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Improving the Mental Health Functioning of Youth in Rural Communities

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Abstract Disparities in mental health outcomes for youth are often found between rural and urban areas. As part of an overarching question about under what circumstances and for whom, the wraparound process is beneficial (Suter & Bruns, 2009), this study specifically examined whether high fidelity to the wraparound model helped bridge the gap between outcomes in urban and rural areas for youth with complex behavioral health challenges. Youth participating in Indiana's Community Alternatives to Psychiatric Residential Treatment Facilities Medicaid demonstration grant between 2008 and 2011 ($n = 811$) resided in urban ($n = 615$) or rural ($n = 196$) communities. Logistic regression examined treatment and contextual predictors of improvement in the mental health functioning of youth. High fidelity to the wraparound model and higher levels of initial behavioral health symptoms predicted improvement in mental health outcomes, with a small, but significant effect size ($R^2 = .129$). Geography, demographic characteristics, initial risk behaviors, nor functional needs were significant predictors of change. Effectively implementing the wraparound process is a feasible strategy to reduce disparities in behavioral health outcomes for youth with complex needs in rural communities.

Keywords: child mental health, mental health disparity, outcomes, rural mental health, wraparound services

Over 60 million individuals call rural America their home (U.S. Census Bureau, 2013). While rural America can provide a less stressful lifestyle, decreased reliance on industry and closer community ties than some urban areas, remoteness may be associated with disparities. One such disparity is the lack of mental health services available to the rural mentally ill (Samet, Friedmann, & Saitz, 2001). Disparities impact practices by influencing access, quality, and outcomes of behavioral health care (SAMHSA's Office of Behavioral Health Equity [OBHE], 2012). Behavioral health care in rural areas may be minimal and delivered by professionals not equipped to handle mental health issues, specifically the skills needed to effectively treat and support the mental health needs of youth (McCabe & Macnee, 2002). Due to limited access and availability of appropriate and effective care, rural youth are less likely to improve their overall mental health functioning than those youth living in urban America (Inder, Berry, & Kelly, 2011; McCabe & Macnee, 2002; Smalley et al., 2010). Recognizing disparities between urban and rural mental health service delivery, researchers and professionals now pay more attention than ever before on how to bridge the gap between service accessibility, availability, acceptability, and effectiveness (Human & Wasem, 1991; Inder et al., 2011; McCabe & Macnee, 2002; Rost, Fortney, Fischer, & Smith, 2002; Safran et al., 2009; Smalley et al., 2010).

Social support structures, community-based services, and the need for more highly trained professionals are key components to bridge human service disparities between urban and rural communities (Bauer, Batson, Hayden, & Counts, 2005; Kelleher, Taylor, & Rickert, 1992; Letvak, 2002; McCabe & Macnee, 2002). In many communities, social workers are the

helping professionals who develop, identify, and implement models of practice to reduce disparities in care and outcomes across geographic areas (Beinecke & Huxley, 2009; Eberhardt & Pamuk, 2004). The failure to do so leaves several million youth at continued risk of harm from possibly debilitating symptoms.

One practice model that offers these key components—support structure, community-based services and highly trained professionals—is the wraparound model. Wraparound is an intensive, holistic method of engaging and empowering youth with complex behavioral health challenges and their families so that they can live in their own homes and communities and realize their hopes and dreams (Bruns et al., 2004). As a care coordination process that encourages the use of community partnerships, collaborative action, access to needed supports and services, and accountability, wraparound differs from traditional interventions in that it utilizes a strength-based and team-based planning and implementation process that focuses on problem-solving skills, coping skills, and self-efficacy to integrate youth into the community (Bruns et al., 2004). By design, the wraparound model theorizes that support structures, community-based services, and use of highly trained professionals are paramount in overcoming rural mental health disparities (Walter & Petr, 2011). The wraparound approach also promotes access, availability, and acceptability of mental health services (Bruns, Suter, & Leverentz-Brady, 2008).

The wraparound process, based on 10 principles, has been operationalized through four phases and related activities (Bruns, Suter, Force, Sather, & Leverentz-Brady, 2007). Table 1 reviews the elements of the wraparound process (family voice and choice, team-based, natural supports, collaboration, community-based, cultural competence, individualized, strengths-based, unconditional [persistence], and outcome-based). Emerging evidence has found a positive relationship between high wraparound fidelity and good outcomes (Cox, Baker, & Wong, 2010; Effland, Walton, & McIntyre, 2011; Pullmann, Bruns, & Sather, 2013; Suter & Bruns, 2009; Walton, 2011). Therefore, consistent with effective implementation of evidence-based practices (Bond, Drake, McHugo, Rapp, & Whitley, 2009; McHugo et al., 2007; Sheidow, Donohue, Hill, Henggeler, & Ford, 2008), fidelity to the wraparound model is ideally measured and monitored in practice to support effective implementation and in research, to increase evidence of the relationship of the process to desirable outcomes (Suter & Bruns, 2009).

Although evidence suggests that the wraparound process is effective in mental health, child welfare, and juvenile justice and is often supported by public policy (Bruns et al., 2010; Suter & Bruns, 2009), the research base is limited. Not targeting specific populations and rarely measuring the variability among wraparound services (i.e., fidelity to the model), limit available research (Suter & Bruns, 2009). Few studies consider contextual predictive factors, including geography (Painter, 2012; Weiner, Leon, & Stiehl, 2011).

As part of an overarching question regarding under what circumstances and for whom the wraparound process is beneficial (Grimes et al., 2011; Suter & Bruns, 2009), this study specifically asks if geographic location (e.g., rural or urban) predicts youth mental health outcomes. Additionally, does maintaining high fidelity to the wraparound model help bridge the gap between mental health outcomes for youth with complex behavioral health needs in urban and rural areas? Are other contextual, demographic factors (e.g., age, gender, race, ethnicity) or

a youth's initial severity of need related to improvement in mental health symptoms and life functioning? To address these questions, we examined existing data for youth involved in Indiana's Community Alternatives to Psychiatric Residential Treatment Facilities (CA-PRTF) Medicaid demonstration grant between 2008 and 2011.

Table 1

Principles of Wraparound

Wraparound Principle (Element)	Description
Family Voice and Choice	Family and child perspectives are elicited and prioritized in all phases of the wraparound process. Planning is grounded in family perspectives, and the team strives to provide options so that the plan reflects family values and preferences.
Team-based	The wraparound team is made up of individuals agreed upon by and committed to the family.
Natural Supports	The team seeks out and encourages the participation of members from the family. The plan included activities and intervention involving these natural supports.
Collaboration	Team members cooperate and share responsibility for developing, implementing, monitoring, and evaluating a single plan. The plan blends team members' perspectives, mandates, and resources. Each team members' work is guided by the plan.
Community-based	The wraparound team implements service and support strategies that take place in the most inclusive, most responsible, most accessible, and least restrictive settings possible.
Cultural Competence	The wraparound process demonstrates respect for and builds on the values, preferences, beliefs, culture, and identity of the child, family, and their community.
Individualized	To achieve the goals and objectives in the wraparound plan, the team develops and implements a tailored set of supports and services.
Strength-based	The wraparound process and plan identify, build on, and develop the capabilities, knowledge, skills, and assets necessary for success.
Unconditional	A wraparound team does not give up on, blame, or reject youth and their families. When faced with challenges or a setback, the team continues working towards meeting the needs of the youth and family and towards achieving the plan goals. The team agrees when a formal wraparound process is no longer necessary.
Outcome-based	The team links the youth and family's goals of the wraparound plan to address identified needs and support or build strengths. The team uses observable or measurable objectives to monitor progress and revise plans to address necessary changes.

Note. Adapted from "Ten Principles of the Wraparound Process," by E. J. Bruns, J. S. Walker, J. Adams, P. Miles, T. W. Osher, J. Rast, J. D. VanDenBerg and National Wraparound Initiative Advisory Group, 2004, Portland, OR: National Wraparound Initiative, Research and Training Center on Family Support and Children's Mental Health, Portland State University.

Mental Health in Rural America

Youth residing in rural America tend to have higher levels of major depression and substance abuse than those residing in urban areas (Cellucci & Vik, 2001). The prevalence of major depression is significantly higher in rural areas (6.11%) than among urban dwellers (5.16%; Probst et al., 2006). Up to 40% of mentally ill youth in rural areas have a comorbid substance use disorder (Gogek, 1992), which is significantly higher than for youth in urban communities. Of particular concern is the high rate of rural youth using alcohol, tobacco, methamphetamines, inhalants, marijuana, and cocaine (Cellucci & Vik, 2001). All other rates of childhood mental health problems are comparable between rural and urban settings (Howell & Teich, 2008; Lambert, Ziller, & Lenardson, 2008). While prevalence rates remain consistent across geographical areas, there is little, if any, consistency in the effectiveness of behavioral health treatment between rural and urban youth (Lenardson, Ziller, Lambert, Race, & Yousefian, 2010). Understanding this disparity is the first step to improving behavioral health services for rural youth and families.

Mental Health Disparities

The disparity between mental health treatment in urban versus rural communities is a three-part problem of accessibility, availability, and acceptability (Human & Wasem, 1991; Smalley et al., 2010).

Accessibility. Overall, accessing needed services is more problematic in rural settings, especially due to socioeconomic challenges (Lenardson et al., 2010). Rural Americans are uninsured at a rate of 20% higher than that of their urban counterparts (National Rural Health Association, 1999). Additionally, rural Americans are more likely to live in poverty, yet less likely to receive government entitlements and aid (<http://www.ruralhealthweb.org/go/left/about-rural-health>). These socioeconomic differences result in rural youth being 20% less likely to have a mental health visit than urban youth (Howell & Teich, 2008). Simply stated, many rural Americans cannot afford proper mental health treatment, which instantly limits their access to such services (Rost et al., 2002). Geography also influences accessibility. Rural families may deal with practical issues of transportation and longer distances to treatment facilities (McCabe & Macnee, 2002).

Availability. Generally speaking, rural areas offer fewer mental health resources than urban communities (Inder et al., 2011; Weiner et al., 2011). With these limited resources also come an insufficient number of qualified and highly trained mental health providers (Inder et al., 2011; Olsson, 2000). Bird, Dempsey, and Hartley (2001) discovered that more than 85% of America's mental health professional shortages are in rural areas. Approximately 55% of rural counties do not have a psychologist, psychiatrist, or social worker who specializes in the treatment of mental health needs (Inder et al., 2011). Additionally, 20% of these counties reported having no mental health services of any kind (Hartley, Bird, & Dempsey, 1999). Limited availability of mental health services also makes it challenging to recruit professionals as caseloads tend to run high, salaries are less, there are fewer professional supports, and there is an increased risk of ethical dilemmas (Smalley et al., 2010).

Research also indicates that many individuals residing in a rural community lack basic knowledge about both physical and mental health illnesses (Inder et al., 2011). This lack of knowledge is a result of the absence of available services and educational opportunities available in rural America (Inder et al., 2011).

Acceptability. Stigma towards the use of mental health services often limits the acceptance of treatment by rural parents (Starr, Campbell, & Herrick, 2002). Increased stigma and decreased anonymity in rural communities lowers this acceptance (Mohatt, Bradley, Adams, & Morris, 2005). Many rural residents will not seek outside services as they do not want to risk their family or friends seeing their car in the parking lot of a local mental health provider (Bauer et al., 2005). This lack of acceptability might also increase the perception that psychological services are less available and accessible (Rost, Fortney, Zhang, Smith, & Smith, 1999).

Future of Rural Mental Health

Geographic issues of accessibility, availability, and acceptability result in rural youth not receiving services or entering services with more serious symptoms (Rost et al., 2002). Such issues pose serious challenges for effectively addressing the mental health challenges of rural youth and families. In order to reduce these mental health disparities, rural communities are trying to increase the availability of community-based services and the use of informal support structures and to bolster recruiting methods to attract highly trained professionals (Bauer et al., 2005; Kelleher et al., 1992; Letvak, 2002; McCabe & Macnee, 2002). These strategies characterize core components of a high quality wraparound approach to service delivery for youth with complex mental health challenges.

Wraparound Approach to Service Delivery

The wraparound model's 10 principles guide service delivery (Bruns et al., 2004) addressing issues of accessibility, availability, and acceptability. Beginning with an engagement process, youth and family perspective (voice) has primary importance during all wraparound decisions (choice). Second, the intervention plan, services, and supports are family driven, individualized, culturally competent, and community-based. Third, the wraparound process identifies and builds the family's natural support system. Fourth, the wraparound process focuses on strengths to build talents, assets, and positive capacities.

The wraparound plan typically includes formal services and interventions, together with community services and interpersonal support and assistance provided by friends, kin, and other people drawn from the family's social networks (Wraparound Basics, 2012). Wraparound facilitators differ from other mental health professionals (e.g., less likely to have an advanced degree, more likely to have recently received training often through agency in-services, and more likely to report fully implemented treatment protocols; Bruns, Walrath, & Sheehan, 2007).

Research supports the use of a wraparound approach to increase access to and continuity of mental health treatment in rural America (Valleley et al., 2007). The wraparound approach is consistent with an ecological perspective for assessing and treating mental health issues in rural

America (Heflinger & Christens, 2006). The strength-based approach utilized within the wraparound model further supports improvement in mental health functioning of youth (Barksdale, Azur, & Daniels, 2010). However, the improvement in youth mental health functioning is contingent upon fidelity to the model and the baseline needs of youth receiving services (Painter, 2012).

Method

Current Study

The purpose of this study was to determine whether geographic location (e.g., rural or urban) was a predictor in youth mental health outcomes. Additionally, whether fidelity to the wraparound approach of service delivery helped bridge the gap between mental health outcomes in urban and rural areas. We also included contextual factors, whether the extent of a youth's baseline needs (behavioral health symptoms, functional impairments, or risk behaviors) predicted improvement in mental health functioning, when controlling for demographic characteristics (age, gender, race or ethnicity). This study was an interim study of the Indiana CA-PRTF grant, using existing data from Indiana's CA-PRTF Medicaid demonstration grant to investigate these questions. It builds upon another interim study which explored the relationships among the level of community system of care development, adherence to the wraparound model, and outcomes for youth (Effland et al., 2011).

Such research can help improve the mental health functioning of youth by identifying variables that play an integral role in positively or negatively impacting mental health outcomes (Nguyen, Wilkes, & Cawthorpe, 2010). Improving knowledge of variables related to mental health functioning can help shape the way social workers and other mental health professionals engage, assess, plan, and intervene in the lives of America's youth and families (Robson & Gingell, 2012). It also sheds light on whether the wraparound model might address issues of access, availability, and acceptability in rural mental health services.

Study Participants

The researchers used a purposive non-random sample of youth who received grant services from January 1, 2008 through October 1, 2011. To receive grant services, all youth had intense behavioral health needs which interfered with interpersonal, family, school or community functioning, risk behaviors, and caregiver needs. Participants were between ages of 6 to 21 and had a household income of less than or equal to 150% of the federal poverty level.

Demographic data was collected from CA-PRTF grant applications, a state database used to record and manage grant services, and Medicaid claims data. Age, gender, race, and ethnicity (Hispanic/Latino), characterize youth. For 811 youth in the sample, ages ranged from 6 to 21 ($M = 12.11$, $SD = 3.14$). A majority of the youth identified as male (73%) and white (78%). Participants also identified as African American (16%), multi-racial (4%), Native American (1%), and other (1%). Just over 4% of participants identified as Hispanic in origin. Youth lived in the community with their parents, extended family, or in foster care. Through self-report or knowledge of the wraparound facilitator, 42% had involvement with child protective services during or within six months of participation in the grant.

Externalized behavioral disorders were most frequently reported through diagnoses. The most common reported diagnosis was attention deficit disorder/attention deficit hyperactivity disorder (29%) followed by bipolar disorder (24%), oppositional defiant disorder (19%), conduct disorder (8%), post-traumatic stress (7%), and anxiety (3%).

Through the demonstration grant, youth and caregivers received intensive, non-traditional community-based Medicaid services, which were coordinated through the wraparound process. Grant services included: respite, habilitation (skill building), consultative clinical and therapeutic services, non-medical transportation, family support and training, and flex funds. While receiving grant services, the youth were also eligible for usual Medicaid treatment services. The average length of stay for youth in grant services between January 2008 and June 2011 was 307 days, ranging from 25 to 1082 days. Of this sample, 538 had completed one episode of intensive community based services.

Rural/Urban Divide

Researchers split their data file into urban and rural youth using definitions provided by the U.S. Census Bureau (2002). A rural county is any county with a total population of less than 50,000 people. An urban county is any county with a total population greater than 50,000. Indiana has 64 counties classified as rural and 28 as urban. The majority of youth (615; 76%) lived in urban areas; 196 (24%) of youth lived in rural areas. The sample's percentage of rural youth was slightly higher than the national average (20%) of Americans living in rural areas (U.S. Census Bureau, 2013).

Measures/Instruments

Child and Adolescent Needs and Strengths Assessment (CANS). The comprehensive, multi-system Child and Adolescent Needs and Strengths (CANS; Lyons, 2009) assessment tool was adopted by Indiana in 2007. The CANS includes seven dimensions: child behavior or emotional needs, life functioning, risk behaviors, child strengths, acculturation, caregiver strengths, and caregiver needs. Within each dimension, specific items identify strengths and needs that may impact functioning.

Validity and reliability of the CANS has been demonstrated (Lyons, 2009; Lyons & Weiner, 2009). The audit reliability of the CANS is 0.85 (Lyons, 2009). The CANS also demonstrates item level validity (average among studies = 0.80), which supports the use of individual items in data analysis (Anderson, Lyons, Giles, Price, & Estle, 2003). These high levels of reliability are also true when using the assessment for matters of mental health, child welfare, and juvenile justice (Leon, Ragsdale, Miller, & Spacarelli, 2008; Lyons & Weiner, 2009; Sieracki, Leon, Miller, & Lyons, 2008).

Before rating the CANS, clinicians are trained and periodically certified, demonstrating reliability by rating vignettes online with a minimum reliability of a .70 (intra class correlation coefficient). The average CANS certification reliability for Indiana's providers is .79. Wraparound facilitators, who complete the CANS with youth, families, and a team, receive

additional in-person training and demonstrate .75 or higher reliability. Wraparound facilitators complete the CANS for each youth and caregivers at service baseline, every six months, and at the end of grant services.

The CANS uses a four-point scale (0, 1, 2, and 3) to rate the needs and strengths of youth and caregivers. A rating of zero (0) reflects no evidence of a need or the presence of centerpiece strength (child strength only). A rating of one (1) indicates the presence of a need, but no current functional impairment, or the existence of a usable strength. The needs items rated two (2) or three (3) are "actionable" as the need interferes with functioning or is dangerous or disabling (Lyons, 2009). The strength items rated two (2) or three (3) need development or are not identifiable (Lyons, 2009). For the study, as has been shown to be useful in routine practice, domain scores (e.g., mental health, risks, functioning) were created by calculating the mean of specific items for five CANS dimensions and multiplying each mean by 10 (Lyons, 2009; Lyons, Griffin, Quintenz, Jenuwine, & Shasha, 2003; Weiner, Schneider, & Lyons, 2009).

For the study, a new "youth needs domain" was created by calculating the mean of behavioral health symptoms, functioning, and risk items. This is supported by a study of the psychometric properties of the CANS, which found that items in the youth need domains are related, but that the strength and caregiver domains represent separate constructs (Doucette, 2007; Lyons, 2009).

Consistent with the methodology used for the state's outcome performance measures, we used a Reliable Change Index (RCI; Wise, 2004) to calculate improvement in youth needs. Using the mean certification reliability for Indiana's CANS users and the standard deviation of mean ratings for each domain, RCI indices were calculated for each domain using a 2008 sample of 31,493 youth who received public behavioral health services. The formula follows:

$$RCI = 1.28 * (SD \text{ of CANS domain mean}) * \sqrt{(1 - \text{reliability})}$$

For this study, the dependent variable was reliable improvement in youth needs. The RCI score, means (with standard deviation in parentheses) for the youth needs domain 2.0989, 1.28 (3.55314) is consistent with the RCI scores for related domains (mental health 2.20, 6.92 [3.75], functioning 2.27, 7.03 [3.88], and risk domains 1.58, 2.20 [2.70]; Lyons, 2008). Between the beginning of intensive services and the last CANS assessment before June 30, 2011, reliable improvement in youth needs was found for 349 (33.2%) of youth. Over an episode of care, reliable improvement in at least one domain is expected for 60-80% of youth; within each domain 20-40% improvement is expected (Effland et al., 2011; J. S. Lyons, personal communication, April 25, 2013). Improvement in youth needs was coded as one (1) and no improvement was coded zero (0).

Wraparound Fidelity Index 4.0 (WFI-4). The Washington University Wraparound Evaluation and Research Team (WERT; Bruns et al., 2010) developed an index to measure adherence to the wraparound process. The WFI-4 is a survey that measures the nature of the wraparound process that an individual family receives. The index examines the ten elements associated with practice model fidelity: family voice and choice, team-based, natural supports, collaboration, community-based, cultural competence, individualized, strengths-based,

persistence, and outcomes-based (Bruns et al., 2004). The WFI-4 also has high reliability scores, with internal consistency ranging from 0.83 to 0.92 (Bruns et al., 2007a).

Structured phone surveys used the WFI-4 (Bruns et al., 2007a) annually and shortly after grant services ended. WFI interviewers completed a comprehensive training protocol, which includes certification to ensure that WFI ratings are reliably scored for each of the ten WFI elements. Interviewers rated each question using a 0 (*low fidelity*) to 2 (*high fidelity*) ratings. Item ratings were summed and divided by the highest possible fidelity score resulting in a score between zero (0) and one (1). Scores closer to one (1) indicate higher fidelity (Bruns et al., 2007a).

Combined total WFI-4 scores [including information from wraparound facilitators ($n = 702$), caregivers ($n = 334$), and youth ($n = 58$)] were used to maximize the size of youth and families included in the analysis, retaining family and youth voice. Caregiver fidelity ratings were available only for one-half of youth. Youth fidelity ratings were obtained only for youth 11 years and older. As using only ratings from the facilitators most likely would result in inflated variability scores (Painter, 2012), family and youth fidelity ratings were retained. Facilitator, caregiver, youth, and combined WFI-4 ratings are compared in Figure 1.

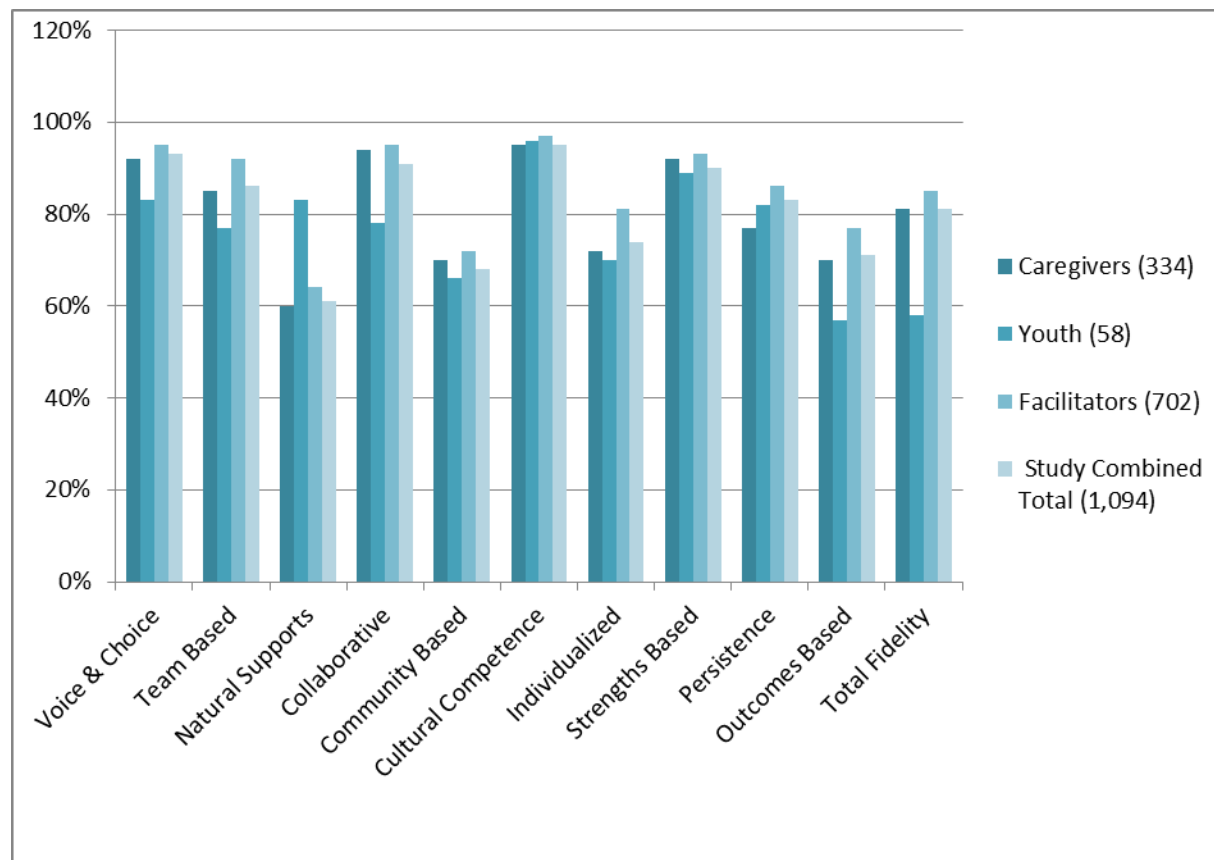


Figure 1. Comparison of wraparound fidelity scores in 2012 among caregivers, youth, and facilitators.

Overall, the combined total WFI-4 scores are more similar to the caregiver than to the facilitator ratings. Using the composite measure also retains the maximum number of available fidelity ratings and participants for the analysis. Statewide in 2011, the overall total combined wraparound fidelity score for intensive youth services was 84% (Stanisic, 2013), almost reaching high fidelity for the state (i.e., > 85%; Bruns, Suter, Force, & Burchard, 2005). Variability in adherence to the practice model occurs. We used the most recent total combined wraparound fidelity score as a predictive variable.

Data Analysis

To address the research questions, we used binary logistic regression to predict whether or not a youth would have reliable improvement in youth needs (a combined CANS measure of behavioral health symptoms, functional impairments, and risk behaviors) given a set of contextual and treatment predictor variables. Based on previous studies, the regression model included 11 predictive items. Contextual predictive items included the youth's rural or urban classification, youth demographics (age at baseline, gender, race, and ethnicity), baseline youth risk domain, baseline youth functioning domain, and youth behavioral health domain. Race categories included African American, Native American, and multi-racial. The predictive treatment variable was the total combined wraparound fidelity score. The dependent variable was reliable improvement in youth needs (combined functioning, risk, and behavioral health items). The researchers used SPSS 19.0 for Windows to complete these statistical tests.

Results

The purpose of this study was to determine whether geographic location (e.g. rural or urban) was a predictor in youth mental health outcomes. Additionally, whether fidelity to the wraparound approach of service delivery helped bridge the gap between mental health outcomes in urban and rural areas. Researchers also analyzed whether the extent of a youth's baseline predicts improvement in mental health functioning.

Predicting Reliable Improvement in Youth Needs

Researchers applied binary logistic regression to the data with likelihood-ratio criterion. The best model was robustly significant, with a -2 Log likelihood of 999.92, $\chi^2 = 80.86$ ($df = 11$, $p < 0.001$). This model also passed tests for goodness of fit and tests searching for collinearity. Regarding goodness of fit, the final model passed the Hosmer and Lemeshow Test and was not significant ($p = 0.561$). Regarding collinearity, each variable passed tests for collinearity with tolerance scores all above 0.10 and VIF scores all below 10.

The binary logistic regression model improved overall performance over the null model by 12.9%, resulting in an overall percentage correct of 67.9%. This results in a small effect size (Nagelkerke $R^2 = 0.129$), which indicates that there are factors in the model not influencing mental health functioning or that there are missing factors that relate to outcomes. Additionally, the model correctly predicted non-improvement in youth needs at a level of 88%. Two of the 11 total variables contributed to the best model predicting reliable improvement in youth needs. Total combined wraparound fidelity ($p = 0.022$) and a youth's behavioral health needs at baseline ($p = 0.004$) were the significant predictors of improvement. Youth demographics, other

baseline scores, and geographic location were not significant predictors of reliable improvement, but were retained as controls for the model. See Table 2 for a summary of outcome statistics for variables included in the binary logistic regression model predicting reliable improvement in youth needs.

Table 2

A Summary of Outcome Statistics for Variables Included in the Best Binary Logistic Regression Model for Predicting Reliable Improvement to Youth Needs

Predictor	β	SE	Wald	p	Exp(B)
WFI Total	1.84	.80	5.28	*0.022	6.31
Age @ Baseline	.18	.25	0.55	0.458	1.02
African American	.31	.20	2.27	0.132	1.36
Native American	1.38	.73	3.54	0.060	3.96
Multi-racial	-.37	.42	0.76	0.384	.69
Hispanic	-.66	.43	2.39	0.122	.52
Gender	.05	.17	0.07	0.788	1.05
Rural or Urban	.08	.18	0.21	0.652	1.08
Baseline Risks	-.61	.13	0.22	0.638	.94
Baseline Functioning	.18	.13	2.21	0.137	1.22
Baseline Behavior Health	-.07	.03	8.09	**0.004	1.08
Constant	-5.62	.89	39.41	0.000	.01

Note. $n = 811$.

* $p < 0.05$. ** $p < 0.01$.

Discussion

Youth involved with Indiana's CA-PRTF Medicaid demonstration grant improved in their overall functioning regardless of their urban or rural classification. Practice model fidelity and the relationship between fidelity and outcomes are similar between the two groups.

Similar fidelity scores and the lack of geography being a significant predictor of improvement provide evidence that the wraparound process could bridge the gap in accessibility, availability, and acceptability of behavioral health services for urban and rural youth. High fidelity to the wraparound principles of natural supports, community-based, unconditional, and team-based promotes service availability and acceptability. These principles

promote service availability and acceptability by utilizing a family's natural support structure, a structure that commits itself to the family. These natural supports are readily available and accessible to a family, unlike many formal services in rural communities. Additionally, the community-based approach of wraparound service delivery utilizes both formal and informal services unique to a given community and family.

High fidelity to the principles of family voice and choice, collaboration, cultural competence, and individualized and strength-based promote service acceptability. The wraparound approach grounds itself in a family's perspective and values. Service plans take into consideration the perspective of each team member and the beliefs and cultures of the family and community. The identification of a family's strengths also empowers the family and likely increases their acceptability.

High fidelity to the wraparound principles is evidence of the narrowing gap between the mental health functioning of rural and urban youth. High quality wraparound practice, reflected in high fidelity scores, predicts statistically significant improvement in youth needs, especially youth who begin intensive community based services with high levels of behavioral health symptoms in both rural and urban communities. Although the effect size of this study is small, it is consistent with the significant, but relatively small effect sizes for mental health (.31) and overall functioning (.25) found in Suter and Bruns' (2009) meta-analysis of the wraparound literature.

The absence of disparities in outcomes related to demographic factors or community is also promising. Furthermore, wraparound is a feasible approach to provide effective intervention and support with bachelor and graduate level social workers (Bruns et al., 2008). Additional research is needed to better understand which specific behavioral health needs are more likely to improve, and how targeted evidenced practices can be integrated with the wraparound model. Separate models can identify variables related to other outcomes (e.g., youth strengths and improving caregiver's abilities to meet the needs and support the development of their children).

Using relatively simple statistical approaches provides clues to better understand relationships among complicated factors involved in providing effective rural behavioral health services for youth, but has inherent limitations. The use of a purposive non-random sample prohibits generalizability to any youth not involved in grant services. To improve generalizability, the use of propensity score matching to identify a control group of youth who receive only usual treatment, including PRTF services could result in a quasi-experimental design with more conclusive results (Grimes et al., 2011). At this time, available data is not suitable for this research strategy.

The rural/urban dichotomy limits understanding of potential geographic implications. The U.S. Census Bureau (2002) suggests the use of urban clusters as a third geographic category. Urban clusters refer to any area having a population density of at least 1,000 people per square mile (U.S. Census Bureau, 2002). Although information was not available to accurately identify urban clusters, future research will attempt to refine the geographic measure to analyze proximity to resources (Weiner et al., 2011).

The future use of urban clusters would have two major benefits. First, there are several rural counties in Indiana that do have larger cities with access to social service resources. However, these cities along with other cities in the county do not exceed the 50,000 population parameter to have an urban classification. Second, there are many urban counties that have only one large city accounting for a vast majority of the population. Outside of that city, there is limited access and availability to resources. Using urban clusters would allow the researchers to control for proximity to resources, which would provide a refined examination of access and availability to mental health services across Indiana.

Future research needs to examine the following: (a) which behavioral health needs are responsive to high quality wraparound services; (b) which elements, phases, or activities of the wraparound process are related to outcomes; (c) what would be the impact of adding targeted evidence based treatment; and (d) given emerging evidence of the small effect size for wraparound's relationship to improvement, what other factors are related to improvement for youth with complex behavioral health needs.

Quasi-experimental designs, adding comparison group(s), while incorporating fidelity, multiple outcome measures, and consistent monitoring of possible disparities related to demographic characteristics or geography, would bolster the quality of evidence and help better explain the complex child behavioral health service delivery system. Models built on emerging research and theories of change would further strengthen the research base. Emerging information can help social workers and other rural practitioners identify feasible models of practice to increase effective mental health services.

Conclusion

For youth with complex behavioral health needs, community based services coordinated through a high quality wraparound process can work equally well in both urban and rural communities. Effectively implementing the wraparound process is a feasible strategy to reduce disparities in behavioral health outcomes for youth with complex needs in rural communities.

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