Another important concern is that we cannot conclude that all reviewed studies offered equivalent versions of wraparound. The programs varied on a number of factors including settings, target populations, stated goals, and outcomes measured. To address this concern, we summarized descriptive reports from study authors on program information, intervention format, and mechanisms the programs used to reach and maintain integrity of the wraparound process (i.e., training, protocols, supervision). Overall, these narrative reports provided support that participants in the majority of programs participated on teams that followed many of the essential elements of

wraparound. With that said, only a single study (Rast et al. 2008) used a fidelity measure that demonstrated significant differences between the wraparound and control groups.

Of particular concern was the finding that components of the DoD wraparound implementation (Bickman et al. 2003) seemed to contradict essential principles of the wraparound process. As stated by the authors, there was no evidence that wraparound teams were formed or met regularly to plan and review progress. In addition, many of the case managers did not reside in the same states as the youth and families with which they worked, thus they had little knowledge of the local communities. It is certainly possible that this study stands out because more implementation-related details were available from the extensive federal report (Bickman 2002), yet it is the only included study that provided anecdotal evidence for not following wraparound principles. Despite being called wraparound (and subsequently included in this review), the DoD program may have been mislabeled, underscoring the importance of fidelity measurement.

### Is Wraparound Evidence-Based?

Given the positive effect sizes found in this meta-analysis, coupled with the methodological and implementation concerns, it is natural to question whether wraparound can now be considered evidence-based. Of course, this question depends on what definition is used. For example, a recent survey of service providers in community mental health settings found that wraparound was the second most commonly identified “evidence based” intervention after cognitive behavior therapy (Sheehan et al. 2007). However, it is much more common for an intervention to be considered evidence-based if the outcome studies providing that evidence have met strict criteria (Chorpita et al. 2002; Lonigan and Elbert 1998). Following these criteria, the strongest evidence derives from an intervention demonstrating both evidence of *efficacy* (positive findings for specific disorders from carefully controlled research trials) and *effectiveness* (positive findings demonstrated in real-world settings with diverse samples). In practice, EBTs tend to have strong evidence of efficacy and much less (or no) evidence of effectiveness (Chorpita et al. 2002).

Based on the studies included in this meta-analysis, the wraparound process shows modest evidence of both efficacy and effectiveness, but does not meet the strict criteria for EBTs. Most efficacy criteria require positive findings from at least two independent studies with good experimental design. There were three experimental studies in the current review (Carney and Buttell 2003; Clark et al. 1998; Evans et al. 1998b) together yielding a small positive effect. However, these studies do not provide unequivocal support for efficacy due to high (and unreported) attrition,

the lack of a single treatment manual, and heterogeneity of target populations. Similarly, the current review demonstrated some evidence for the effectiveness of wraparound with studies taking place in real-world settings, with diverse samples, and with limited support from research teams. It is important to note that such evidence is missing from many children's mental health interventions that are now considered EBTs (Chorpita et al. 2002; Weisz et al. 2005). Yet, the studies in the current review provided insufficient details about the implementation of the wraparound process (e.g., duration, frequency, fidelity) and participants (e.g., race, ethnicity, gender, age) to provide clear evidence that wraparound would be effective with specific populations and settings.

The EBT criteria set a useful bar for evaluating the wraparound process, and better evidence for both the efficacy and the effectiveness of wraparound are sorely needed. It is equally important to acknowledge ways in which wraparound is different from specific clinical treatments that are typically the focus of efficacy and effectiveness trials. Indeed, research on wraparound may be conceived as responding to the call to "broaden the concept of evidence-based interventions to include evidence-based *processes* that may cut across a number of clinical interventions" (Huang et al. 2005, p. 621). Many different supports and treatments (both evidence-based and not) can be provided to youth and families through the wraparound process. As such, wraparound outcome studies must clearly identify and report the types of services and supports received by youth and families. It is an important empirical question whether youth with SEBD achieve better outcomes when EBTs are selected and facilitated within the wraparound process. Similarly, the children's mental health field would also benefit from knowing which services and supports (including EBTs) may be most advantageously made available to specific types of youth and families in tandem with the wraparound process.

#### Recommendations for Future Research

While this meta-analysis provides a systematic review of the best evidence on wraparound to date, there remains significant room for improvement. To move beyond promising findings to understanding how (and for whom) wraparound produces positive outcomes, future studies must meet several challenges. More evaluations of high-quality wraparound are critical to increase confidence in, and understanding of, its effects for youth with SEBD. Wraparound's widespread implementation across the United States and other countries provides many opportunities to examine its effectiveness. Because the wraparound process has been adopted by different lead agencies (e.g., mental health, child welfare, juvenile justice, education), it is particularly important to determine if differential effects

exist across target populations and types of outcomes. While no differences were found when effect sizes were categorized by lead agency in the present meta-analysis, individual studies reported differential effects for wraparound. For example, Clark et al. (1998) found benefits for boys, but not girls, on externalizing behaviors.

Although methodological quality has improved with more recent studies on wraparound, the field must strive for greater rigor in several areas. Clearly, study design must be carefully considered. Experimental studies provide the greatest protections against threats to internal validity, and more such studies need to be conducted to build the efficacy of this approach. In addition, the difficulty and ethical issues related to randomly assigning youth and families ensures that quasi-experimental studies will also play a role in wraparound's evidence base. In addition, the field could benefit from more single-subject multiple baseline studies as experimental alternatives to controlled group studies (see e.g., Myaard et al. 2000). To improve interpretation of findings, researchers need to fully document participant characteristics, recruitment, selection, assignment to conditions, and attrition. Also, the importance of using reliable and valid outcome measures cannot be overemphasized. In the present review, Bickman et al. (2003) provided a strong example for examining a wide array of outcome measures including living situation, mental health, youth functioning, school performance, juvenile justice, strengths and assets, and others (e.g., family functioning, costs). In addition, researchers need to identify measures that can directly answer the question, "Does wraparound really improve the lives of youth and families?" rather than relying on arbitrary metrics alone (see Kazdin 2006).

In addition to outcome measurement, studies need to collect more systematic implementation data including fidelity of team process and system-level resources and supports. All studies in the current review provided narrative descriptions of their wraparound team process; however, only one used a fidelity measure with demonstrated reliability (Rast et al. 2008). Fidelity measures demonstrate a critical link between the wraparound process and outcomes (Bruns et al. 2005) and may help explore what wraparound activities and principles are necessary and sufficient, similar to modular approaches in psychotherapy (Chorpita et al. 2005b). In addition, organizational and system-level factors (e.g., funding, case load size, professional development) are hypothesized to affect the quality of the wraparound process (Walker and Koroloff 2007) and represent a new area of empirical research (Bruns et al. 2006a, b). A logical comparison study could explore the differences between wraparound initiatives supported by systems of care (e.g., Wraparound Milwaukee, Kamradt et al. 2005; the Dawn Project, Anderson et al. 2008) and stand-alone wraparound programs.

Finally, because wraparound is a team-based process, and not a specific service, it must become common practice for wraparound evaluations to report what services and supports were received and to associate the type, intensity, and amount of services with outcomes. This is a tall order, given the individualized nature of wraparound and the range of services and supports available in different regions and agencies. Thus, it would benefit researchers and the field to capitalize on existing efforts to identify specific services (Sheehan et al. 2007) and practice elements common to multiple treatments (Chorpita et al. 2005a). With growing support that EBTs provide stronger effects than conventional services (Weisz et al. 2006), it is particularly important to document when youth receive EBT through a high-quality wraparound process. Controlled studies that examine the potential differences in outcomes for youth receiving wraparound, EBTs, and both represent an important avenue for future wraparound research (Tolan and Dodge 2005; Weisz et al. 2006).

## Conclusion

Despite the limitations in the existing research base, this first systematic examination of effects of the wraparound process demonstrates its potential for positive impact. The present review showed that wraparound can achieve positive effects in real-world settings, with diverse samples, and limited support from research teams. Future efficacy and effectiveness studies that rigorously examine high fidelity wraparound among diverse populations are necessary to build on this foundation. As Rosenblatt (1996) wrote over a decade ago, “research on the wraparound process needs to avoid the trap of reliance on a single large scale study.... positive results will need to be celebrated and publicized at the same time as negative findings are seriously interpreted” (pp. 113–114). With recent efforts to refine and specify the wraparound process completed, new experimental studies now underway, more consistent support to implementation being provided, and researchers ready to explore the benefits of supporting EBTs with evidence-based processes, the children’s mental health field stands to learn a tremendous amount about the potential of the wraparound process for improving the lives of youth and their families. In the meantime, results from this review and meta-analysis indicate that categorical calls for wraparound’s acceptance or dismissal are not yet evidence-based.

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