

Assessment of Resilience in the Aftermath of Trauma

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Resilience is a crucial component in determining the way in which individuals react to and deal with stress. A broad range of features is associated with resilience; these features relate to the strengths and positive aspects of an individual's mental state. In patients with posttraumatic stress disorder, resilience can be used as a measure of treatment outcome, with improved resilience increasing the likelihood of a favorable outcome. Resilience can be monitored using the Connor-Davidson Resilience Scale, and perceived vulnerability to the effects of stress can be monitored with the Sheehan Stress Vulnerability Scale. Both scales are well validated, self-rated, easy to use, and easily translatable. Within a short period of time, nonspecialists can be taught to use these in the field.

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Posttraumatic stress disorder (PTSD) and associated symptoms account for considerable morbidity and mortality.^{1,2} Optimization of outcome in individuals affected by trauma and PTSD is facilitated, in part, by the application of tools to assess various components of the condition. In particular, it is crucial to establish the presence of and assess psychological resilience. Recent years have witnessed a growing interest in the concept of resilience, and resilience is now recognized to be one of the most important factors in assessing both healthy and pathologic adjustment following trauma.³

Resilience can be defined as a measure of stress-coping ability, and it describes personal qualities that allow individuals and communities to grow and even thrive in the face of adversity.⁴⁻⁶ As such, resilience or "personality hardiness"⁷ can be regarded as a measure of emotional stamina.⁸ Several workers have suggested that the clinical significance of resilience may lie in its ability to function as an index of overall mental health.^{9,10}

In 1982, Kobasa et al.¹¹ postulated that resilience is a crucial factor in determining how people react to and cope with stressful life events. This theory was later expanded by the suggestion that, when faced with such adverse experiences, resilient people tend to manifest adaptive behavior in the areas of morale, social functioning, and somatic health.^{12,13} Beardslee¹³ proposed that resilient people are "survivors." Indeed, Werner¹⁴ reported that, although

being born into poverty, experiencing perinatal stress, and living in troubled family environments are risk factors for children developing serious learning or behavior problems, resilient individuals who experience these factors can still grow into competent, confident adults. Furthermore, Wagnild^{15(p42)} has suggested that, regardless of an individual's income, resilience may also be associated with "successful aging," defined as "the enjoyment of health and vigor of the mind, body, and spirit into middle age and beyond." Resilient older women have been found to be socially active, with mid-to-high scores for measures of life satisfaction.⁸

Although disturbing life events increase the risk of depression, most people do not become depressed following stressful experiences.¹⁶ Recent research suggests that greater resilience, as measured by the Connor-Davidson Resilience Scale (CD-RISC)⁶ total score, as well as the item of "having a sense of humor when things go badly," is predictive of greater likelihood of recovery in patients with PTSD.¹⁷ Resilience has been shown to protect against posttrauma breakdown and may help to alleviate an individual's feelings of helplessness when faced with pressure or setback.¹⁸ Mental hardiness may help to protect against the development of chronic PTSD following combat.^{19,20} In patients with PTSD treated with fluoxetine, the drug may confer a resilience-building effect and produce clinically significant benefits.¹⁸

The neurobiology of resilience has been reviewed by Charney,²¹ who has included patterns of neurochemical response to acute stress, together with neural mechanisms mediating fear conditioning and extinction, in an integrative model of resilience and vulnerability. Charney described 11 biochemical mediators of response to extreme stress that may be related to resilience or vulnerability, such as cortisol and dopamine. The author further noted that several neurochemicals (dehydroepiandrosterone, neuropeptide Y, galanin, serotonin, benzodiazepine receptors,

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Table 1. Characteristics of Resilience^a

Characteristic	Source
Internal locus of control	Kobasa, 1979 ⁷
Strong sense of commitment to self	
Sense of meaningfulness	
Ability to view change/stress as a challenge	Rutter, 1985 ²³
Engaging the support of others	
Secure attachments to others	
Personal or collective goals	
Self-efficacy	
Sense of humor	
Strong self-esteem	
Action-oriented approach	
Ability to perceive the strengthening effect of stress	
Ability to adapt to change	
Ability to use past successes to confront current challenge	Lyons, 1991 ³
Patience	
Tolerance of negative affect	
Optimism	Connor and Davidson, 2003 ⁶
Faith	

Adapted with permission from Connor and Davidson.⁶

testosterone, and estrogen) may ultimately promote resilience, while the release of others (corticotropin-releasing hormone and the locus ceruleus-norepinephrine system) may tend to undermine resilience. There is also evidence that genetic factors may contribute to stress-related conditions such as PTSD.²²

This article will focus on resilience in patients with PTSD, with 3 main aims: (1) to describe the characteristics of resilience, (2) to examine the currently available methods of assessing and quantifying resilience, and (3) to briefly discuss the use of clinical scales to assess the effect of various treatment strategies on resilience.

CHARACTERISTICS OF RESILIENCE

It is generally agreed that resilience develops over time.¹² The concept of resilience comprises several different elements,^{6,17} and these are listed in Table 1.

The characteristics of resilient people have been studied since the late 1970s, when Kobasa's work⁷ showed that people with greater hardiness also exhibit an internal locus of control, a stronger sense of commitment to self, a sense of meaningfulness, and an ability to view change or stress as a challenge. A variety of other salient features are also associated with resilience. Resilient people are capable of engaging the support of others; forming close, secure attachments with both personal and social networks; and striving toward personal or collective goals.²³ Such individuals exhibit a greater sense of self-efficacy together with a sense of humor when "up against it"; they have strong self-esteem and display an action-oriented approach toward solving problems.²³ Resilient individuals believe that stress can have a strengthening effect, and

they are more capable of adapting to change; they can use past successes to confront current challenges.²³ Other qualities associated with resilience are patience and tolerance of negative affect,³ as well as optimism and faith.⁶

These characteristics are substantiated by numerous studies. In the Kauai Longitudinal Study,¹⁴ individuals were followed for more than 30 years to assess the long-term developmental consequences of perinatal complications and adverse rearing conditions in children. Resilient individuals were characterized by their personal competence and determination, the supportive relationships they had formed, and their reliance on faith and prayer. Resilient youngsters all experienced unconditional acceptance by at least one person, with most establishing this close bond early during their lives.

The beneficial character traits possessed by resilient individuals may be influenced by neural mechanisms relating to reward and motivation (hedonia, optimism, and learned helpfulness), fear and responsiveness (effective behavior in the presence of fear), and adaptive social behavior (altruism, bonding, and teamwork).²¹

Resilient individuals use positive emotions to recover from negative emotional experiences.²⁴ Evaluation of resilience should focus on strengths and positive attributes rather than on weaknesses, thus encouraging the individual to undertake more adaptive pursuits.⁶

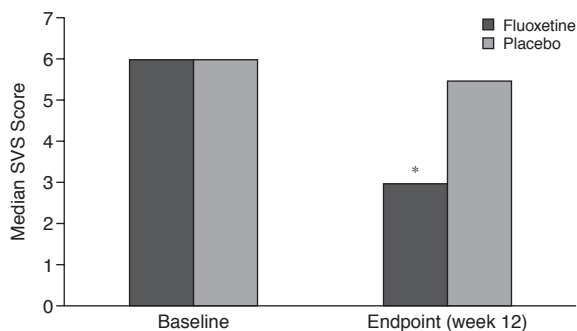
MEASURING RESILIENCE IN PATIENTS WITH PTSD

As observed by Ursano in 1987,^{25(p274)} "The study of responses to trauma must include the study of resilience and health." Although a number of clinical scales have been developed to assess resilience^{26,12} or aspects of resilience,^{7,27} none has gained wide acceptance or established primacy.⁶ Furthermore, the *Handbook of Psychiatric Measures* published in 2000 by the American Psychiatric Association²⁸ did not contain any measures of resilience. Limitations of the previously proposed scales left a clear need for well-validated, easy-to-use systems to be developed.

The CD-RISC can be used to measure various aspects of resilience in patients with PTSD and other allied states, as well as in healthy subjects.⁶ The Stress Vulnerability Scale (SVS) can be used to measure the degree of perceived distress following everyday stress or setbacks.²⁹ Both the SVS and the CD-RISC are easy to use; even individuals without specialized mental health training can be taught to administer these self-rated scales in the field. In addition, both scales can be easily translated into different languages.

The CD-RISC is a brief, self-rated questionnaire used to quantify resilience, establish reference values, and evaluate the clinical effects of pharmacologic treatment on resilience (scale available upon request from the author).⁶ It has solid psychometric properties and is able to distinguish between various degrees of illness severity. The scale consists of 25 items, each of which is rated on a 5-point scale

Figure 1. Effect of Fluoxetine Compared With Placebo on Stress Vulnerability in Patients With Posttraumatic Stress Disorder^a



^aData from Connor et al.¹⁸

* $p < .01$.

Abbreviation: SVS = Stress Vulnerability Scale.

(0–4). Subjects determine their responses according to their feelings during the month prior to assessment. The total score ranges from 0 to 100, with greater resilience reflected in a higher score. When the scale was initially described, mean scores ranged from 80.4 for individuals in the general population to 47.8 for patients with PTSD.⁶ A short, 2-item version of this scale is also available (CD-RISC-2).⁶ Assessment of the reliability, validity, and factor-analytic structure of the CD-RISC found that resilience could be modified and improved by treatment in patients with PTSD, with greater improvements in resilience corresponding to greater degrees of clinical global improvement.⁶

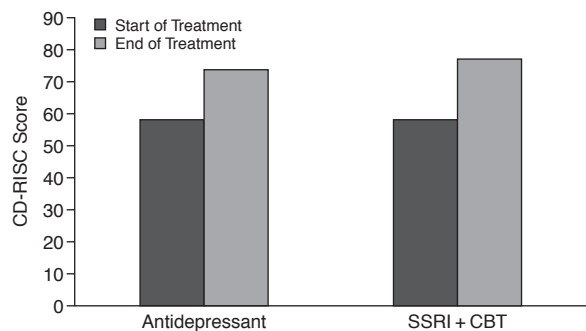
The SVS²⁹ is a 1-item, 11-point, self-rated, visual analog scale, in which higher scores reflect greater stress vulnerability (e.g., impairment in resilience). Using this scale, individuals can measure their stress-coping abilities over the previous week. Results from the SVS have suggested that stress coping is more impaired in individuals with PTSD (mean SVS score = 6.3) than in individuals with other anxiety disorders (mean SVS scores: panic disorder = 5.0, social phobia = 4.8) or in the general population (mean SVS score = 3.8; K.M.C. and J. R. T. Davidson, M.D., unpublished data, July 1, 2005).

ASSESSING THE EFFECT OF TREATMENT ON RESILIENCE

The goals of treatment in patients with PTSD are to alleviate the core symptoms of the disorder and comorbid disorders, strengthen resilience, improve functioning and quality of life, and ultimately achieve remission. As resilience reflects the ability of an individual to cope with stress and adapt in the aftermath of a traumatic event, improved resiliency would be a desirable outcome during treatment, and this outcome does, in fact, occur.¹⁷

Responsiveness to the effects of stress was assessed with the SVS in a randomized, placebo-controlled study of

Figure 2. Effect of Pharmacotherapy or Pharmacotherapy Plus CBT on Resilience in U.S. Patients (N = 80) With Posttraumatic Stress Disorder^a



^aK.M.C. and J. R. T. Davidson, M.D., unpublished data, January 1, 2005.

Abbreviations: CBT = cognitive-behavioral therapy, CD-RISC = Connor-Davidson Resilience Scale, SSRI = selective serotonin reuptake inhibitor.

fluoxetine up to 60 mg/day for 12 weeks.¹⁸ Significantly lower median scores on the SVS scale at week 12 were found in the active drug group compared with the group of patients receiving placebo (3.0 vs. 5.5, $p < .01$; Figure 1). This significant decrease in stress vulnerability implies a “hardiness-promoting” effect of fluoxetine in patients with PTSD, a process referred to elsewhere as *saliostasis*.¹⁷

A recent pilot study¹⁷ reported similarly favorable outcomes using CD-RISC scores to measure response to fluoxetine and various other treatment strategies in patients with PTSD. A statistically significant improvement with treatment was apparent for 19 of the 25 CD-RISC items. The 5 items that exhibited the highest statistical significance (all $p < .0001$) involved gaining confidence from past successes, feeling in control, having the ability to cope with stress, knowing where to turn for help, and being able to adapt to change. It was suggested that the 2 core items most closely reflective of resilience were being able to adapt to change and tending to bounce back after illness or hardship.

In another study evaluating resilience in patients with PTSD, the median baseline CD-RISC score was 58 (U.S. population reference score = 80).⁶ Subjects receiving antidepressant medication in conjunction with participation in several clinical trials of PTSD were compared with those who received combined treatment with a selective serotonin reuptake inhibitor and cognitive-behavioral therapy. At the end of treatment, median CD-RISC scores increased to 74 and 77, respectively (Figure 2; K.M.C. and J. R. T. Davidson, M.D., unpublished data, January 1, 2005). These findings demonstrate substantial improvement in resilience after either pharmacotherapy or combined pharmacotherapy and psychotherapy in persons with PTSD to a level close to that observed in the general population.

Studies such as these highlight how the use of these clinical scales is enabling research to assess the efficacy of different treatments for PTSD. Data confirm that the treatment of PTSD can significantly improve resilience and thus reduce the severity of symptoms associated with the disorder. It is not currently known how psychotherapy compares to pharmacotherapy with regard to improving resilience in patients with PTSD. However, our increased understanding of resilience and our growing ability to monitor and assess its various components may help to suggest appropriate treatment interventions for individuals who do not fare well after trauma.³

DISCUSSION AND CONCLUSIONS

Resilience is an important area for mental health research in general and trauma research in particular. Interpreting data in this field, however, can be difficult. Resilience itself is a complex notion that is not easily reduced to any single construct and that incorporates such dimensions as coping mechanisms and personality. Further, the impact of posttraumatic symptoms on coping is unknown. The influence of this complex relationship complicates the determination of the direction of effect. These challenges have been demonstrated in studies of coping and personality in PTSD, in which there is considerable evidence about the impact of symptoms on coping measures and personality dimensions.³⁰⁻³⁴ As a result, cross-sectional associations can be difficult to interpret in the area of study of resilience. Longitudinal studies are therefore needed to provide a prospective evaluation of the impact of characteristics thought to be indicative of resilience and to examine predictors of symptom course.

These issues notwithstanding, characteristics of resilience can be measured in patients with PTSD, as can perceived reactivity to daily stressors. Moreover, these measures can be conveniently administered by nonspecialists, who can be taught about their use within a short period of time. Although impaired in patients with PTSD, resilience can improve over time. However, longitudinal studies are needed to further our understanding of the relationships between resilience and the impact of posttraumatic symptoms on coping and of resilience as a predictor of outcome.

Drug name: fluoxetine (Prozac and others).

Disclosure of off-label usage: The author has determined that, to the best of her knowledge, fluoxetine is not approved by the U.S. Food and Drug Administration for the treatment of posttraumatic stress disorder.

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