Measuring Patient Symptom Change on Rural Psychiatry Units: Utility of the Symptom Checklist-90 Revised

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Background: Mental health service providers have seen an increased need for demonstrating symptom reductions during the past decade. This change has been particularly evident to those working in inpatient psychiatry facilities where there is considerable need for a brief, easily administered, and low-cost means of tracking symptom change. The current study evaluated the utility of using the Symptom Checklist-90 Revised for tracking symptom reductions in patients admitted to rural adolescent and adult psychiatry units.

Method: Consecutive admissions to adolescent (N = 104) and adult (N = 125) psychiatry units located in a rural community hospital served as subjects. The mean length of stay was 8 days for adolescents and 7 days for adults. Patients were administered the Symptom Checklist-90 Revised at admission and just prior to discharge. Psychiatrists provided a DSM-IV primary diagnosis for each patient.

Results: Principal component analyses on both the adolescent and adult admission and discharge Symptom Checklist-90 Revised subscales resulted in a 1-factor solution. Repeated-measures ANOVAs demonstrated the Global Severity Index to be a sensitive measure of clinically significant admission-to-discharge symptom change. Analyses using psychiatrist-assigned diagnoses revealed that all diagnostic categories evinced significant admission-to-discharge symptom reductions.

Discussion: Implications for using the Symptom Checklist-90 Revised to evaluate clinically significant symptom changes on rural inpatient psychiatry units are discussed.

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The corporate response to health care reform over the past decade has resulted in rapid expansion of the managed care of mental health services. Along with the growth of managed care has come an increased emphasis on demonstrating treatment-related changes that, in turn, have often been translated into showing a decrease in psychiatric symptoms.[1–3] During the same period, a greater appreciation emerged for how measuring symptom reduction can help to establish clinically significant levels of change and ultimately determine whether sufficient treatment has been provided. Holcomb et al.[4] have similarly argued that self-reported descriptions of symptoms can aid diagnosis and shed light onto a patient's unique experience of distress. For all these reasons, professionals involved in mental health service delivery have become increasingly interested in assessing the severity of psychiatric symptoms and tracking symptom change.[3]

Measuring patient symptoms has often been based on patient self-report, and the use of self-report measures has become popular for a number of reasons. First, they are relatively brief and economical.[5] Second, they are typically easy to administer and score. Third, they can be used to quantify psychiatric symptoms over time.[6] These features have become increasingly important in inpatient environments, as lengths of stay have decreased and regular evaluations are required to meet continued-stay criteria. Several empirically informed models have been proposed for organizing self-reported symptoms.[7] Multidimensional strategies are typically employed for describing patient features in terms of symptom clusters. For instance, the Minnesota Multiphasic Personality Inventory-Second Edition[8] uses such a strategy and provides descriptive information across a variety of symptom clusters. The multidimensional model has the potential for providing a rich portrait of patient functioning. Critics of this approach have focused on the amount of time required to complete such self-report measures, the extensive training that is often required for accurate interpretation, and the general lack of direct clinical utility. In keeping with our Minnesota Multiphasic Personality Inventory-Second Edition example, the measure contains over 500 items, takes patients over 2 hours to complete, requires extensive train-

Figure 1. DSM-IV Diagnoses Among 104 Adolescents
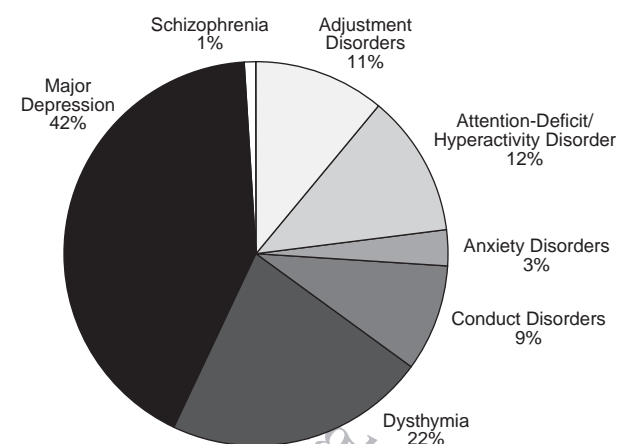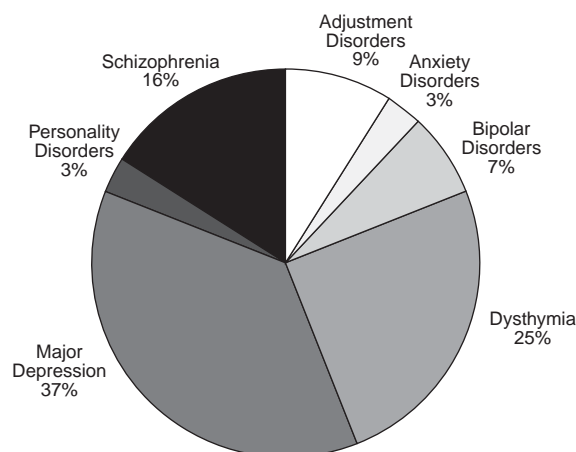Consecutively Admitted to a Rural Community Hospital

Figure 2. DSM-IV Diagnoses Among 125 Adults
Consecutively Admitted to a Rural Community Hospital

ing to ensure correct interpretation, and is not particularly sensitive to tracking client changes through repeated administrations. An alternative model for describing patient functioning relies on quantifying the overall severity of patient symptoms using a single dimension. The commonly used Beck Depression Inventory[9] serves as an apt example of this model. The Beck Depression Inventory contains 21 items and has been found to be a sensitive self-report measure of depression. Critics of this approach typically focus on the lack of utility associated with this type of narrow-band assessment. For instance, the Beck Depression Inventory is not appropriate for measuring the varied types of psychiatric symptoms typically found on rural psychiatry inpatient units. Finally, measures like the Symptom Checklist-90 Revised[10] employ both strategies. The Symptom Checklist-90 Revised is purported to measure 9 separate facets of psychopathology and also provides an overall measure of psychiatric symptoms.[7,11–16]

The Symptom Checklist-90 Revised[10] has received growing attention as a brief, low-cost, and easily administered measure of psychiatric symptoms.[6] Nevertheless, considerable controversy exists regarding the structure of the measure and whether it is best conceptualized as a multidimensional or unidimensional measure of symptom severity. Although early studies found evidence for a number of factors, the exact number has varied. For instance, Derogatis and Cleary[17] identified 9 factors, Lipman et al.[18] identified 8 factors, and others identified 5 or fewer factors.[19] Further confusion has resulted from research that has found different subsets of the 90 items loading on different factors.[4] Although the number of facets identified and the item loading have been inconsistent, most have found a large portion of Symptom Checklist-90 Revised score variance explained by the first unrotated factor compared with the subsequent factors (e.g., 5 times
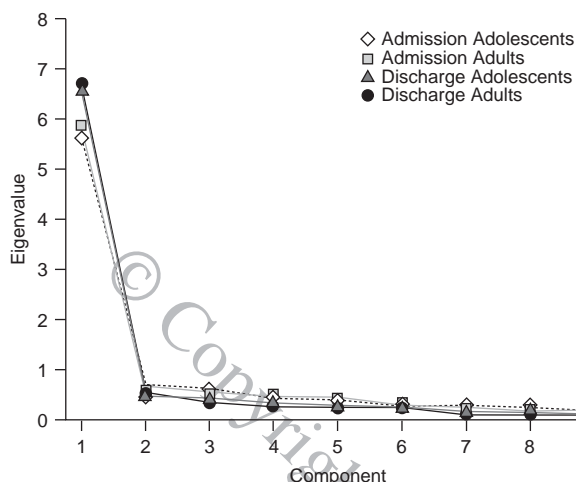
as much variance as the second factor[5]; 8 times as much variance as the second factor[20]; 6 times as much variance as the second factor[19]; and 9 times as much variance as the second factor[4]). The large percentage of variance attributable to the first factor in these studies suggests that the Symptom Checklist-90 Revised may be best thought of as a measure of general psychological distress.

Research using the Symptom Checklist-90 Revised[10] to track admission-to-discharge changes in psychiatry inpatients has been limited. One goal of the current study was to provide information regarding the factor structure of the Symptom Checklist-90 Revised with both rural adolescent and rural adult psychiatry inpatients upon admission and discharge. An additional goal was to determine the ability of the Symptom Checklist-90 Revised to measure clinically significant change over a relatively brief period. A final goal was to evaluate whether psychiatrist-determined *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*[21] (DSM-IV) diagnoses limited the clinical utility of this measure.

METHOD

One hundred four patients admitted to an adolescent inpatient psychiatry unit and 125 patients admitted to an adult inpatient psychiatry unit participated. Both units were located within the same rural community hospital. The adolescent sample was 48% female with a mean ± SD age of 15 ± 1.56 years. The adult sample was 53% female with a mean ± SD age of 35 ± 13.29 years. The mean length of stay for the adolescents was 8.27 ± 3.56 days (range, 1–17 days), whereas the mean length of stay for the adults was 6.70 ± 5.47 days (range, 1–36 days). All patients were interviewed and diagnosed by a board-certified psychiatrist using criteria listed in the DSM-IV. As shown

Figure 3. Symptom Checklist-90 Revised Scree Plots

Table 1. Mean Global Severity Index Scores

Sample	Admission	Discharge	Nonhospitalized
Adolescent psychiatry inpatients	62	50	
Adolescent nonpatients			50
Adult psychiatry inpatients	86	61	
Adult nonpatients			50

in Figures 1 and 2, a variety of primary diagnoses were represented.

Subjects completed the Symptom Checklist-90 Revised at admission and just prior to discharge. The Symptom Checklist-90 Revised describes 90 psychiatric symptoms that are rated on a 5-point scale ranging from 0 (not-at-all distressing) to 4 (extremely distressing). The measure requires between 12 and 15 minutes to complete and can be computer administered, scored, and interpreted. In addition to 3 global distress indices (Global Severity Index, Positive Symptom Distress Index, and Positive Symptom Total), information is provided for 9 primary symptom clusters (anxiety, depression, hostility, interpersonal sensitivity, obsessive-compulsive, paranoid ideation, phobic anxiety, psychoticism, and somatization). Although factor analytic studies have not generally supported the proposed factor structure, considerable research has found the Symptom Checklist-90 Revised[10] to be a useful measure of overall psychiatric symptoms.[5,20,22] One-week test-retest reliability estimates ranged from .80 to .90, whereas 2-week estimates ranged from .68 to .83. With regard to validity, several of the symptom clusters correlated with related constructs measured using the Minnesota Multiphasic Personality Inventory-Second Edition.[8]

RESULTS

Initial analyses found scores on the admission and discharge administrations of the Symptom Checklist-90 Revised unrelated to age, gender, or length of hospitalization for both the adolescent and adult samples. Separate adolescent and adult principal component analyses on the 9 primary symptom clusters for the admission and discharge administrations revealed a strikingly similar structure. As is apparent from the scree plots presented in

Figure 3, the first unrotated component accounted for the greatest percentage of the score variance (between 63% and 75%), whereas the second unrotated component accounted for substantially less score variance (between 5% and 7%).

Given the identification of a single factor structure associated with the primary symptom clusters, Global Severity Index scores were used to measure overall levels of psychopathology at admission and just prior to discharge. Scores were calculated based on the gender specific norms available for adolescent and adult nonpatient samples. Repeated-measure ANOVAs assessed for differences between admission and discharge scores. Significant findings emerged for both the adolescent (F = 89.06, df = 1,103; p < .01) and adult (F = 133.31, df = 1,124; p < .01) samples. Table 1 contains the admission and discharge score means for the adolescents and adults, as well as the score means for nonpatient adolescents and adults.

A procedure outlined by Jacobson and Truax[23] was used to evaluate whether the statistically significant changes translated to clinically significant differences. One way to conceptualize clinically significant change is to determine the percentage of patients that move from being a member of a dysfunctional population (pretreatment) to being a member of a functional or nonpatient population (posttreatment). In other words, the level of functioning just prior to discharge should fall closer to that of a nonpatient population. To test for this level of clinical significance, a cut-off score was calculated separately for adolescents and adults by adding their pretreatment score to the age- and gender-matched nonpatient sample scores presented in the Symptom Checklist-90 Revised Manual[10(pp22–23)] and then dividing by 2. Clinical significance was demonstrated when the posttreatment mean for a subject was below the resulting cut-off score. This criterion was reached for 78% of the adolescents and 72% of the adults.

Separate ANOVAs determined whether categorizing subjects according to the psychiatrist-determined DSM-IV primary diagnosis would alter the admission-to-discharge change scores for the adolescent and adult samples. Primary diagnosis served as the between-subject variable and admission-to-discharge Global Severity Index change scores served as the dependent variable. No significant effects were found for the adolescent (F = 1.61, df = 6,96; p = .15) or adult (F = 1.10, df = 6,117; p = .37) samples.

DISCUSSION

In the current era of managed care, accountability for treatment effects has been increasingly emphasized and objective data demonstrating clinically significant symptom reduction are useful. Due to the differences in resources and personnel available at rural versus urban facilities, rural inpatient psychiatry units can find this challenge rather daunting. The data presented in this study support the use of the Symptom Checklist-90 Revised[10] in rural settings; that is, the Global Severity Index was useful in tracking clinically significant reductions across the variety of diagnostic categories that are typically observed in these general psychiatry settings. Importantly, these findings held for both males and females admitted to adolescent and adult psychiatry units.

Several characteristics of the Symptom Checklist-90 Revised suggest that it also possesses high utility for rural settings. First, the inventory requires only a sixth grade reading level and takes about 13 minutes to complete. In addition, a minimal amount of staff time is needed to administer, score, and interpret the measure. For settings where computers are available, the Symptom Checklist-90 Revised can be computer administered, scored, and interpreted. Second, the Symptom Checklist-90 Revised is a standardized and empirically supported measure of psychiatric symptoms. This study found the Symptom Checklist-90 Revised tracked admission-to-discharge changes in psychiatric symptoms, and these changes held across a wide range of psychiatrist-determined DSM-IV diagnoses. Third, understanding the implications of score changes on the Global Severity Index does not require advanced training in psychometrics. Most lay personnel and managed care reviewers can understand the meaning behind a statement like "Mrs. (Mr.) X displayed a 30% reduction in general psychiatric symptoms during her (his) inpatient hospitalization." Finally, using the Symptom Checklist-90 Revised to track symptom reduction during hospitalization can also provide useful information for the patient and his or her family, the hospital staff, and referral sources.

There are limitations associated with this study, as well as for using the Symptom Checklist-90 Revised in the manner described. A major limitation stems from the rural nature of the setting. Many urban psychiatric facilities have special units that limit admissions to patients with specified conditions (affective disorders, traumatic stress disorders, addictive disorders, etc.). The structure, sensitivity, and clinical utility of the Symptom Checklist-90 Revised would very likely change as a result of the decreased patient variability on these more specialized units. Another limitation stems from the lack of validity scales that can be used to determine whether patients are presenting themselves in a biased manner. Nevertheless, one could argue about the overall utility of validity scales for general inpatient psychiatry services. For instance, there is a negative relationship between severe psychopathology and the ability to endorse self-report inventories in a manner that ensures a positive impression management. At a minimum, positive impression management requires patients to demonstrate knowledge of the socially appropriate responses. Admittedly, more significant problems exist for detecting the random responding of very confused patients or the bias associated with psychiatric patients motivated to create a negative impression. Negative impression management has been associated with such conditions as malingering and factitious disorder with psychiatric symptoms. Unfortunately, no self-report measure is likely to reliably identify these types of patients, and considerable clinical experience and judgment are required to make such diagnoses. A final limitation stems from only administering the Symptom Checklist-90 Revised upon admission and discharge. Future research should measure symptoms at a variety of points during the hospital stay. The use of daily administrations would provide detailed information regarding symptom change, and result in a better understanding of the relationship between symptom change and specific facets of patient care.

The use of self-reported symptom measures to evaluate treatment is likely to remain a significant component of providing inpatient psychiatry services well into the 21st century. The development of clinically sensitive self-report measures that can reliably quantify patient symptoms, yet require limited staff resources, is important for the managed care of inpatient psychiatry services. We believe the Symptom Checklist-90 Revised[10] can serve as a general measure of psychopathology that readily meets these needs in many rural inpatient psychiatry settings.

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