

Review: Comprehensive treatments for youth comorbidity – evidence-guided approaches to a complicated problem

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Background: Evidence-based treatments (EBTs) with a single-disorder focus have improved the potential for youth mental health care, yet may be an imperfect fit to clinical care settings where diagnostic comorbidity and co-occurring problems are commonplace. Most EBTs were developed to treat one diagnosis or problem (or a small homogenous cluster), but most clinically referred youths present with multiple disorders and problems. **Findings:** Three emerging approaches may help address the comorbidity that is so common in treated youths. Conceptually unified treatments target presumed causal and maintaining factors that are shared among more than one disorder or problem area; preliminary open trials and case studies show promising results. Modular protocols combine the ‘practice elements’ that commonly appear in separate single-disorder EBTs and repackage them into coordinated delivery systems; one modular protocol, MATCH, has produced positive findings in a randomized effectiveness trial. Monitoring and Feedback Systems (MFSs) provide real-time data on client progress to inform clinical decision-making, encompassing comorbid and co-occurring problems; one study shows beneficial effects in everyday practice with diverse youth problems. **Conclusions:** All three approaches – conceptually unified, modular, and MFS – can be strengthened by increased research attention to treatment integrity, clinician user-appeal, design simplicity, and the infrastructure necessary for successful implementation.

Key Practitioner Message

- Most evidence-based treatments (EBTs) for youths were developed to treat a single target disorder or problem domain, or a homogenous cluster, but most clinically referred youths present with multiple disorders and problems.
- When client comorbidity is not directly addressed by EBTs, clinicians may be left without evidence-based guidance. To address this gap, three approaches warrant attention.
- Unified manuals that address presumed causal and maintaining factors of more than one disorder may be of value, particularly for problems with shared theoretical and empirical literatures.
- Modular approaches to EBTs may be an effective way for clinicians to treat multi-problem and comorbid youths, even those with conceptually distinct conditions, and one approach, MATCH, has been found to be effective in a randomized trial.
- Monitoring and feedback systems provide real-time case-specific evidence that can guide the clinical decision-making required in treating comorbid clients, regardless of the treatment approach employed.

Keywords: Intervention; psychology; comorbidity

Introduction

Best practice in mental health care is increasingly defined in terms of empirically tested ‘evidence-based treatments’ (EBTs). Maximizing patient access to EBTs has become a dominant public health concern (e.g. Institute of Medicine, 2001, 2007). In the area of youth psychosocial interventions, scores of treatments have been tested in randomized clinical trials (RCTs) and shown to be efficacious (Chorpita et al., 2011; NREPP, 2014; Silverman & Hinshaw, 2008). Major government initiatives within the United Kingdom, the United States, and

beyond have focused efforts on increasing the adoption, dissemination, and implementation of treatments with proven benefit (see McHugh & Barlow, 2010; for an overview). As noted by Kaysen, Lindgren, and Rao (2014), the field of mental health has never had more information about effective psychotherapies for a broad array of diagnoses and problems; paradoxically, most youths in need will never receive a treatment informed by this science. A number of factors may contribute to this conundrum – among them, differences between the conditions under which treatments are developed and tested and the conditions for which they are ultimately intended. One

important example of the mismatch between research and practice is the distinction between the single-disorder treatment targets of most EBTs, on the one hand, and the high rates of comorbidity among clients treated in public mental health services, on the other.

Although the vast majority of tested treatments, hereafter called ‘single-disorder EBTs’, focus on one disorder of interest (e.g. generalized anxiety disorder), or one ‘family’ of dysfunction (e.g. anxiety disorders) (Chorpita et al., 2011; Weisz, Ng, et al, 2013; Weisz, Kuppens, et al., 2013), most youths who are referred for treatment show high rates of diagnostic comorbidity, a finding reflected in numerous studies examining youths referred for services (Garland et al., 2001; Weisz et al., 2012). In a sample of adolescents with unmet emotional and behavioral needs, 80% had more than one diagnosis (Hogue & Dauber, 2013). Thus, comorbidity is the rule – not the exception – in many clinical settings. This mirrors the high rates of comorbidity found in large epidemiological samples of youths, where the presence of any one psychiatric diagnosis greatly increases the likelihood of two or more (Angold, Costello, & Erkanli, 1999; Costello, Mustillo, Erkanli, Keeler, & Angold, 2003).

In contrast, some critics have suggested that studies of treatment outcome reduce or minimize comorbidity among participants (Westen & Morrison, 2001). In one review of 298 RCTs published before 2002, more than half of the articles made no mention of what their exclusionary criteria were, making it impossible to determine their clinical representativeness (Jensen-Doss, 2005). In those articles that did specify exclusionary criteria, 36% indicated that they excluded comorbid participants, whereas 17% mentioned including participants with some types of comorbidity (Jensen-Doss, 2005). Since that time, some of the largest-sample studies of single disorder treatments have reported that substantial percentages of their participants met criteria for at least one other nontargeted diagnosis – 68% in the NIMH Collaborative Multisite Multimodal Treatment Study of Children With Attention-Deficit/Hyperactivity Disorder (MTA), 48% and 55% in the Treatment for Adolescents with Depression Study (TADS) and the Child/Adolescent Anxiety Multimodal Study (CAMS) (Arnold et al., 1997; Kendall et al., 2010; TADS, 2005), respectively. Some specific, commonly co-occurring types of diagnostic comorbidity were excluded, however – for example, comorbid depression or uncontrolled ADHD in CAMS (Compton et al., 2010), and suicidality among those treated in TADS (2003). These two large trials also excluded participants when a comorbid disorder or condition was determined to be as impairing as the target disorder and warranting intervention with a different single-disorder treatment (Compton et al., 2010; TADS, 2005). This may present a particular challenge in the light of the finding that of 66% of community-referred youth in one recent study reported that they needed treatment to address more than one equally impairing disorder (Hogue & Dauber, 2013).

To recap, single-disorder EBTs are often developed for circumscribed targets and tested with clients whose problems fit neatly within the treatment focus, but treatment needs among referred clients in mental health service settings frequently span disorders. In this article, we briefly review evidence on EBTs in relation to comorbid conditions, we discuss three emerging evidence-guided

approaches that give clinicians tools for addressing comorbidity, and we offer recommendations for future development and research.

Can single-disorder EBTs address comorbid conditions?

The merits of single-disorder EBTs, their empirical support, and their potential value in advancing the quality of care for youths is increasingly evident (Weisz, Hawley, & Doss, 2004; Weisz, Ng, et al, 2013; Weisz, Kuppens, et al., 2013). RCTs that have included comorbid youths provide an opportunity to test whether comorbidity moderates treatment outcome for single-disorder EBTs. In a narrative review of 130 published outcome studies testing treatments for commonly occurring youth disorders, Ollendick, Jarrett, Grills-Tauchel, Hovey, and Wolff (2008) noted that most of the trials reviewed did not systematically collect information about participant comorbidity, or examine comorbidity as a predictor or a moderator of treatment benefit. The authors concluded that the majority of studies examining comorbidity as a possible moderator found no significant moderator effects for treatments of anxiety, affective, ADHD, and oppositional/conduct disorders. This review pulls together interesting evidence on a very important question; the review also suggests useful questions for the future. For example, for those studies that did include comorbidity moderation tests, it would be helpful to know their level of statistical power to detect moderation, given the heavy sample size requirements for many moderation analyses. It would also be helpful to have a quantitative synthesis estimating the mean moderation effect across studies. Lastly, while it would be helpful to establish that client comorbidity does not reduce the benefit of single-disorder EBTs on the problems they specifically target, it would also be valuable to address the key question of how single-disorder EBTs fare in directly addressing the comorbid conditions.

A recent systematic review examined studies published between 1994 and 2009, seeking to address precisely that question – that is, whether EBTs have beneficial effects on comorbid disorders (Riosa, McArthur, & Preyde, 2011). Although hundreds of youth treatment studies had been published during those years, the authors identified only ten controlled trials of psychosocial interventions that included youth samples with at least one additional clinically impairing disorder or concern that was beyond the focus of the treatment and was measured at pre- and post-assessment points. Unfortunately, such a small study pool could not provide a very reliable picture, but the review did report large pre- to posteffect sizes ($d = 1.12$ for externalizing and $d = 1.09$ for internalizing behavior outcomes) for outcomes overall. The authors differentiated between trials in which the comorbid condition was clearly homotypic – that is, shared the same classification as ‘internalizing’ or ‘externalizing’ as the target of the single-disorder treatment being tested – versus heterotypic. For the three studies with homotypic comorbidity, the average pre- to post-treatment effect size was large ($d = 1.18$). A more modest average effect was found for the two studies where the comorbid condition was clearly heterotypic ($d = 0.57$). In one of these studies, an anxiety treatment substantially reduced diagnoses of ADHD and ODD

among participants (Kendall, Brady, & Verduin, 2001); in the other study, an EBT for depression did not significantly improve outcomes for conduct disorder (Rohde, Clarke, Mace, Jorgensen, & Seeley, 2004). The remaining five studies could not be characterized with regard to homotypic or heterotypic comorbidity. In the future, it would be helpful to build on this interesting work by Riosa et al. (2011) by reporting post-treatment group comparison effect sizes (rather than pre vs. post), to provide a more unambiguous assessment of true treatment effects, and to place the estimate of treatment impact on comorbid conditions on the effect size scale that is most widely used in RCT comparisons.

Adapting single disorder treatment manuals to accommodate clients

The review by Riosa et al. (2011) indicates that very few studies have expressly tested the effects of interventions on youth comorbidity, and raises the question of whether treatment benefit declines when the comorbid condition and the target condition are heterotypic. The fact that only 1% of the studies found by Riosa et al. tested outcomes on comorbid conditions suggests that a great deal of work remains to be done on this question. An additional limitation of the research to date is that it does not provide much evidence on what clinicians using an EBT should do when they encounter comorbidities. Kendall and Beidas (2007) have suggested using 'flexibility within fidelity'. In this approach, elaborated by Chu, Merson, Zandberg, and Areizaga (2012), a clinician 'chooses an empirically supported treatment manual designed to address a specific target disorder and then uses clinical judgment and supervision to adapt treatment strategies to meet the individualized needs of each client' (Chu et al., 2012, p. 5). Clinicians may sometimes lack the support needed to accomplish such adaptation.

Indeed, one study reported that one of the identified challenges to implementing EBTs in community settings, even among clinicians dedicated to doing so, was the lack of role models both within and outside of the organization available to provide technical oversight and supervision (Powell, Hausmann-Stabile, & McMillen, 2013). Clinicians in this same study identified the need to learn multiple EBTs in order to meet the caseload demands as a major barrier to EBT implementation. Clinical care settings often rely on brief training workshops with limited follow-up as their means of training clinicians in EBTs (Beidas & Kendall, 2010). By themselves, these trainings appear to be an inadequate method of producing clinician proficiency in the basic implementation of the EBT, and may consequently fall short as a means of preparation for the skillful tailoring comorbid conditions demand.

Perceived incompatibility of single disorder EBTs and comorbid youths

The limited evidence base for treatments with known effects for comorbid problems and the lack of guidance about how to adjust EBTs for comorbid clients are two challenges faced by those seeking to use EBTs in routine care settings. A third complication is clinician perception. In a qualitative study of practicing psychologists' views on using EBTs, clinicians commonly expressed

concerns that comorbidities are not addressed in most RCTs and that their clients showed too much diagnostic complexity to benefit from single-disorder treatments (Stewart, Stirman, & Chambless, 2012).

Such clinician perceptions could certainly undermine efforts to encourage everyday use of EBTs. In a study of a large state roll-out, nearly a quarter of community clinicians trained to use separate EBTs to treat conduct problems, depression, and anxiety failed to use these treatments despite being mandated to do so (Jensen-Doss, Hawley, Lopez, & Osterberg, 2009). The clinicians indicated that they needed to deviate from the single-disorder protocols in order to meet their clients' needs. Community clinicians may prioritize a treatment's flexibility over any research evidence, as indicated by a survey of mental health practitioners from all major regions of the United States (Nelson & Steele, 2008). This is consistent with research showing that clinicians who were trained in identical therapeutic practices and told they would be delivering them flexibly showed more positive attitudes toward EBTs than their counterparts, who were told they would be delivering them as directed by standard, single disorder treatment manuals (Borntrager, Chorpita, Higa-McMillan, & Weisz, 2009).

Structured methods for addressing comorbidity: Three evidence-guided approaches

One way to measure the need for well-tested treatments that help clinicians directly address comorbidity and co-occurring problems is to examine how these problems are being managed in their absence. In a study of youths treated in the state of Hawaii's system of care, Orimoto, Mueller, Hayashi, and Nakamura (2014) found that clinicians used more diverse intervention strategies from distinct theoretical or conceptual groupings (e.g. behavior management, cognitive, nonspecific) with comorbid clients relative to those with only one diagnosis. The diversity of the strategies, as well as the number of strategies introduced, increased with the number of diagnoses. Essentially, when faced with youths who had more than one diagnosis, clinicians chose treatment strategies beyond the bounds of single-disorder EBTs. This contrasts with the more concentrated approach of single-disorder EBTs, especially as tested in RCTs. As stated by Rohde, 'Both approaches – the research clinician rigorously providing a single intervention intentionally or unintentionally ignoring other problems versus the hypothetical 'real-world' clinician providing breadth of care but not depth – may do clients a disservice' (2012, p. 85). Fortunately, recent advances may help clinicians manage these dilemmas by providing structured support for treatments encompassing comorbidity. To illustrate, we describe three approaches: conceptually unified treatments, modular protocols, and monitoring and feedback systems (MFSs).

A focus on etiological overlap: Conceptually unified treatments

The discussion of comorbidity is timely, given the recent criticism of traditional diagnostic classification tools and an emerging focus on observable behavior or neurobiological dimensions to classify psychopathology (Insel, 2014). This new emphasis has the potential to

push treatment past taxonomic distinctions among mental health disorders and toward a focus on common pathways. As a step in that direction, conceptually unified treatments incorporate information about presumed shared causal and maintaining factors to develop interventions that address more than one disorder or problem area within a cohesive framework (Barlow, Allen, & Choate, 2004; Fairburn, Cooper, Shafran, & Wilson, 2008). We refer to these treatments as ‘conceptually unified’ to reflect that they target core processes of psychopathology using a single approach. Anxiety and depression, for example, share a number of symptoms (decreased concentration, inaccurate appraisals of events), similar theoretical and developmental mechanisms (interplay of biological vulnerability and life stress, maintained by maladaptive responses and poor problem-solving), and respond comparably to some similar treatment strategies (cognitive restructuring, SSRIs) (Ehrenreich-May & Bilek, 2012; Weersing, Rozenman, Maher-Bridge, & Campo, 2012), suggesting that core intervention techniques may work for both diagnoses.

As one example, the Unified Protocol for the Treatment of Emotional Disorders in Adolescents (UP-A) (Ehrenreich et al., 2008) was adapted from a transdiagnostic treatment for adults (Barlow et al., 2010) and is a flexible intervention for youth with anxiety or depression, or their co-occurrence. Five required treatment components reflect core principles of emotion regulation: psychoeducation about emotional experiences; increased awareness of physical sensations; identifying and reappraising automatic attributions; preventing avoidance and other maladaptive behaviors; and maintaining gains made during treatment. Optional components include motivational enhancement techniques, the management of crisis situations (including suicidal or homicidal ideation), and material to help parents respond adaptively to their adolescents’ behavior. In an open trial, 12 adolescents with primary anxiety or depression diagnoses completed up to 16 sessions of an early version of UP-A. Clinical severity ratings for all disorders were significantly reduced from pre- to posttreatment, and maintained at 3 and 6-month follow-up (Trosper, Buzzella, Bennett, & Ehrenreich, 2009). A version of UP-A has also been developed for younger children in a group format, with promising results from an open trial of 22 children with a primary anxiety disorder (Bilek & Ehrenreich-May, 2012). A separate but comparable set of studies show early support for a conceptually unified treatment to address co-occurring anxiety and depression that focuses on psychoeducation, relaxation, problem-solving skills, and graded engagement, which integrates the literatures on behavioral exposure for anxious youths and behavioral activation for individuals with depression (Weersing, Gonzalez, Campo, & Lucas, 2008). Positive results have been published from case studies, and the protocol has recently been expanded to address anxiety, depression, and somatic distress (Weersing et al., 2012). Ideally, these findings will be augmented by trials in which unified approaches are compared to other active conditions, and in particular, when they are compared to single-disorder EBTs.

The potential benefits of this conceptually unified approach have been enumerated elsewhere (Friedberg et al., 2014; Rohde, 2012); these treatments have the potential to reduce the number of separate protocols

that clinicians must learn and, therefore, to increase clinician and supervisor efficiency while increasing capacity to meet the needs of individual complex clients and complex, variegated caseloads (Girio-Herrera & Ehrenreich-May, 2014). These efforts also reflect a thoughtful approach to putative mechanisms of change, streamlining the delivery of evidence-based care when those processes appear to overlap (Rohde, 2012). The relative brevity of these treatments is a good fit with the often-limited sessions and resources available in community settings (Weersing et al., 2008).

One potential shortcoming of such approaches is that they fail to address comorbidity that is less obviously congruent with regard to symptom presentation and mechanistic underpinnings. Anxiety and depression are highly comorbid, and effective single disorder treatments for each are conveniently companionable with the other. Consider two other highly comorbid problems: oppositional defiant disorder (ODD) and anxiety disorders. Nock, Kazdin, Hiripi, and Kessler (2007) reported that 60% of youths with ODD have a comorbid anxiety disorder; 62% of anxious youths in public systems of care likewise had a comorbid diagnosis of ODD (Chavira, Garland, Yeh, McCabe, & Hough, 2009). Synthesizing treatments for these two problem domains is notably less straightforward than for anxiety and depression. While the majority of EBTs for youth anxiety focus primarily on working directly with the youths, the best evidence for the treatment of ODD typically involves a focus on caregivers. The most strongly supported treatment approaches for the two problem areas – that is, CBT for anxiety and depression, behavioral intervention for conduct problems – are substantively different, not completely compatible theoretically, not so easily combined, and, therefore, less amenable to blending within a single integrated protocol. What is to be done about this challenge? This question brings us to a second transdiagnostic approach: modular protocols.

Modular approaches capitalize on and extend single-disorder EBTs

Modular approaches are less a single protocol or distinct new treatment, and more a ‘delivery system’ or repackaging of the individual elements that make up tested protocols for youth mental health problems. The increased focus on empirical testing of treatment techniques and the need for replication led to the development of manuals to aid in that replication, but while each single-disorder EBT possesses unique qualities, there is also substantial overlap among them in terms of individual strategies. Efforts to identify the therapeutic components, or ‘practice elements’ (Chorpita, Daleiden, & Weisz, 2005) of youth protocols tested in RCTs have resulted in a discrete, manageable number of practice elements that occur with frequency in the treatments with the best empirical support. Not only are there ‘greatest hits’ within one family of treatments (behavioral exposure in multiple treatment protocols for youth anxiety), but there are also some practice elements that appear across different diagnostic categories (tangible rewards to increase compliance may appear with high frequency in treatments that address conduct problems, but may also be present, though less frequently, in treatments for anxiety disorders and depression).

Given the sheer volume of diagnostically diverse, often comorbid clients on a clinician's caseload in usual practice, this approach may be a good conceptual match to clinicians' needs. While the 'modules' in a modular system refer to the individual practice elements, an overarching organizational framework can help ensure that the sequencing of these practices reflects the best available evidence and can give the clinician the flexibility needed to build a personalized treatment suited to the needs of the client (Chorpita & Weisz, 2009; Weisz & Chorpita, 2012). Following a modular protocol for multiple anxiety disorders (Chorpita, 2007), modular approaches have been developed for child behavior problems (Kolko et al., 2009), adult survivors of violence (Murray et al., 2014), body dysmorphic disorder (Wilhelm, Phillips, Fama, Greenberg, & Steketee, 2011), and youth anxiety, depression, trauma and conduct problems (Chorpita & Weisz, 2009), among others.

We will expand upon the utility of modular approaches to meet the needs of comorbid clients using the Modular Approach to Therapy for Children with Anxiety, Depression, Trauma and Conduct (MATCH; Chorpita & Weisz, 2009). MATCH has been published in book format, but it should not be considered a single treatment protocol. The various treatment procedures within the book can be used in data-guided combinations to treat youths aged 8–13 with any of the four problem areas named in the title – or any combination of them. MATCH has been tested in a randomized effectiveness trial and compared to both usual care and a 'standard manual' condition in which clinicians were trained and supervised in the use of separate single-disorder EBTs for anxiety, depression, and disruptive conduct. Clinically referred youths with high rates of comorbidity who were randomized to community clinicians in each condition showed greater improvement in MATCH than usual care and single-disorder EBTs on both weekly assessment and pre- to post-treatment measures. The superiority of MATCH over usual care was maintained over the course of a 2-year follow-up (Chorpita et al., 2013; Weisz et al., 2012). Importantly, MATCH clinicians' ratings of their satisfaction with treatment at the end of each episode were significantly higher than clinician ratings in the other conditions – suggesting that MATCH's flexible format and capacity to treat comorbidity was preferable to the single-disorder EBTs, even though the practice elements embedded within are essentially the same.

MATCH uses a consistent structure and format to link together the various practice elements – 33 in all – that are combined to create unique treatments for individual clients. Each primary treatment target (anxiety, depression, conduct problems, or trauma) has a flowchart that represents a default sequence of practice elements thought to have both logical and empirical support. In a distinctive feature, MATCH assumes that numerous factors stemming from comorbid diagnoses or ecological stressors may 'interfere' with the linear sequencing of the primary protocol, and tackles these challenges within the flowchart.

As an example, MATCH could be applied to a client with a diagnosis of simple phobia, following the flowchart for the primary anxiety protocol, in a way that was consistent with the best-tested single-disorder EBTs for youth anxiety. However, if the youth in question also had a comorbid diagnosis of ODD that threatened to interfere

with treatment progress – for example, he refused to complete exposures or exhibited disruptive behavior in order to escape fear-provoking situations – the flowchart suggests specific practices (tangible rewards and active ignoring) to address different commonly occurring sources of interference (in this example, low motivation and attention seeking, respectively). If the same comorbid youth were able to progress through the anxiety protocol without treatment interference, but had impairment related to the diagnosis of ODD after that treatment was complete, parts or all of the primary protocol for conduct problems might follow the anxiety treatment.

In the RCT comparing MATCH to usual care and single-disorder EBTs, 50% of the youths in the MATCH condition received treatments that utilized practice elements from multiple problem areas (e.g. including a practice element from the depression primary protocol in a treatment of anxiety), compared to only 2% of the cases treated with the single-disorder EBTs (Weisz et al., 2012). However, MATCH clinicians were also highly adherent to the practices recommended by the protocol – so, clinicians appear to be maintaining the use of evidence-based components and not venturing into broader terrain even while they used a range of prescribed EBT elements to address client needs. This may be an antidote to the phenomenon noted by Orimoto et al. (2014) wherein clinicians naturally used more intervention strategies outside of those recommended by EBTs when treating comorbid clients.

When to stay the course and when to change direction? Monitoring and feedback systems to aid clinical decision-making

The MATCH flowcharts offer recommendations related to the different practice elements from the youth evidence base that can be combined to create individualized treatment plans, but do not aid clinicians in determining when it might be necessary to deviate from a primary protocol or augment an episode of care to address lingering impairment. In the RCT of MATCH, use of modular and standard protocols was paired with a MFS that provided weekly youth client and caregiver ratings of internalizing and externalizing problems and consumer nominated 'top problems' identified as most in need of treatment when services began (Weisz et al., 2011, 2012). Clinicians tracked whether the targeted top problems were growing less severe during treatment, while systematically monitoring the severity of comorbid problems. A pattern of clinical worsening in the targeted problems might suggest the need for a subsequent shift in treatment focus. If this shift led to reduced severity of the newly targeted problems, that improvement might signal that the original focus of treatment could be resumed. In this way, the treatment design and process can be informed by ongoing evidence of the youth's treatment response, in addition to the broader treatment outcome evidence base on the practice elements included in the modular protocol. In the MATCH RCT (Weisz et al., 2012), MATCH outperformed the standard protocols and usual care on the weekly measures of internalizing and externalizing problems, as well as top problems.

Such systems are not unique to the MATCH effectiveness trial – there is substantial and growing empirical

support for MFSs, primarily in the adult therapy literature. One well-studied MFS is the Outcome Questionnaire (OQ) System, developed by Lambert and colleagues. A core component of this system is that it provides an ‘alarm’ that alerts clinicians when the client’s measurement pattern indicates clinically significant worsening – signaling that the clinician needs to consider an alternative course of action in order to prevent an unsuccessful course of treatment (Lambert et al., 2002). In a meta-analysis of OQ studies, Shimokawa, Lambert, and Smart (2010) analyzed the combined data of six OQ feedback studies and demonstrated that the average at-risk client whose clinician received feedback was better off than approximately 70% of clients in the treatment as usual (TAU) condition whose clinicians did not receive feedback. We look forward to evidence on outcomes for a popular youth version of the OQ system, the Youth Outcome Questionnaire (Burlingame et al., 2001).

Clinical outcomes have been studied in relation to at least one youth MFS system, developed by Bickman, Kelley, Breda, de Andrade, and Riemer (2011). In this study, clinicians at 28 practice sites were randomly assigned to receive either weekly client and caregiver feedback or to receive feedback only every 90 days. Feedback was provided using the Contextual Feedback System (CFS), a web-based MFS that provides clinicians with indicators of treatment progress (e.g. symptoms and functioning) and process (e.g. motivation for treatment, therapeutic alliance). Results showed that youths whose clinicians received weekly feedback improved significantly faster than those whose clinicians did not, and that the more clinicians viewed the feedback, the faster their clients improved (Bickman et al., 2011). Such MFS systems as the OQ/YOQ or CFS may offer synergistic benefit when paired with EBTs, in particular to guide the sort of clinical decision-making clinicians face when they treat comorbid clients.

Remaining considerations for managing comorbidity with EBTs

Treating clients with comorbid diagnoses can be very tricky for the clinician. Do you focus first on one disorder, and hope that the treatment progress will spread? Do you switch interventions routinely to target whatever seems primary in a given week? Do you abandon the treatments that have been tested because the populations they benefit are too different from your clients? Or do you persist even when the goodness-of-fit is less than ideal? As we have discussed, a case can be made for and against each of these approaches, but promising inroads are being made via conceptually unified treatments and modular EBT protocols designed to address comorbidity and co-occurring problems, and with MFSs that can take some of the whimsy out of making the complicated clinical judgments that are required. A comparison of these approaches, with advantages and challenges of each, is presented in Table 1.

In this review we discussed intervention approaches that capitalize on the vast evidence-base for single-disorder EBTs, and considered how these approaches can target common etiological pathways, be used in a coordinated and complimentary fashion for multiproblem youths and caseloads, and enhanced by MFS systems. It

bears mention that beyond specific practices that are supported by the evidence-base, there are also some treatment methodologies that may cut across diagnostic categories. In vivo coaching of caregiver-child interactions has been used successfully in the treatment of disruptive behavior disorders, most notably in Parent-Child Interaction Therapy (PCIT; McNeil et al., 2010; Thomas & Zimmer-Gembeck, 2007). Building upon this success, treatment developers focused on other diagnostic categories have begun testing in vivo caregiver coaching in open trials, for example, to treat young children with anxiety disorders or those with preschool aged depression (Carpenter, Puliafico, Kurtz, Pincus, & Comer, 2014). Home visit methodology may also benefit youths with a range of emotional and behavioral concerns (Barlow et al., 2003). Used throughout the United States, United Kingdom, and Australia, the practice of a health professional meeting with caregivers of high-risk youth in the home is not a detailed intervention program, *per se*, but rather a methodological approach to service delivery. While overall effects across numerous programs and populations are in the small range for child socioemotional outcomes (Sweet & Appelbaum, 2004), one such program, The Parent Advisor Service, led to significant decreases in youth internalizing and externalizing problems, as well as improvement on a number of caregiver-report variables (e.g. maternal self-esteem, parenting stress, more positive home environment) (Davis & Spurr, 1998). As these promising efforts suggest, bolstering EBTs to manage comorbidity may require innovation with regard to the where and how of treatment implementation. Home visitation approaches may be especially valuable, because families of comorbid youths are more likely than others to drop out of treatment in mental health clinics (Gonzalez, Weersing, Warnick, Scahill, & Woolston, 2011; Kazdin, Mazurick, & Bass, 1993). We turn now to some additional considerations, as the field moves toward more efficient treatment of comorbid youths.

How is fidelity defined when the treatment must flex to fit clients’ needs?

Flexibility implies some level of in-the-moment adaptation to keep clients engaged, address pressing issues that arise in session, and, on occasion, may require deviation from the session plan altogether. Treatment fidelity for EBTs, in contrast, has largely prioritized adherence, or the extent to which the treatment is delivered as intended (McLeod, Southam-Gerow, Tully, Rodríguez, & Smith, 2013), frequently measured in RCTs using checklists to determine whether a specific content area was covered in the designated session. Greater adherence has been linked with better outcomes in youth psychotherapy (e.g. Hogue et al., 2008; Schoenwald, Carter, Chapman, & Sheidow, 2008). Yet, treatment fidelity for interventions designed to be responsive to changing client needs and data feedback may be more nuanced. For MATCH, adherence has variously been assessed by looking at clinician implementation in session of the plan agreed upon during clinical supervision (Bearman et al., 2013), the extent to which session content reflected the content of the manual versus other elements (Weisz et al., 2012), and the congruence of practice element sequencing with the prescribed sequence of the flow-

Table 1. Comparison of three evidence-guided approaches to comorbidity

	Single-disorder EBTs	Conceptually unified treatments	Modular EBT protocols	Monitoring and feedback systems
Approach to comorbidity	Follow the predetermined sequence, address one target problem and use clinical judgment to modify for comorbid conditions	Address presumed causal or maintaining factors for more than one disorder within a single conceptually coherent treatment	Combine individual practices commonly occurring in separate EBTs to target a primary disorder; manage interference caused by comorbidity using decision flowcharts	Use real-time client feedback related to improving or worsening of target or comorbid conditions to assist with clinical decision-making
Example	Parent-Child Interaction Therapy (McNeil et al., 2010)	Unified Protocol for the Treatment of Emotional Disorders in Adolescents (UP-A) (Ehrenreich et al., 2008)	Modular Approach to Therapy with Children (MATCH; Chorpita & Weisz, 2009)	Contextualized Feedback Systems (Bickman et al., 2011)
Advantages	RCTs with comorbid samples show benefit on target problems Examples of how to adjust to comorbidity are available	Reduces clinician burden to learn multiple treatments Addresses the needs of some comorbid clients and assists clinicians with complex caseloads	Provides structured guidance for deviations from single-disorder EBTs, even for heterotypic comorbidity RCT showed benefit in a highly comorbid youth sample Clinician satisfaction is high	Provides evidence for when to deviate from best-tested practices and sequencing Can be paired with any intervention RCT showed benefit in routine practice settings
Challenges	Often tested with some types of comorbidity excluded May be challenging to adapt for comorbid clients without expert supervision May require clinicians to be trained in multiple separate treatments	More amenable to homotypic than heterotypic comorbidity	Decisions about when to deviate from the best-tested practice sequence rely on clinical judgment – unless paired with a monitoring and feedback system Broad problem coverage and decision complexity may reduce ease of use and clinician appeal	Clinicians report barriers to using MFS (Bickman, 2008) When not paired with an EBT, clinicians lack guidance when feedback shows poor client response to treatment
Research Directions	Outcome trials that measure the benefit for comorbid conditions in real-world settings	RCT comparison to single-disorder EBTs among comorbid samples	Refining via component analysis and treatment dismantling studies Clarifying the relation between flexibility and fidelity on outcome	Comparing the utility of MFS with and without pairing of EBTs Increasing user-appeal and thus rates of use by clinicians

charts (Park, Chorpita, Regan, & Weisz, 2014). Any of these might be appropriate, and each adds to the overall picture; it remains to be seen which aspect is most crucial to improving treatment outcomes. Given that usual care treatment for youths is characterized by use of a broad range of therapeutic strategies, and that single-disorder EBT delivery appears to be characterized by in-depth delivery of a narrower range of practice elements (Garland et al., 2010), it will be important to ensure that measures can capture treatment integrity related to flexible practice that still reflects the best available data from the treatment evidence base.

Can flowcharts, decision rules, and data be made clinician-friendly?

We are cautiously optimistic about the potential of strategies involving aggregating across multiple youth EBT components, using data-driven algorithms to guide treatment decision-making, and tailoring and personalizing treatment using real-time data from youth clients and caregivers. However, we are less certain about the perspective of the clinicians for whom these systems are being designed. Although clinicians have reported high levels of satisfaction with MATCH, as we indicated ear-

lier, we have also found that clinicians identify the flowcharts and decision trees associated with these flexible interventions as their least preferred aspects (Terry, Bailin, Bearman, & Weisz, 2014). Others have noted significant barriers to clinicians' adoption and ongoing use of measurement feedback systems (Bickman, 2008). Simply put, no matter how great their potential for benefit, these systems must fit into the work contexts of clinicians in practice, and be seen by clinicians as both do-able and beneficial, if that potential is to be realized. Further research will be needed to identify the best ways to improve the user experience in order to capitalize on the promise of these new technologies.

Keeping protocols lean without sacrificing support

If there were to be a shift in emphasis from many single-disorder EBTs to a smaller number of multicomponent treatments or EBT delivery systems, one effect would be a reduction in the time and effort required of clinicians who have previously had to master numerous separate treatments to meet the needs of comorbid or complex clients. On the other hand, mastering a treatment such as MATCH, which has four disorder sections and 33 sep-

arate modules, is no simple task. Further streamlining could be very helpful, and might be feasible. Not all of these 33 MATCH modules represent completely distinct treatment principles – for example, there are separate modules for cognitive restructuring with anxious youths versus depressed youths, and separate rapport-building modules for different diagnostic categories. Some practice elements that have separate literatures are arguably similar conceptually (for example, behavioral exposure to target avoidance of fear-provoking stimuli among anxious youths and behavioral activation to address the avoidance that reduces access to environmental reinforcers among depressed youths) (Dimidjian, Barrera, Martell, Muñoz, & Lewinsohn, 2011). Some pruning of distinct practice elements may increase usability. At the same time, paring down the number of distinct practice elements would also mean reducing the specificity of each, in terms of scripting, suggested activities, and clear guidelines – specificity that some clinicians rely upon and appreciate. The challenge for future iterations of all modular or multicomponent protocols is to reduce unnecessary redundancies while keeping supportive scaffolding intact.

A related consideration is that many separate practice elements that comprise single-disorder EBT ‘packages’ have not themselves been individually tested and found to be related to treatment outcome. Treatment dismantling research and component analyses may be an essential step in separating the wheat from the chaff and reducing the number of individual practice elements.

Supporting treatment of comorbid youth through improved training and supervision

Hofmann (2013) noted that a good treatment manual ‘can be a useful training tool and clinical aid, but it cannot replace a solid clinical training and theoretical knowledge.’ (p. 605). This is certainly true for complex and comorbid clients, whose treatment needs may often require deviations from the standard sequence that cannot be described in most single-disorder EBT manuals (Baucom & Boeding, 2013). Even when using conceptually unified protocols or modular delivery of EBTs, adjustments with regard to the intensity or sequencing of a particular practice may require an understanding of both etiological pathways and the mechanisms of change the intervention is designed to activate. Abramowitz (2013) describes some clinicians’ propensity to encourage clients to use relaxation while confronting feared stimuli, as in an exposure task. He suggests that this stems from a misunderstanding of theoretical models positing that avoidance of anxious arousal perpetuates anxiety disorders, and that tolerating – not reducing – anxiety is the goal of treatment. While noting that relaxation in this context has intuitive appeal because it may reduce client distress, Abramowitz (2013) warns that the use of relaxation during exposure tasks may ultimately interfere with new learning about the feared stimuli. This example illustrates how knowledge of the factors that contribute to and maintain psychological problems is a prerequisite for the selection and skillful use of even the best-supported treatments. Wide-scale dissemination of evidence-guided approaches will hinge upon a well-trained workforce that is knowledgeable in

both the technical and theoretical aspects of EBTs, including the change mechanisms that are part of the intervention theory, and methods for developing and assessing these competencies should be tested alongside new treatments.

Conclusions

The best available scientifically informed treatments for youth disorders are largely focused on the amelioration of symptoms or impairment related to one or a narrowly circumscribed family of disorders or problems. In contrast, youths treated in most usual care settings frequently present with more than one diagnosis or presenting concern. Although some clinicians may use single-disorder EBTs effectively in treating the conditions targeted by the EBT, it is not clear that the treatments are equally effective in treating the comorbid conditions or the impairment they cause. Moreover, clinician perception of poor fit may limit the apparent relevance, and thus the everyday use, of single-disorder EBTs. Three evidence-guided approaches – that is, conceptually unified protocols, modular delivery of EBT practice elements, and MFSs – have all emerged as promising advances offering structured support for addressing comorbidity. To enhance the contribution of these approaches, researchers should focus on appropriate measurement of treatment fidelity within flexible protocols, increasing the user-appeal of systems that guide clinical decision-making, simplifying treatment protocols using component analysis to reduce redundancy, and the training and supportive infrastructure needed for effective use with complex cases.

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