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An Evaluation of an Interdisciplinary Rural School Mental Health Programme in Appalachia

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School mental health (SMH) programmes serve as a necessary niche within rural communities and aim to bring accessible care to youth who may otherwise go without mental health services. The following study evaluated the impact of mental health treatment provided by the Assessment, Support, and Counseling (ASC) Center, an SMH health initiative located within a high school in rural western North Carolina during the 2011 – 2012 school year. Participants were high school students between 14 and 18 years of age, predominately Caucasian (91.3%) and female (65.5%). Treatment was evaluated based on score change on the Youth Outcome Questionnaire using the reliable change index (RCI; Jacobson & Truax, 1991) to track changes in symptomatology. Following ASC Center treatment, 63% of the clinical sample was deemed to have improved or recovered based on the RCI. While the study did not use an experimental design (with associated cautions regarding interpretation of findings), the results suggest that a moderate dosage of cognitive-behavioural therapy provided to adolescents in the context of a rural SMH programme is associated with reliable change for the majority of youth who take part in the treatment.

Keywords: school mental health; rural; interdisciplinary; cognitive-behavioural therapy

In order to address the mental health needs of adolescents in rural settings, treatment providers need opportunities and tools designed to navigate around the known barriers to treatment seeking in remote regions. For instance, transportation limitations, stigma surrounding psychotherapy, financial concerns (i.e. uninsured, underinsured), dearth of available providers, and other barriers often prevent adolescents from receiving the care they need in order to function adequately (Owens, Watabe, & Michael, 2013). These barriers to treatment seeking coupled with the relatively higher prevalence of certain problems (e.g. depression, suicide, substance abuse) in rural settings (Eberhardt & Pamuk, 2004; Matthew & West, 2011) provide a compelling rationale to develop and test feasible and effective service models for youth in these areas.

Effectively treating adolescent mental health issues in rural communities is further complicated by the lack of qualified professionals and available resources within a reasonable distance from home (Gamm, Stone, & Pittman, 2003; Owens et al., 2013). This places a heavier burden on school professionals who are in contact with adolescents on a daily basis, but who are also limited by the time they have to devote to individual students (Macklem, 2011; Michael, Renkert, Wandler, & Stamey, 2009; Owens et al., 2013). Indeed, Lyneham & Rapee (2007) examined help-seeking behaviour among Australian

families with children who were experiencing emotional or behavioural problems and found that those in rural settings relied most heavily on school counsellors as the primary entry point (more than twice as often as the next most common provider), whereas a specialist (e.g. paediatrician, psychologist) was more likely to be sought for those who lived in urban regions. Thus, one potential solution given the aforementioned factors is to provide access to effective mental health services for adolescents in rural areas by utilizing the existing platform of the public school system as an entry point for intervention in tandem with community or university partners who are the direct service providers to avoid overburdening school professionals (e.g. Flaherty, Weist, & Warner, 1996; Zirkelback & Reese, 2010).

School mental health programmes

School mental health (SMH) programmes for adolescents seek not only to provide quality mental health care for young people, but also to reduce some of the barriers that prevent services from being utilized (Zirkelback & Reese, 2010). For example, if a rural family is hesitant about participating in mental health services with local community providers, having a programme set up at the local school may be seen as a feasible option that reduces stress or embarrassment they may feel due to transportation issues, financial difficulties, or the stigma associated with receiving mental health services (Owens et al., 2013). Rural school systems are typically sensitive to the needs of their community members and might view SMH programmes as a way to ensure that adolescents have access to adequate professional help they need (Swannell, Hand, & Martin, 2009). This not only addresses the barrier of finding and making resources available to students in need, but also can also provide cost-effective methods of treatment that would otherwise not be available (Flaherty et al., 1996). While providing rural school systems with effective, broad-based SMH programmes for its students is defensible, the research available to support such endeavours is underdeveloped.

Nonetheless, there are several studies that demonstrate support for the use of SMH programmes overall. One study found that SMH services were effective in reducing internalizing and externalizing problematic behaviours, as well as providing protective factors associated with symptoms of emotional distress (Fox et al., 1999). Similarly, Sander, Everts, and Johnson (2011) examined SMH programmes in the Minneapolis Public Schools system and found that parent and teacher ratings of students indicated significant decreases in emotional and behavioural symptoms.

SMH programmes have also been shown to be effective in treating depression in adolescents (Reynolds & Coats, 1986), increasing positive self-esteem (Kahn, Kehle, Jensen, & Clark, 1990), reducing anxiety and depression stemming from bullying (Berry & Hunt, 2009), and increasing positive social behaviours such as frequent dating and better family functioning (Mufson et al., 2004). In addition, the evidence from SMH programme evaluations supports the finding that students who receive services perform better academically (Everts, 2011; Fox et al., 1999; Sander et al., 2011). Regardless of the targeted outcome, mental health programmes within the school milieu designed to address a wide array of mental health needs have found moderate to large effect sizes overall in reducing problematic behaviours (Baskin, Slaten, Crosby et al., 2010; Baskin, Slaten, Sorenson, Glover-Russell, & Merson, 2010; Prout & DeMartino, 1986; Prout & Prout, 1998).

As described above, the need to document effective adolescent SMH services within rural communities is the major impetus for this paper. One region affected by these public health issues is western North Carolina. Based on recent data compiled by Matthew &

West (2011) from a local version of the Youth Risk Behavior Survey, a national survey aimed at measuring a variety of risk behaviours among middle and high school students (Centers for Disease Control & Prevention, 2013), rates of teenage suicide and depressive symptomology in this area are commensurate with national averages that show high levels of problem behaviours. Indeed, the local survey found that approximately 25.7% of high school students in Watauga County were sad or depressed for at least two weeks at a time in the year prior to the survey. Furthermore, 14.9% seriously considered suicide during the previous 12 months, 12.4% had made a plan to commit suicide, and 4.3% had made a suicide attempt that required medical intervention during the previous year (Matthew & West, 2011). Between 2004 and 2008, the Watauga County completed suicide rate was 15.9 per 100,000 people, compared to the state average of 11.9 per 100,000 for the same time period (North Carolina State Center for Health Statistics, 2009).

In response to this need, the Assessment, Support, and Counseling (ASC) Center was developed and implemented during the 2006–2007 academic year in a rural school in western North Carolina. This programme, developed by partners from Appalachian State University (ASU), Watauga High School, and the Watauga Board of Education, provides individualized outpatient mental health services to adolescents in need within the school environment (Michael et al., 2009). The ASC Center uses an interdisciplinary approach to providing services to students, drawing on various mental health perspectives (psychology, social work, marriage, and family therapy), school administration, local community agencies, and law enforcement (Michael, Bernstein, Owens, Albright, & Anderson-Butcher, in press). The ASC Center endeavours to address many of the previously mentioned barriers to treatment facing rural communities, including reducing transportation issues, stigma associated with receiving services, and cost of treatment given that services are provided at no expense to the students or their families. Furthermore, this programme serves as a training environment for the graduate school programmes at ASU under the supervision of licensed, doctoral-level clinicians (Michael et al., 2009; Michael, Renkert, Winek, & Massey, 2010).

Evaluating SMH programmes

One challenge in evaluating SMH programmes is determining the best way to measure outcomes. One well-established and psychometrically sound measure of treatment response is called *clinically significant change* (Jacobson & Truax, 1991). Jacobson & Truax (1991) established a method for evaluating whether clinically significant change has occurred by utilizing a two-part criterion, or reliable change index (RCI). First, the client must begin treatment with symptom levels that meet or exceed established cut-offs for clinically elevated difficulties and end up in the 'non-clinical' range at post-treatment. The cut-off for a particular measure is defined as a score on the measure that falls between the functional and dysfunctional populations. According to Jacobson & Truax (1991), there are three potential cut-off scores. 'Cut-off A' is defined as below the mean of the dysfunctional population, 'Cut-off B' is the point just within two standard deviations greater than the functional population mean, whereas 'Cut-off C' is the weighted mid-point between the means of functional and dysfunctional samples. According to Jacobson, Roberts, Berns, and McGlinchey (1999), 'Cutoff C' is the best choice when assessing clinically significant change since it is the least arbitrary.

The second part of the two-part criterion is that the amount of change or movement must be sufficient enough to suggest that reliable change has occurred, as opposed to random fluctuations or measurement error. To reflect this, Jacobson, Follette, and Revenstorf (1984; as later revised by Christensen & Mendoza, 1986) recommend computing an RCI

for each individual. The RCI is the difference between an individual's pretest score and his or her post-test score, adjusted for the standard error of the difference between the scores (denominator). The RCI is based on a standardized metric, and Jacobson & Truax (1991) suggest that if the amount of change observed exceeds a particular threshold (i.e. z-value 1.96, two-tailed) at the desired level of significance ($p < 0.05$), then he or she has shown 'reliable change'. The RCI is two-tailed, given that it is possible for clients to improve or worsen, as a result of the intervention (Lilienfeld, 2007). From this tradition, individuals who meet both criteria are considered 'recovered' – that is, they have moved from a score in a clinical range to a score in a non-clinical range, and they evidence a 'reliable' amount of change. In addition, there are several delineations of the 'non-recovered' individuals. Specifically, individuals who show evidence of a sufficient amount of change but who do not move from a clinical to non-clinical range are considered 'improved', those who meet neither criterion are considered 'unchanged', and for those individuals where the symptoms worsen, they are considered 'deteriorated'. The validity of the clinically significant change procedures has been tested in several studies (Anderson & Lambert, 2001; Burgess, Pirkis,

& Coombs, 2009; Eisen, Ranganathan, Seal, & Spiro, 2007; Ferguson, Robinson, & Splaine, 2002) that suggest it is an effective method of evaluating symptomatic improvement across several dependent measures of outcome.

In the present study, reliable change of symptom reduction following treatment was examined using the Youth Outcome Questionnaire-30 (YOQ) in a sample of adolescents who received ASC Center services, a broad-based SMH programme in rural western North Carolina. The established cut-off for clinical significance for the YOQ-30 is a total score of 29 or higher, and the established amount of change in the total score necessary to qualify for reliable change is a decrease of 10 points (Burlingame et al., 2004).

Method

Participants

Participants ($N = 64$) were students between 14 and 18 years old ($M = 16.3$; $SD = 1.19$) who were referred for and received individual treatment at the ASC Center, an SMH programme in a rural high school in western North Carolina. The students (base rate $= 4.4\%$ of student body) were referred by professional school counsellors to the ASC Center during the 2011–2012 school year. Ninety-one per cent of the participants were Caucasian/non-Latino ($n = 53$), with 5% African American ($n = 3$) and 3% Latino/Latina ($n = 2$). Sixty-six per cent of the sample was female. The demographics of the treated sample were consistent with the overall population demographics where the current study took place. Of the 64 referred students over the course of the school year, 58 were deemed eligible for the analyses, given that they were administered two or more valid YOQs during their active involvement in treatment. Among the 58 referrals, 66% ($n = 38$) of the sample met clinical criteria (i.e. cut-off score of 29 or higher) as measured by the YOQ. Once deemed eligible based on YOQ data, no other students were excluded from the main RCI analyses.

Procedure

Students and their families who elected to receive ASC Center services provided full informed consent and assent to participate in treatment as well as an additional consent and assent procedure, agreeing to participate in the research. Approval was granted by ASU's Institutional Review Board on 21 April 2011. Prior to the start of treatment, assessments were administered to the students by a clinician not assigned as the primary therapist to

collect baseline data. Subsequent assessments were completed at the appropriate intervals (i.e. before individual sessions, post-treatment, and follow-up). Post-treatment assess- ments were administered at the end of the 2011–2012 school year, or at case closure if treatment was discontinued prior to the end of the school year. In the case that students were referred to the ASC Center at the end of the school year, post-treatment assessments were administered only if the student was seen for four or more individual sessions. Follow-up academic data were collected at the end of the fall 2012 semester, or approximately six months following post-treatment assessments.

Each student received weekly individual therapy. The type of treatment provided was primarily non-manualized, cognitive-behavioural therapy (CBT) coupled with crisis and case management as deemed appropriate for each individual case. CBT treatment was tailored for each student and in consultation with each therapist's clinical supervisor (71% of the cases were supervised by a licensed psychologist) with a predominant CBT orientation. The treatment elements included but were not limited to psychoeducation, mood monitoring, identification of cognitive distortions, cognitive restructuring, behavioural activation, activity scheduling, exposure, relaxation training, problem- solving, and self-monitoring procedures.

There were a total of eight clinicians who provided treatment in the study and who were from various disciplines. Specifically, there were four graduate students in Clinical Health Psychology, one graduate student in Clinical Social Work, one graduate student in Marriage and Family Therapy, one master's level psychologist, and one Licensed Clinical School Social Worker. Clinicians were 88% female. The one male clinician was a graduate student clinician in Clinical Health Psychology. Clinicians with psychological training provided treatment to 71% of the sample, social work clinicians provided treatment to 16% of the sample, and the Marriage and Family Therapy trained clinician met with 13% of the total sample. In addition to 1 hour of weekly individual supervision, the therapists met weekly for an average of 2 hours and received group supervision and consultation from the ASC team, which included three doctoral-level, licensed faculty (psychologist, clinical social worker, and marriage and family therapist). Moreover, additional supervision was provided as needed when students experienced crises or when case management needs arose.

Measures

Behavioural Assessment System for Children-2 (BASC-2)

To assess the emotional, behavioural, and adaptive functioning of the participants, the Behavioural Assessment System for Children – second edition (BASC-2; Reynolds & Kamphaus, 2004) Self-Report of Personality-Adolescent (SRP-A) and Parent Rating Scale-Adolescent (PRS-A) versions were used. The BASC-2 is a multi-observer measure of behavioural functioning in youth that has clinical, adaptive, broadband, and narrowband subscales. Responders were asked to answer questions about emotional and behavioural functioning as they applied to the individual. On the SRP-A, some questions are rated on a dichotomous true or false format, whereas other questions are rated on a four-point Likert scale of *never*, *sometimes*, *often*, and *almost always* true of the individual. The SRP-A and PRS-A were administered at the time of intake and at case closure or at the end of the semester.

The BASC-2 has been tested with the target population with a large sample of children representative of the normal population. The PRS-A and SRP-A forms exhibit high internal consistency on the composite scales (*a* ¼ 0.84–0.96). The test–retest reliabilities are adequate to good for both the SRP-A (low 0.70s–low 0.90s) and the PRS-A

(low 0.70s–low 0.80s). There is modest support in the literature for using the BASC-2 as a reasonably sensitive measure of outcome (McClendon et al., 2011). In addition, the BASC-2 has been used in other studies as an outcome measure to assess symptom outcomes following school-based psychotherapy (e.g. Evans, Serpell, Schultz, & Pastor, 2007). The BASC-2 was used in the current study to compare the changes in T-score elevations on BASC-2 broadband scales at baseline administration versus post-treatment administration. More specifically, the number of students who presented with two or more clinically significant elevations (i.e. _ 2 SDs above the mean) at baseline and final administrations and the number of students with zero elevations at baseline and final administrations were highlighted.

Youth Outcome Questionnaire-30 (YOQ-30)

To assess students' response to ASC Center services, the YOQ-30 was administered at baseline and the beginning of at least every other session with the student. The 30 items on the YOQ-30 were selected by the test developers from the longer 64-item version, 'based on their sensitivity to change as estimated from a large scale study of patients undergoing treatment in a variety of settings' (Burlingame et al., 2004, p. 2). Thus, the shorter version was selected due to its efficiency coupled with its documented sensitivity to change. The YOQ-30 measures concerns and symptoms across problem types and disorders (e.g. mood disorders, anxiety disorders, conduct problems, attention problems, interpersonal concerns) as experienced by the adolescent over the previous seven days. The items are rated on a five-point Likert scale with zero indicating *never* and four indicating *always* or *almost always*. The measure has been found to be highly sensitive to change that takes place over the course of treatment (Burlingame et al., 2004). While subscales are available for scoring the YOQ-30, according to Burlingame et al. (2004) the total score is the most sensitive to tracking change and has strong psychometric features. The YOQ-30 was normed on a relatively large sample (N ¼ 530) and includes data on community and outpatient mental health samples. The YOQ has high internal consistency for community normative samples (a ¼ 0.92) and outpatient normative samples (a ¼ 0.93).

As described above, the established cut-off for clinical significance for the YOQ-30 is a total score of 29 or higher. The established amount of change in the total score necessary to qualify for reliable change is a decrease of 10 points (Burlingame et al., 2004). These benchmarks were used in the present study.

Results

Descriptive statistics

The average number of sessions among participants was 14.88, SD ¼ 8.56. The average therapy dosage provided for the total sample was 607.05 therapy minutes (SD ¼ 383.65), and each participant received approximately 40.79 min per session. Participants were involved with ASC Center services for an average of 20.03 weeks (SD ¼ 11.24). The total number of sessions of participants with scores in the clinically significant range (n ¼ 38) was 581, M ¼ 15.29 sessions (SD ¼ 9.25). These participants received an average of 654.81 minutes in therapy (SD ¼ 426.67), resulting in approximately 42.82 minutes per session, and were involved in treatment for an average of 18.89 weeks (SD ¼ 10.70) during the 2011–2012 school year. The average number of sessions for participants that began treatment with YOQ scores below the clinical cut-off score (n ¼ 20) was 14.35 (SD

¼ 7.23). These participants received an average dosage of 518.7 minutes in therapy (SD ¼ 276.09). The subclinical subgroup received approximately 36.15 minutes per session. These participants were involved in ASC Center services for an average of 22.2 weeks (SD ¼ 12.20). Session durations varied depending on the student's attendance in school, as well as teacher and school personnel's parameters for allowing individual students to miss class time. Students were typically seen for approximately half of one class each week, or on an as-needed basis when students were in crisis or they requested to be seen. Weeks in treatment also varied as a function of when they were referred and in some cases the length of treatment was impacted by uncontrollable factors (e.g. inclement weather during second semester).

BASC-2

Students who scored in the clinically significant range ($T \geq 70$) on the BASC broadband scales were said to have clinically significant elevations in that area. At baseline, 28% of the sample presented with two or more clinically significant broadband scales on the self- report BASC-2. At post-treatment, 20% of the sample had two or more clinically significant broadband elevations. Fifty-five per cent of the sample presented for treatment with no clinically significant broadband elevations. At final assessment, 74% of the sample had zero clinically significant broadband elevations on the self-report version of the BASC-2. See Table 1 for a summary of the clinically significant self-reported broadband elevations at baseline and final assessment.

At baseline, 22% of parent report forms of the BASC-2 indicated that students experienced clinically significant levels of distress on two or more broadband scales. Seven per cent of parents indicated that their child was elevated on two or more broadband scales at final assessment. Fifty-nine per cent of parents reported that their child experienced zero clinically significant broadband elevations at baseline. At final assessment, 74% of parents indicated that their child had zero clinically significant broadband elevations (see Table 2).

Table 1. BASC-2 clinically significant self-report broadband scales at baseline and final assessment.

EBASC-2 SRP scale	Baseline (N ¼ 58)	Post-treatment (N ¼ 50)
Internalizing problems	3/58 (5%)	0
Clinical	3/38 (8%)	0
Non-clinical	0	0
Inattention/hyperactivity	4/58 (7%)	1/50 (2%)
Clinical	4/38 (10%)	1/32 (3%)
Non-clinical	0	0
Emotional symptoms index	1/58 (2%)	1/50 (2%)
Clinical	0	0
Non-clinical	1/20 (5%)	1/16 (6%)
Personal adjustment	2/58 (3%)	1/50 (2%)
Clinical	1/38 (3%)	0
Non-clinical	1/20 (5%)	1/16 (6%)
Two þ elevations	16/58 (28%)	10/50 (20%)
Clinical	16/38 (42%)	10/32 (31%)
Non-clinical	0	0
Zero elevations	32/58 (55%)	37/50 (74%)
Clinical	14/38 (37%)	21/32 (66%)
Non-clinical	18/20 (90%)	14/16 (88%)
Number of SRP reports received	58/58 (100%)	50/58 (86%)

Table 2. BASC-2 clinically significant parent-report broadband scales at baseline and final assessment.

BASC-2 PRS scale	Baseline N ¼ 37	Post-treatment N ¼ 27
Externalizing problems	1/37 (3%)	1/27 (4%)
Clinical	1/27 (4%)	1/16 (6%)
Non-clinical	0	0
Internalizing problems	5/37 (13%)	3/27 (11%)
Clinical	3/27 (11%)	1/16 (6%)
Non-clinical	2/10 (20%)	2/11 (18%)
Behavioural symptoms index	0	1/27 (4%)
Clinical	0	0
Non-clinical	0	1/11 (9%)
Adaptive skills	1/37 (3%)	0
Clinical	1/37 (4%)	0
Non-clinical	0	0
Two þ elevations	8/37 (22%)	2/27 (7%)
Clinical	7/27 (26%)	2/16 (13%)
Non-clinical	1/10 (10%)	0
Zero elevations	22/37 (59%)	20/27 (74%)
Clinical	15/27 (55%)	12/16 (75%)
Non-clinical	7/10 (70%)	8/11 (73%)
Number of PRS reports received	37/58 (64%)	27/58 (47%)

YOQ-30

The mean baseline YOQ score for all individuals that qualified for the study was 36.97 (SD ¼ 18.71). The mean of the final score taken at termination of treatment for all participants was 23.31 (SD ¼ 20.07). Sixty-six per cent (n ¼ 38) of the 58 participants scored within the clinical range of the YOQ at baseline (i.e. $ 29) with 20 participants falling within the subclinical range (i.e. #28). Of the 38 clinical participants, 95% were Caucasian (n ¼ 36), 5% African American (n ¼ 1) or Hispanic (n ¼ 1). Sixty-one per cent of the clinically significant group was female (n ¼ 23). The mean baseline YOQ score for those that began treatment above the cut-off score (n ¼ 38) was 47.26 (SD ¼ 13.83). For the subclinical group, the mean baseline YOQ score was 17.40 (SD ¼ 7.90).
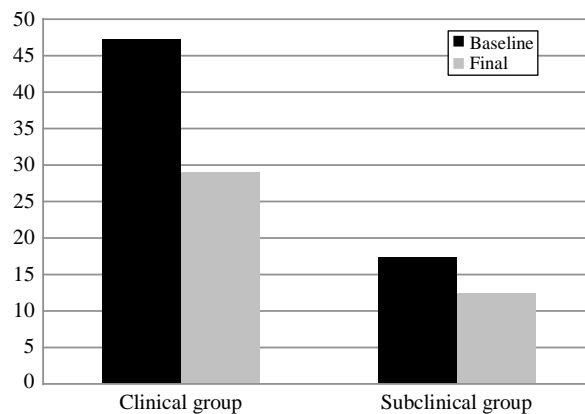

Figure 1. Average total YOQ-30 scores at baseline and final assessment for the clinical group (n ¼ 38) and the subclinical group (n ¼ 20).

The average final YOQ score at post-treatment for those that began above the clinical cut-off score was 29.03 (SD ¼ 20.23). The mean final YOQ for participants that began below the cut-off score was 12.45 (SD ¼ 14.89). See Figure 1 for the clinical and subclinical baseline and final mean YOQ-30 scores.

Main effects

At post-treatment, 78% of the sample had lower YOQ scores when compared to baseline levels. The total sample exhibited an average reduction of 20.29 points (SD ¼ 13.99; range ¼ 2–56) from baseline to final assessment. Twenty-two per cent of the sample demonstrated an average increase of 9.31 points (SD ¼ 7.12; range ¼ 1–23) on the final YOQ administration.

Of the participants who presented with clinically significant scores on the baseline YOQ, 45% (*n* ¼ 17) 'recovered' at the end of the treatment period using the RCI guidelines as described by Jacobson & Truax (1991). Eighteen per cent (*n* ¼ 7) of the participants that began at clinical significance were observed to drop 10 or more points, but remained above the clinically significant cut-off score. Thus, these individuals were deemed 'improved' rather than 'recovered'. Those students who began services in the clinical range but did not experience a reliable amount of change were classified as 'unchanged'. Thirty-two per cent (*n* ¼ 12) of the clinically significant population (*n* ¼ 38) fell into the 'unchanged' category at post-treatment. Participants who began treatment at clinically significant levels and demonstrated at least a 10-point increase in symptoms were classified as 'deteriorated'. Of the 38 participants who began treatment in the dysfunctional range, two participants (5%) evidenced at least a 10-point increase in symptoms at post-treatment. In addition, of the 20 students who began services at subclinical levels, three students demonstrated at least a 10-point increase in symptoms, which placed them in the dysfunctional population at post-treatment and were thus considered 'deteriorated' (Jacobson et al., 1984, 1999; Jacobson & Truax, 1991).

Measure overlap

More specifically, among those students who presented for treatment with total YOQ scores of ̲ 29, 42% fell within the clinically significant range on two or more self- reported broadband scales at baseline. Thirty-seven per cent of the clinically significant YOQ subgroup began treatment with zero clinically significant elevations on any of the BASC-2 self-report broadband scales. At post-treatment, 31% of the clinical YOQ group had two or more clinically significant self-report BASC-2 broadband scales. Sixty-six per cent of those in the clinical YOQ group had zero clinically significant symptoms on the BASC-2 self-report broadband scales at final assessment. Among those students who began services at subclinical levels of symptoms as measured by YOQ (*n* ¼ 20), 90% did not report any clinically significant symptoms as detected by broadband scale elevations at baseline assessment. At post-treatment, 88% of the subclinical group reported zero clinically significant elevations on the broadband scales (see Table 1).

At baseline, the parent report BASC-2 indicated that 26% of the clinical YOQ group experienced clinically significant levels of distress on two or more broadband scales. Fifty- five per cent of parent report BASC-2 reported zero clinically significant broadband elevations at baseline among the clinical YOQ group. At final assessment, 13% of parent report BASC-2 forms indicated two or more clinically significant broadband scales among the clinical YOQ group. Seventy-five per cent of parent report forms indicated zero broadband scale elevations at final assessment among the clinical YOQ group (see Table 2).

Among those students in the subclinical YOQ group, 10% of the parent report form of the BASC-2 indicated two or more clinically significant broadband scales at baseline. Seventy per cent of the parent BASC-2 reported zero clinically significant broadband scale elevations at baseline. At final assessment, none of the parent report forms indicated that students in the subclinical YOQ group experienced two or more clinically significant broadband elevations. Seventy-three per cent of the parent BASC-2 form indicated zero clinically significant broadband elevations among the subclinical YOQ group at final assessment (see Table 2).

Discussion

The effectiveness of a rural SMH programme for a sample of adolescents in Appalachia was examined in the present study. Overall, the majority (78%) of the adolescents exhibited less psychological distress during the final assessment compared to their scores at baseline. The average dosage of treatment was moderate (approximately 15 sessions of CBT) over a 20-week period. Among the participants who exhibited clinically significant symptoms at baseline, 63% were deemed 'recovered' or 'improved' at post-treatment based on the RCI guidelines as described by Jacobson & Truax (1991). These results are commensurate with large randomized controlled trials for particular conditions such as child and adolescent anxiety (Walkup et al., 2008) and adolescent depression (The TADS Team, 2007). For instance, Walkup et al. implemented approximately 14 sessions of CBT in one arm of the study and 59.7% of the youth were deemed 'improved' at post-treatment (within subjects effects). Similarly, among the adolescents who received 12 – 18 sessions of CBT in the TADS study, 65% were deemed 'improved' after 18 weeks of treatment (TADS, 2007), also a within-subjects finding comparable to the RCI findings described above. Thus, although the focus of treatment in the present study was not limited to specific conditions, the type of intervention, dosage, and longevity resulted in similar outcomes for the youth being served. Moreover, these results were achieved in the context of a rural, interdisciplinary SMH programme wherein graduate students under supervision served as the primary clinicians. The use of graduate students and the rural context of the study add to the literature by testing whether treatment elements found in randomized controlled trials are transportable to real-world community practice settings.

Similar improvements were observed from the BASC-2. Results from the self-report showed that 66% of ASC clients in the clinical group ended treatment with zero broadband scale elevations, compared to only 37% at baseline. Furthermore, there were fewer (31%) participants from the clinical group that had two or more broadband scale elevations at post- treatment, compared to 42% at baseline. These findings were corroborated by the parent report data, given that 75% of the clinical group ended treatment with zero broadband scale elevations compared to 55% at baseline. In addition, the parent report data showed that only 13% of the clinical group ended treatment with two or more broadband scale elevations, compared to 26% at baseline.

Overall, these results suggest that the ASC Center model is an effective means to treat adolescents across a broad array of concerns and problems in the context of a rural high school. These findings are among the first to document the benefits of a broad-based, interdisciplinary SMH programme in a rural setting. Moreover, these results were achieved in a rural community milieu utilizing scientifically supported treatment components from CBT. Thus, although the gold standard in psychotherapy research is testing hypotheses via large randomized controlled trials, the current study might have at least added a small step towards bridging the gap between science and practice by using appropriate benchmarks

(i.e. RCI) to test the effects of community-based interventions. Indeed, the services provided by ASC Center clinicians demonstrate the success and practicality of implementing scientifically supported elements of CBT in a community rural setting, yielding success rates commensurate with large randomized controlled trials (e.g. TADS, 2007; Walkup et al., 2008).

Another important feature of the study is the fact that the large majority (75%) of the clinicians were graduate students under supervision. The supervision consisted of discipline-specific oversight as well as interdisciplinary group supervision on a weekly basis. Thus, models such as these, that place an emphasis on accountability in the form of research evaluation (e.g. McQuaid & Spirito, 2012) and employing evidence-based methods in clinical applications (Hershenberg, Drabick, & Vivian, 2012), might hold promise for developing and training a steady stream of scientist-practitioners in SMH for years to come. Interestingly, the use of graduate students in psychotherapy studies is not without its sceptics (see Christensen & Jacobson, 1994, for a review). Nonetheless, the data suggest that graduate students under supervision are often just as effective as doctoral-level providers for a variety of conditions (e.g. depression; Michael, Huelsman,
& Crowley, 2005). Moreover, using graduate student clinicians as primary therapists provides an innovative 'quid pro quo' by providing cost-effective services to students and families in need while simultaneously increasing and improving the SMH workforce, both locally and on a broader scale.

In addition to utilizing graduate student clinicians, the ASC Center model includes regular (weekly) interdisciplinary collaboration. That is, the ASC Center team is comprised of graduate students and practitioners from a variety of traditionally disparate mental health fields (e.g. social work, marriage and family therapy, psychology, school counselling, school resource/law enforcement, school administration), all of whom organize around a shared agenda of providing effective services to the youth within the school. The weekly discussions were non-hierarchical and provided diverse viewpoints on conceptualization and treatment (Michael et al., in press). While the majority (71%) of cases were treated and supervised primarily by a doctoral-level clinical psychologist, weekly interdisciplinary staff meetings provided the context for developing a broader, more comprehensive treatment approach. Thus, the results presented here provide a promising glimpse of the value and effectiveness of interdisciplinary SMH.

Limitations and future directions

There were three notable limitations from the study. The first obvious limitation is that the study did not include an experimental design; hence, causal conclusions about changes in students' symptoms cannot be made. Because the study utilized a within-subjects design, historical or extraneous variables cannot be ruled out as potential influences on the outcomes. The use of a comparison group would have strengthened the results, and future research from the ASC Center aims to integrate a control condition to better understand the impact of treatment on these important outcomes. Despite this limitation, it will be increasingly important to document the effects of interventions using appropriate methods and benchmarks (e.g. RCI) and continue to expand the outcome research to include practice-based evidence as a regular feature in the literature. For example, Clement (2013) has consistently demonstrated a commitment to measuring what happens in community clinical practice for decades and the results published provide a compelling rationale to adopt this empirical approach across clinical sites before, during, and after RCTs have been completed and disseminated.

Second, the weekly administration of the YOQ was challenging and inconsistent at times. That is, clinicians often gave the YOQ on a less consistent basis, rather than every week as was planned. Furthermore, when students were in crisis or in extreme distress at the time of the session, the YOQ was often not administered as to preserve the rapport of the therapist and the student. Thus, although pre- and post-treatment assessments of the YOQ were the minimum required to calculate an RCI, more consistent YOQ administrations throughout treatment may have allowed for better symptom tracking over time. In addition, if we had a larger number of YOQ administrations for the entire sample, a clearer picture of the dosage required to achieve an even higher rate of 'improved' or 'recovered' participants would have been more feasible. Future studies will aim to collect more consistent YOQ data in order to more precisely monitor changes in symptoms over time.

Third, while youth have been found to be reliable reporters of their symptoms (e.g. Michael & Merrell, 1998), the modest return rates from the post-treatment parent report BASC-2 might lead us to temper our interpretations of symptom change across multiple observers. The return rates were modest even after considerable efforts were made (e.g. multiple individual phone calls) to increase the response rate. The majority of parents who were contacted asked for the questionnaire to be mailed. The questionnaires were mailed with instructions for completion, along with addressed and stamped return envelopes. If the questionnaires were not returned following a two- to three-week time period, the parents were contacted again and reminded to complete the questionnaire, or provided with another copy in the instance that the previous form was misplaced. Follow-up efforts at collecting parent data will need to take these limitations into account when evaluating the effectiveness of ASC Center in future studies.

In closing, it appears that a moderate dosage of CBT provided to adolescents in the context of a rural SMH programme is associated with reliable change for the majority of youth who took part in the treatment. These promising findings are coupled with the fact that the results were achieved within an interdisciplinary SMH model and that graduate students under supervision served as the primary clinicians, offering hope for a feasible and effective model of SMH service delivery for students in rural settings.

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