

Adherence to Wraparound Principles and Association with Outcomes

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Maintaining fidelity to the principles of the Wraparound process in serving children with emotional and behavioral disorders is a high priority. However, the assumption that greater adherence to the model will yield superior outcomes has not been tested. The current study investigated associations between adherence to Wraparound principles, as assessed by the Wraparound Fidelity Index, second version (WFI), and child and family outcomes in one federally funded system-of-care site. Results demonstrated that higher fidelity was associated with better behavioral, functioning, restrictiveness of living, and satisfaction outcomes. No associations were found for several additional outcomes making interpretation difficult. Our study provides initial support for the hypothesis that maintaining fidelity to the philosophical principles of Wraparound is important to achieving outcomes. The study also provides support for the construct validity of the WFI as a service process measure.

KEY WORDS: wraparound process; treatment fidelity; outcomes; evaluation; children's mental health.

Until the last decade, the program evaluation field focused almost exclusively on treatment outcomes and documenting whether or not programs worked (Greenberg, Domitrovich, Graczyk, & Zins, 2001; Rosenblatt & Woodbridge, 2003). In keeping with this trend, children's mental health services research has emphasized expanding the evidence base concerning effective treatments.

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However, the recognition of the difficulty in transporting effective approaches into “real world” settings (Weisz, Donenberg, Han, & Weiss, 1995) has illuminated the need for in-depth studies of how best to implement evidence-based practices in the field (Burns, Hoagwood, & Maulsby, 1998).

This increased emphasis on program implementation has brought renewed attention to the issue of measuring treatment adherence, a historically neglected construct that is nonetheless critical to both practice and research (Dane & Schneider, 1998; Moncher & Prinz, 1991). For researchers, careful measurement of the degree of program implementation is critical to explaining evaluation results, determining the relationships between program components and outcomes, and helping synthesize research findings across studies. For program developers and practitioners, consistent fidelity measurement is necessary to ensure that a model is not diluted or delivered in a manner that deviates from its principles, as well as to facilitate ongoing quality assurance efforts (Bond, Evans, Salyers, Williams, & Hea-Won, 2001; Bruns, Burchard, Suter, & Force, 2005).

Recent empirical studies have begun to examine the relationship between treatment fidelity and client outcomes. Treatment fidelity has been positively associated with improved outcomes in several community-based interventions including Multisystemic Therapy ([MST] (Henggeler, Schoenwald, Liao, Letourneau, & Edwards, 2002), assertive community treatment (McHugo, Drake, Teague, & Xie, 1999), and integrated dual disorders protocols (Drake et al., 2001). In addition, a recent review of 34 effective, manualized school programs found a consistent association between treatment fidelity and outcomes for the seven studies that focused on this relationship (Greenberg et al., 2001). Findings like these have reinforced the call for carefully planned model dissemination and closely monitored implementation processes (Schoenwald, Henggeler, Brondino, & Rowland, 2000). However, not all studies have found consistent positive associations between treatment integrity and outcomes (e.g., Farmer, Burns, Dubs, & Thompson, 2002; Weisman et al., 2002). Therefore, continued research is necessary to unravel the complexities within the relationship between fidelity and outcomes.

The current study attempts to further the understanding of the dynamics of treatment implementation within children’s mental health by exploring the associations between adherence to the philosophical principles of the Wraparound process and child and family outcomes. Described in several monographs (Burchard, Burchard, Sewell, & VanDenBerg, 1993; Burns & Goldman, 1999; Kendziora, Bruns, Osher, Pacchiano, & Mejia, 2001), book chapters (cf., (Burchard, Bruns, & Burchard, 2002) and manuals for trainers (Eber, 2003; Grealish, 2000; VanDenBerg & Grealish, 1998), the Wraparound approach is guided by a set of general elements and practice principles but administered in an individualized manner that results in a unique set of services and supports for each family (Burns & Goldman, 1999). Despite this flexibility in application, in sites that have implemented the model with a high degree of quality, *Wraparound* refers to a specific and definable process,

one that follows a sequence of steps and uses a number of specific strategies and methods.

Wraparound's flexible, family-centered approach has made the process attractive to administrators, family members, and advocates who prefer it to manualized interventions that may appear overly rigid or professional-driven. Positive outcomes from a number of experimental, quasi-experimental, and case studies of programs that either explicitly attempted to employ the Wraparound principles or that used approaches that resembled Wraparound have also bolstered its popularity in the field (see Burchard et al., 2002 for a review). But the model's individualized nature, along with a lack of nationally recognized accepted program standards or manual, has made assessment of Wraparound implementation a major challenge.

The elements of Wraparound (see Burchard et al., 2002) represent the most basic and well-recognized description of the Wraparound model by providing expectations for a program providing services to families using the Wraparound approach. Trainers nationally use these elements as the building blocks for training practitioners and administrators on Wraparound, and sites nationwide have adopted an innovative range of specific strategies for serving families in keeping with the elements (Walker, Koroloff, & Schutte, 2003). Therefore, a commonsense approach to measuring fidelity to the Wraparound model across sites has been to assess a program's adherence to Wraparound's essential elements (Goldman, 1999). Methods such as the Wraparound Observation Form (Epstein et al., 1998) and Wraparound Fidelity Index ([WFI] Bruns, Burchard, Suter, Leverntz-Brady, & Force, 2003) have allowed for improved assessment of program adherence to the elements of Wraparound (see (Bruns, Burchard, Suter, & Force, 2005, for a review of fidelity measures in Wraparound and their development). However, the link between Wraparound fidelity and important child and family outcomes has not yet been explored. The current study aimed to determine associations between scores on the Wraparound Fidelity Index, second version (WFI) and several outcome measures collected at a site participating in the evaluation of the federal Comprehensive Community Mental Health Services for Children and Families (CCMHS) program (Manteuffel, Stephens, & Santiago, 2002).

METHOD

Study Design

We focused on a federally funded CCMHS program in the rural Midwestern United States. This site used the Wraparound approach to plan and implement services for families with children experiencing emotional and behavioral disorders and employed the WFI to assess adherence to the Wraparound elements. The study

aimed to assess the relationship between adherence to the Wraparound elements and outcomes across the participating families.

Outcomes were assessed simultaneous to WFI administration (Time 1), as well as six months after WFI administration (Time 2), in order to investigate whether model adherence as assessed by the WFI predicted future outcomes. It was hypothesized that the strength of association between WFI scores and Time 2 outcomes would be at least equal to the association between WFI scores and concurrently assessed outcomes.

Measures

Model Adherence

The WFI is an interview that measures the quality of the Wraparound process as delivered to individual families. The WFI is composed of brief, confidential telephone interviews that assess adherence to the elements of Wraparound using caregiver, youth, and resource facilitator versions of the instrument. *Resource facilitator* is a generic term for the provider who delivers care coordination within the Wraparound approach; sites also may employ the terms *care manager* or *case manager*. Only caregiver and resource facilitator forms of the WFI were used for the current study due to particularly low response rates on the youth forms for this site.

The WFI measures adherence to elements by having each respondent rate agreement with items that were developed as indicators of specific Wraparound elements. WFI total scores range from 0 (*low fidelity*) to 8 (*high fidelity*). Pilot tests of the first and second versions of the WFI found adequate test-retest reliability (two-week test-retest found to range from .68 to .78 for the three forms) and internal consistency (alphas ranging from .78 to .90) for overall respondent scores. In addition, the first version of the WFI was found to be significantly associated with an external expert's ratings of fidelity, providing evidence of construct validity (Bruns, Burchard, Suter, Leverentz-Brady, & Force, 2004; Bruns, Ermold, & Burchard, 2001).

Child and Family Outcomes

Five outcomes were used in the current study, measures of which were used by the program as part of their participation in the national CCMHS evaluation. Measures included: (1) the total score from the Child and Adolescent Functional Assessment Scale ([CAFAS] (Hodges, 1999)), a clinician-rated measure of impairment in day-to-day functioning due to emotional, behavioral, psychological, psychiatric, or substance use problems; (2) the total Strengths Quotient from the

Behavioral and Emotional Rating Scale ([BERS] (Epstein & Sharma, 1998)), a 52-item scale designed to measure the emotional and behavioral strengths of children and adolescents; (3) the Restrictiveness of Living Environment Scale ([ROLES] (Hawkins, Almeida, Fabry, & Reitz, 1992), which quantifies the restrictiveness of a child's living environment on a 10-point scale from 0 (independent living) to 10 (incarceration); (4) item 1 from the family satisfaction questionnaire (FSQ1) employed in the national evaluation (ORC Macro, 2000) that asked the parent or caregiver "over the past 6 months, how satisfied have you been with services overall?"; and (5) item 7 from the FSQ (FSQ7), which asked the parent or caregiver "over the past 6 months, how satisfied have you been with your child's progress?" Parent responses to the two FSQ questions were rated on a five-point scale, ranging from 1 (*Very dissatisfied*) to 5 (*Very satisfied*).

Procedure

Service Provision Via the Wraparound Approach

The study site employed an intensive therapeutic care management model intended to follow the elements of the Wraparound approach. Each family's resource facilitator worked with the family to identify individuals to participate on the Child and Family Team, which then worked to develop the family's Individual Family Support Plan (IFSP). The team supported the implementation of the IFSP and identified and implemented informal supports designed to remain with the family after the family terminated formal services. The IFSP included a crisis and safety plan; short- and long-term goals for treatment and support services; roles and responsibilities of individual team members; operationalized and measurable steps to reach identified goals; indicators of progress (to be assessed monthly); and formal and informal resources.

As part of its system-of-care development, the study site developed an extensive array of services, including family support services and formal intensive therapeutic services (e.g., treatment foster care and MST) that could be accessed by the team. Services were paid per a case rate that covered all of the costs of care, both formal services and informal supports identified in the IFSP, though other payment sources, (e.g., private insurance) were accessed wherever possible prior to utilizing public funds.

Data Collection

Members of the site evaluation team, including members of a research consortium of family members, performed WFI and outcomes data collection. Data on the WFI and five outcomes were collected every six months, with outcome measurement beginning at enrollment and WFI interviews beginning after the first

six months of services. WFI interviews were administered by phone or in person by interviewers who did not have any personal relationship with the family or resource facilitator. For the purpose of the current study, the first WFI administered during the course of services was used in analyses.

Sample

To be eligible for the study program, identified youth had to be under 21 years of age and have a diagnosable mental health disorder (symptoms of which had persisted for at least one year) that resulted in functional impairment in self-care, learning, or behavioral control. The program targeted (a) youths involved in the child welfare system or at risk of becoming a state ward, (b) youths involved in the juvenile justice system or at risk of committing a criminal offense, and (c) youths at risk of school failure or dropping out of or being expelled from school due to behavior problems.

Thirty-six families participated in the current study. This sample represents about half of the families served by the site using the Wraparound process at the time of the study. Multi-informant scores could only be constructed for 7 of the 36 families due to missing data and WFI and outcome measurements not occurring within the same time frame. Thus, we will present results for two separate samples: 32 families for whom the WFI was administered to caregivers, and 18 families for whom the WFI was administered to resource facilitators.

Characteristics of the two samples of youth are presented in Table I. Youth in the caregiver and resource facilitator samples averaged approximately 12 years of age, ranging from 6 to 18 years. The vast majority of youths in both samples were male (81% and 78%, respectively) and Caucasian (100% and 89%, respectively). The majority also lived with one or more biological parent at the Time 1 data collection point, with only one youth in each sample in state custody. As shown in Table II, WFI total scores were 6.80 for the caregiver sample and 6.50 for the resource facilitator sample. With a maximum fidelity score of 8.00, these means indicate a relatively high level of adherence to Wraparound elements at the study site. Mean scores for the outcomes measures at Time 1 and Time 2 are also reported in Table II.

Data Analysis

In order to investigate the associations between fidelity and outcome data, correlational analyses using Pearson's product-moment correlations were conducted between WFI Total scores for each respondent and each outcome measure. Correlations were calculated with the WFI Total score transformed by $1/(9 - x)$ to achieve normality. These correlations were conducted between the caregiver form of the WFI and the five outcome measures included in analyses at both Time 1

Table I. Characteristics of Youth in the Caregiver and Resource Facilitator Samples

	WFI-CG sample (<i>n</i> = 32)		WFI-RF (<i>n</i> = 18)	
	<i>N</i>	%	<i>N</i>	%
Gender (male)	26	81	14	78
Race				
Caucasian	32	100	16	89
African American	0	0	1	6
Not reported	0	0	1	6
Custody				
At least one biological parent	27	84	13	72
Grandparent	4	12	2	11
Adoptive parent	0	0	2	11
State custody	1	3	1	6
Primary axis I diagnosis				
ADHD	12	38	5	28
Mood disorder	7	22	5	28
Adjustment disorder	6	19	1	6
Learning disorder	0	0	2	11
PTSD	2	6	0	0
Other	5	16	4	22
Age range	6–17		6–18	
Mean age (SD)	12.2 (3.2)		12.1 (3.6)	

Note. WFI: wraparound fidelity index, version 2; CG: caregiver; RF: resource facilitator.

and Time 2. However, because of missing data in the resource facilitator sample for the two satisfaction measures, resource facilitator WFI scores were only associated with the three other outcome measures. Thus, a total of 16 correlations were calculated.

Table II. Means and Standard Deviations for Wraparound Adherence and Outcomes for Youth in the Two Samples

	WFI-CG sample (<i>n</i> = 32)		WFI-RFsample (<i>n</i> = 18)	
	Time 1	Time 2	Time 1	Time 2
WFI total score	6.8 (1.30)		6.5 (0.91)	
CAFAS total	86.1 (40.0)	81.1 (37.7)	76.1 (37.5)	72.8 (35.9)
BERS strengths quotient	117.6 (19.4)	109.4 (13.0)	111.5 (15.1)	107.3 (15.4)
ROLES	2.2 (.63)	2.4 (1.07)	2.3 (.84)	2.6 (1.36)
FSQ1	4.1 (.76)	3.9 (.96)	—	—
FSQ7	4.2 (.94)	3.9 (.96)	—	—

Note. WFI: Wraparound fidelity index, version 2; CG: caregiver; RF: resource facilitator; CAFAS: child and adolescent functional assessment scale; BERS: behavior and emotional rating scale; ROLES: restrictiveness of living environment scale; FSQ1: “over the past 6 months, what has been your overall satisfaction with services?”; FSQ7: “over the past 6 months, how satisfied have you been with the progress your child has made?” Dashes indicate that satisfaction item scores not were not calculated for the WFI-RF sample because of missing data.

Next, a series of stepwise regression analyses were conducted to investigate the relationship between fidelity and changes in outcomes after fidelity assessment. In these regressions, outcome scores at Time 2 were regressed onto WFI scores, controlling for outcome scores at Time 1. We hypothesized that adherence to the Wraparound elements as assessed via the WFI would be positively associated with outcomes, thus one-tailed tests of significance were employed.

RESULTS

Correlational Analyses

Table III displays Pearson product-moment correlations between WFI total scores and outcomes assessed concurrently (Time 1) as well as 6 months post-WFI administration (Time 2). As shown, WFI total scores for the caregiver sample were significantly correlated with service satisfaction as assessed concurrently ($r[32] = .44, p < .05$) and satisfaction with the child's progress 6 months later ($r [32] = .47, p < .05$). Caregiver WFI scores were marginally significantly associated with behavioral strengths as assessed concurrently ($r[32] = .34, p < .1$).

WFI total scores for the resource facilitator sample were significantly associated with restrictiveness of living scores as assessed both concurrently and 6 months later ($r [18] = -.70, p < .001$ and $r[18] = -.71, p < .001$, respectively), and with child behavioral strengths 6 months later ($r[18] = .79, p < .001$). Resource facilitator WFI scores were also associated at $p < .1$ with behavior

Table III. Pearson Correlations Between Wraparound Fidelity Scores at Time 1 and Outcomes Assessed at Time 1 and Time 2 for the Two Samples

	WFI-CG sample ($n = 32$)		WFI-RFsample ($n = 18$)	
	Time 1	Time 2	Time 1	Time 2
CAFAS	.04	-.01	-.35*	-.20
BERS	.34*	.12	.37*	.79***
ROLES	-.06	-.21	-.70***	-.71***
FSQ1	.44**	.34	—	—
FSQ7	.23	.47**	—	—

Note. CAFAS: child and adolescent functional assessment scale; BERS: behavioral and emotional rating scale; ROLES: restrictiveness of living environment scale. FSQ1: "over the past 6 months, what has been your overall satisfaction with services?"; FSQ7: "Over the past 6 months, how satisfied have you been with the progress your child has made?" Dashes indicate that satisfaction item correlations were not calculated for the WFI-RF sample because of missing data.

* $p < .1$; ** $p < .05$; *** $p < .001$.

($r [18] = .31, p < .1$) and child functioning ($r [18] = .35, p < .1$) as assessed concurrently. All correlations noted above were in the hypothesized directions, with fidelity negatively correlated with ROLES and CAFAS scores and positively correlated with BERS and satisfaction scores.

Regression Analyses

A series of six stepwise regression analyses were conducted predicting Time 2 outcomes from Time 1 WFI scores after controlling for Time 1 outcome scores. Because of missing data for the two satisfaction questions in the resource facilitator sample, and the lack of change in ROLES scores from Time 1 to Time 2 for both samples, these analyses were restricted to the BERS and CAFAS for the resource facilitator sample, and the BERS, CAFAS, FSQ1, FSQ7 for the caregiver sample. As shown in Table IV, of these six regressions, there were two significant results. In the RF sample, WFI scores significantly predicted change from Time 1 to Time 2 for behavioral strength ratings as assessed via the BERS, $t(18) = 6.03, p < .001$. In the caregiver sample, WFI scores significantly predicted change in caregiver satisfaction with the child’s progress, $t (32) = 1.91, p < .10$. The results of the other four regressions were not significant.

Table IV. Results of Linear Regressions Predicting Outcome Scores at Time 2 from Wraparound Fidelity Scores at Time 1, Controlling for Outcome Scores at Time 1

Outcome (at Time 2)	Predictor (Time 1)	B	R ²
WFI-RF Sample ($n = 18$)			
BERS	BERS	8.37	.63**
	WFI	7.04	.93**
CAFAS	CAFAS	0.05	.01
	WFI	-12.5	.09
WFI-CG Sample ($n = 32$)			
BERS	BERS	0.56	.61**
	WFI	1.62	.64
CAFAS	CAFAS	0.66	.47**
	WFI	-3.30	.49
FSQ1	FSQ1	1.04	.66**
	WFI	0.05	.66
FSQ7	FSQ7	0.67	.43**
	WFI	0.55	.52*

Note. CAFAS: Child and adolescent functional assessment scale; BERS: behavioral and emotional rating scale; FSQ1: “over the past 6 months, what has been your overall satisfaction with services?”; FSQ7: “over the past 6 months, how satisfied have you been with the progress your child has made?” * $p < .1$. ** $p < .01$.

DISCUSSION

Within the field of children's mental health, treatment components received and how services are delivered may be the most important predictors of child and family outcomes (Burns, Hoagwood, & Mrazek, 1999; Hoagwood, Burns, Kiser, Ringeisen, & Schoenwald, 2001). However, for most community-based interventions, such hypotheses have not been well investigated. Though conducted in a single site and limited with respect to sample size, the results of the current study suggest that maintaining adherence to the Wraparound principles while delivering services is associated with several child and family outcomes.

We observed that, out of 16 correlations conducted, 15 were in the hypothesized direction, 5 were statistically significant, and an additional 3 were marginally significant. In addition, there was equal evidence for association between adherence scores and future outcomes as for concurrently assessed outcomes. Finally, regression analyses showed that Wraparound adherence at Time 1 predicted change in two outcomes: child behavioral strengths and caregivers' perception of the child's progress. These findings are consistent with one other study on the subject to employ the WFI as a fidelity measure, conducted in a different site in the Midwest, which found that WFI scores were significantly correlated with behavioral improvement as assessed by a weekly log of the occurrence of negative behaviors over a 6-month period (Hagen, Noble, Schick, & Nolan, 2005).

Several other interesting findings were observed. First, with respect to the question of which respondent's perceptions seem best related to outcomes, both caregiver and resource facilitator perceptions of Wraparound adherence were found to be significantly associated with several of the dependent variables. However, resource facilitator scores on the WFI were found to be more strongly associated with the outcomes assessed. This may have implications for future use of the WFI, as administrators and researchers decide which WFI forms to implement in a site. Other studies using the WFI have found that caregiver and youth reports of Wraparound adherence at the family level are more sensitive to the presence of program- and system-level conditions that support high-quality Wraparound (Bruns, Burchard, Suter, Leverentz-Brady, & Force, 2004). However, another study found that it is a combination of caregiver and youth reports that provides the greatest construct validity (Bruns et al., 2001). The current results underscore the complexity of this issue and provide further evidence for the importance of using multiple methods and/or informants to measure adherence.

Second, with respect to the types of outcomes to which adherence to Wraparound elements may be related, it is apparent that service outcomes such as satisfaction and residential restrictiveness are well associated with fidelity as assessed via the WFI. This is in keeping with other systems-of-care research (e.g., Bickman, Noser, & Summerfelt, 1999) that has showed these types of outcomes

may be most sensitive to the implementation of approaches that change the overall nature of service delivery.

In addition, it may not be surprising that significant associations were found between the WFI and behavioral strengths and service satisfaction within the caregiver sample, given that all three measures were completed by the same respondent at the same time, and that both the WFI and service satisfaction measure are assessing similar constructs. However, the results of the current study also indicate that WFI scores predict caregiver satisfaction with child progress (and not with services) six months later, and that resource facilitator WFI ratings are highly predictive of changes in parents' ratings of child behavior over time. Such results suggest that the association between Wraparound adherence and outcomes is neither a measurement artifact nor restricted completely to service measures such as satisfaction or residential placement. Because WFI scores were not associated with future CAFAS scores, additional research will be required to determine whether adherence to Wraparound elements is associated with specific outcomes, and to what extent the properties of specific outcome measures drive these associations.

Clearly the current study features a number of limitations, many of which have already been mentioned. First, the reliance on a single self-selected site restricts our ability to generalize these findings to a broad set of Wraparound programs, and limits our ability to explore how site characteristics may influence Wraparound fidelity and its association with outcomes. Second, reliance on a single site also means that many families in the current sample were served by the same resource facilitators, further restricting variance in Wraparound implementation and potentially confounding analyses. Third, the overall small sample size and inability to assess both resource facilitators' and parents' perspectives on Wraparound implementation restricted our overall power as well as our ability to make conclusions. And fourth, future research will benefit greatly from examination of a broader range of outcomes than those used here. The current study excluded a number of outcomes usually included in studies of sites in the national CCMHS evaluation because missing data would have further restricted sample sizes.

Though preliminary, the current study provides initial support for the hypothesized association between adherence to the Wraparound elements and outcomes for children and families. Given the proliferation of sites proposing to utilize the Wraparound approach, such findings should reinforce calls to ensure fidelity to the Wraparound approach and to community-based interventions generally. The results also provide support for the construct validity of the WFI; specifically, for the total score of the WFI for individual respondents. This support for the WFI is bolstered by the finding that future outcomes as well as concurrently assessed outcomes, which could be argued are merely a part of a "halo" of perceived fidelity, were predicted by WFI scores.

Most emphatically, the current study points to the need for additional research that employs a larger sample and more complete datasets that will allow for multi-informant WFI scores to be constructed, including parent, resource facilitator, and youth perceptions from the same family. In addition, future samples should include data from multiple Wraparound sites, so that relationships between site characteristics, fidelity, and outcomes can be explored. Such samples will allow for investigation of which components of the Wraparound approach are most important to achieving positive outcomes for children and families, and what types of program and system characteristics are most likely to enable these essential ingredients to exist. Given that specification of the Wraparound process remains in an early developmental phase, such research will not only address the question of whether quality of implementation leads to outcomes, it also may hold the promise of informing development of a more effective Wraparound process.

ACKNOWLEDGMENTS

The authors gratefully acknowledge the contributions of many individuals and agencies who have donated their time and efforts to the development of the Wraparound Fidelity Index. Special thanks to the Region III Behavioral Health Services Professional Partner Program and Families CARE in Kearney, Nebraska, for their collaboration on the current study.

This project is supported by several organizations including the Center for Mental Health Services, Substance Abuse and Mental Health Services Administration; the Child, Adolescent, and Family Unit of the Vermont Department of Developmental and Mental Health Services; Vermont Federation of Families for Children's Mental Health; and ORC Macro, Inc.

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