Evaluation of a Resilience Intervention to Enhance Coping Strategies and Protective Factors and Decrease Symptomatology

Article *in* Journal of American College Health · January 2008

DOI: 10.3200/JACH.56.44.445-454 · Source: PubMed

2 authors:

Mary A Steinhardt
University of Texas at Austin
77 PUBLICATIONS **5,288** CITATIONS
SEE PROFILE

Christyn L Dolbier
East Carolina University
41 PUBLICATIONS **3,330** CITATIONS
SEE PROFILE

Evaluation of a Resilience Intervention to Enhance Coping Strategies and Protective Factors and Decrease Symptomatology

Mary Steinhardt, EdD, LPC; Christyn Dolbier, PhD

Abstract. **Objective**: In this pilot study, the authors examined the effectiveness of a 4-week resilience intervention to enhance resilience, coping strategies, and protective factors, as well as decrease symptomatology during a period of increased academic stress. **Participants** and **Methods**: College students were randomly assigned to experimental (n = 30) and wait-list control (n = 27) groups. The experimental group received a psychoeducational intervention in 4 two-hour weekly sessions. Measures of resilience, coping strategies, protective factors, and symptomatology were administered pre- and postintervention to both groups. **Results**: Analyses indicated that the experimental group had significantly higher resilience scores, more effective coping strategies (ie, higher problem solving, lower avoidant), higher scores on protective factors (ie, positive affect, self-esteem, self-leadership), and lower scores on symptomatology (ie, depressive symptoms, negative affect, perceived stress) postintervention than did the wait-list control group. **Conclusions**: These findings indicate that this resilience program may be useful as a stress-management and stress-prevention intervention for college students.

Keywords: coping strategies, protective factors, resilience, stress, symptomatology

While undergoing the transition from adolescence to adulthood, college students experience many challenges that can ultimately affect their health. Reports of psychological stress in this population are increasing steadily[1] and result from stressors as numerous and varied as intrapersonal (eg, changes in sleeping and eating habits), academic (eg, increased class workload), interpersonal (eg, change in social activities), and environmental (eg, computer problems).[2] Exposure to these stressors coupled with students' developmental gaps in coping ability make this population particularly vulnerable to resultant psychological and physical health problems.[3]

In their theory of stress and coping, Lazarus and Folkman[4] define *stress* as a transaction between the person and the environment, whereby individuals appraise environmental demands as outweighing their abilities to meet those demands. *Resilience* is the ability to recover quickly from disruptions in functioning that result from stress appraisals and to return to the previous level of functioning.[5,6] The concept of resilience has received increased attention over the years from researchers studying why some individuals in populations experiencing adversity do not succumb to those difficult circumstances. Although these investigators focused primarily on children, aging adults, and the workforce, given the increased levels of stress experienced by college students, resilience theory and research have the potential to enhance understanding of this population and provide insight into possible interventions.

In college students, succumbing to stress is characterized by detriments to psychological functioning—such as symptoms of anxiety[7,8] and depression[7]—as well as physical functioning, such as symptoms and frequency of illness[9,10] and somatization.[7] Maladaptive efforts to cope with stressful situations may contribute to or exacerbate symptomatology.[7] In particular, emotion-oriented and avoidant coping strategies typically result in negative psychological and physical outcomes.[7,11]

According to the protective factor model of resilience, a protective factor interacts with a stressor to reduce the likelihood of negative outcomes such as those described previously.[12] Researchers have identified a number of protective factors, including but not limited to hardiness,[13] self-esteem,[14] social support,[15] optimism,[16] and positive affect.[17] In addition, research suggests that some coping strategies

Prof Steinhardt *is with The University of Texas at Austin's Kinesiology and Health Education Department, and* ***Prof Dolbier*** *is with East Carolina University's Department of Psychology.*

are protective in that they enable an individual to cope with the stressful situation successfully and recover. For example, broad-minded coping strategies lead to greater positive affect.[18]

Increasing numbers of researchers have evaluated the effectiveness of stress management programs for college students. Such interventions aimed at reducing stress and improving health have significantly decreased symptoms of anxiety[19–21] and depression,[21] psychological distress,[19,22] and perceptions of stress.[19] These interventions have incorporated several modalities singly or in combination, including relaxation techniques,[19–21] cognitive–behavioral therapy,[19,20,22] social support,[21,22] and psychoeducation.[19–21] Relaxation techniques (eg, diaphragmatic breathing, muscle relaxation, imagery, meditation, biofeedback) are designed to reduce the physiological stress response so that the negative effects on well-being that these responses can have are reduced or eliminated. Cognitive–behavioral strategies focus on identifying and changing maladaptive thinking (eg, all-or-none, perfectionistic, overgeneralization, catastrophizing, self-punishing) and behavior (eg, alcohol use, smoking, drug use) that can create stress and exacerbate its negative effects. The social support modality provides an empathic, safe environment where individuals are encouraged to share their experiences, thoughts, and feelings; social support is often referred to as a buffer against the negative effects of stress. Psychoeducation increases personal knowledge about the causes of and contributors to stress and the cognitive, emotional, behavioral, and physiological effects of stress. The intervention we evaluated in the current pilot study included 3 of these modalities: cognitive–behavioral therapy, social support, and psychoeducation.

Our purpose was to assess the effectiveness of an intervention designed to enhance participants' resilience, adaptive coping strategies, and protective factors, as well as decrease maladaptive coping strategies and psychological and psychosomatic symptomatology during a period of increased academic stress. The intervention included a psychoeducational component as well as aspects of cognitive–behavioral therapy,[23] rational–emotive therapy,[24] and internal family systems therapy.[25] It drew on the transactional model of stress and coping[4] and resilience and thriving models[5,6] and was based on empirical research on stress, coping, and protective factors. Our intention was to intervene earlier in the cascade leading from stressful situations to illness by focusing on thoughts that often create stress (eg, perceiving a situation as a threat rather than a challenge), behaviors that exacerbate stress, and personalized knowledge about types, causes, and effects of stress that can enable individuals to better manage their stress. We also aimed to address weaknesses of previous intervention studies by using a randomized controlled design and validated outcome measures.[19] We hypothesized that college students who attended a 4-week resilience intervention would demonstrate enhanced resilience, coping skills, and protective factors, as well as decreased symptomatology, compared with those in a wait-list control group.

METHODS

Sample

Participants were university students recruited to take part in a resilience program to learn how to manage change and difficult situations more effectively. We recruited 64 students and randomly assigned them to experimental (n = 31) and wait-list control (n = 33) groups. Before they completed a preintervention survey, we informed all participants of the confidential nature and purpose of the study in accordance with Internal Review Board procedures of the sponsoring institution, and they voluntarily provided informed consent. Seven participants ceased participation prior to completing the postintervention survey (1 experimental, 6 wait-list control); thus, the final sample size of 57 (30 experimental, 27 wait-list control) yielded a participation rate of 89%. The majority of students were undergraduates (64.9%), with equal percentages of masters (17.5%) and doctoral (17.5%) students. Eighty-two percent were women, and 18% were men, ranging in age from 18 to 53 years, with a median of 21 years. The sample was 43.9% Caucasian, 26.3% Asian, 19.3% Hispanic, 5.3% African American, and 5.2% self-identified as other. The experimental and wait-list control groups did not significantly differ on any of the demographic variables. The university population from which the sample was drawn has 49,697 students (51% women and 49% men, with a mean age of 22.7 years); the ethnic distribution is 57% Caucasian, 14% Asian, 15% Hispanic, 9% foreign, 4% African American, and 1% other; the majority of students are undergraduates (74%), with approximately equal percentages of masters (12%) and doctoral (10%) students. The remaining students (4%) are enrolled in law and PharmD programs.

Procedure

Students volunteered by e-mail in response to flyers that were posted around campus and sent electronically to academic advising offices. We informed potential participants that they would be randomly assigned to 1 of 2 groups: (1) the experimental group involved completing a preintervention survey, attending weekly intervention sessions (4 sessions, 2 hours each) during the final weeks of classes, and completing a postintervention survey a week after the final class session; and (2) the wait-list control group involved completing pre- and postintervention surveys on the same days as the experimental group and then attending a condensed 4-hour version of the intervention after classes were completed. All surveys were administered in a quiet classroom setting and required approximately 30 minutes to complete. Because we expected that finding participants during this stressful time of the semester would be difficult, we compensated participants $10 after completion of the preintervention survey and $10 after completion of the postintervention survey. We compensated participants in the experimental group an additional $15 if they attended all 4 intervention sessions. We gave participants in the wait-list control group inspirational quote cards valued at $10 for their optional attendance in the intervention after classes were completed.

Resilience Intervention

The resilience intervention, Transforming Lives Through Resilience Education, included 4 two-hour classroom sessions: (1) Transforming Stress Into Resilience, (2) Taking Responsibility, (3) Focusing on Empowering Interpretations, and (4) Creating Meaningful Connections. A modified version of this 4-session resilience curriculum is available online.[26]

The first session, Transforming Stress Into Resilience, presented a resilience model based on the work of O'Leary and Ickovics[6] and Carver[5] and discussed 4 typical responses to stress, including give up, put up, bounce up, and step up (see Figure 1). Individuals who give up succumb to the stressful situation and feel defeated. Individuals who put up struggle with the stressful situation; although their level of well-being is diminished, it is higher than the well-being of those who give up. Individuals who bounce up fully recover from the stressful situation back to their prior level of functioning, which we call *resilience*. Last, individuals who step up do whatever it takes to meet the challenge and grow to an even higher level of functioning and well-being than previously experienced, which we call *thriving*. As the intervention progressed, we presented new information and activities within the context of this resilience model to reinforce core content.

During the first session, we also discussed 2 broad categories of coping—problem-focused and emotion-focused, which linked to the 4 responses in the resilience model. We encouraged problem-focused coping strategies (ie, active coping, planning, positive reframing, acceptance), which would help students solve stressful situations inside their circle of influence. We encouraged the use of emotion-focused coping strategies (ie, denial, behavioral disengagement, self-distraction, venting) when students felt overwhelmed in the short-term or when a stressful situation was outside their circle of influence. Used long-term, problem-focused coping is linked to bounce up and step up in our resilience model, and emotion-focused coping is linked to give up and put up.

Session 2 (Taking Responsibility) presented a responsibility model in which a line was drawn between taking and not taking responsibility for one's behavior. *Taking responsibility*, defined as owning one's power to choose and create, was *above the line* and focused on situations of concern that were within one's circle of influence.[27] Being *below the line* was characterized by responses to situations of concern perceived to be outside one's circle of influence. We presented denying, blaming, making excuses, and shaming as examples of below-the-line responses; such responses shrink one's circle of influence. Last, participants engaged in a 5-step process to help move above the line and take responsibility for managing their stressful situations. We described taking responsibility as being intimately linked with self-esteem.[28]

Session 3 (Focusing on Empowering Interpretations) helped participants change their disempowering interpretations or thinking into empowering interpretations using a simple *ABCDE* thinking model based on the work of Albert Ellis.[24] According to this model, *A* stands for the activating event or stressor; *B* stands for belief and represents the disempowering interpretations or negative thoughts about the

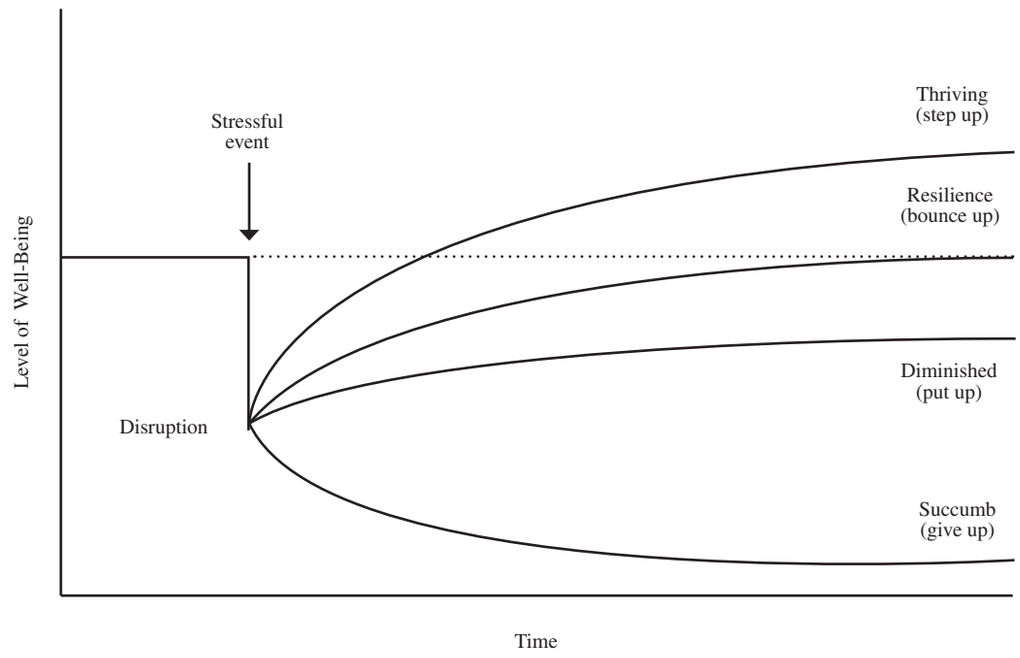

FIGURE 1. The resilience model taught in the curriculum, *Transforming Lives Through Resilience Education*, based on the work of Carver[5] and O'Leary and Ickovics.[6]

activating event; *C* stands for consequence and represents how one feels and behaves in response to one's beliefs or thoughts; *D* stands for disputing the disempowering beliefs or interpretations and creating empowering interpretations of the situation (if necessary, *D* also stands for distracting or distancing oneself momentarily from the situation); and *E* stands for the amount of energy one has available to handle the activating event. Participants become aware that their negative, disempowering interpretations of the stressful situations in their lives are linked to below-the-line responses in the responsibility model. Conversely, positive (albeit realistic) empowering interpretations are linked to above-the-line behavior in the responsibility model.

Session 4 (Creating Meaningful Connections) focused on increasing participants' awareness of the link between connecting with or withdrawing from friends and loved ones and the corresponding impact on thinking, behavior, and health. Research indicates that a person's health and well-being are directly related to how well they connect with others and allow support during stressful situations.[29] Further, the curriculum proposes that individuals who create meaningful connections with others are more likely to think in empowering ways, move above the line, and take responsibility.

The final part of session 4 focused on the concept of self-leadership based on the internal family systems model, which describes an individual as a complex system with multiple subpersonalities (eg, the achiever, the caretaker, the critic).[25,30] *Self-leadership* is the extent to which this system is operated by a core Self—an active yet compassionate inner leader with perspective and vision. Rather than a passive observer or witness, the Self is similar to the best teacher, coach, mentor, or parent one has ever experienced or can imagine. When the Self is leading, one experiences more and more of 9 characteristics (ie, calm, clarity, curiosity, compassion, confidence, courage, creativity, connectedness, contentment), and the various subpersonalities develop and relate to one another in a more harmonious way. This active leading by the Self provides a safe and nurturing environment within oneself and thus enables one to bounce up and maintain homeostasis and well-being, as well as transform stressful situations into opportunities for enhanced resilience and personal growth or thriving. Participants were taught that experiencing self-leadership is essential to taking responsibility, focusing on empowering interpretations, and creating meaningful connections.

Measures

The pre- and postintervention surveys included measures of resilience, coping strategies, protective resources (ie, optimism, positive affect, self-esteem, self-leadership), and symptomatology (ie, depressive symptoms, negative affect, perceived stress, symptoms of illness). Because of our interest in assessing the impact of the 4-week intervention on changing participants' cognitive, emotional, and behavioral ways of responding during the most stressful time of the semester, we asked participants to answer each survey item with respect to the previous week.

Resilience

Dispositional Resilience Scale

We selected the 30-item Dispositional Resilience Scale (DRS) as a measure of resilience because it assesses the presence of 3 important tendencies that characterize hardiness: challenge, commitment, and control.[31] Hardy (ie, resilient) individuals perceive change as a challenge, are committed to the people and activities in which they are involved, and perceive a sense of personal control in handling life events.[13] Respondents replied using a 4-point Likert scale ranging from 0 (*not true at all*) to 3 (*completely true*) to items such as "By working hard you can always achieve your goals" and "Changes in my routine are interesting to me." The internal consistency of the DRS for the current study was $\alpha = .73$.

Connor–Davidson Resilience Scale

Researchers[32] developed the 25-item Connor–Davidson Resilience Scale (CD–RISC) as a clinical measure to assess the positive effects of treatment for stress reactions, anxiety, and depression. We chose this scale because it includes items that represent not only challenge, commitment, and control but also a variety of other resiliency characteristics, such as goal setting, patience, faith, tolerance of negative affect, and humor. Respondents replied using a 5-point Likert scale ranging from 0 (*not true at all*) to 4 (*true nearly all the time*). Sample items included "I am able to handle unpleasant or painful feelings like sadness, fear and anger" and "Under pressure, I stay focused and think clearly." The internal consistency of the CD–RISC for the current study was $\alpha = .89$.

Coping Strategies

Coping strategies are individuals' behavioral and cognitive responses to stressful situations. We assessed coping strategies using the 28-item Brief Coping Orientations to Problems Experienced (Brief COPE) scale.[33] The Brief COPE measures a broad range of cognitive and behavioral coping strategies that individuals typically use in stressful situations. It includes 14 two-item subscales: active coping, planning, positive reframing, acceptance, humor, religion, emotional support, instrumental support, self-distraction, denial, venting, substance use, behavioral disengagement, and self-blame. For each of the items, respondents indicated the extent to which they used the strategy in dealing with stressful situations on a 4-point Likert scale ranging from 1 (*not at all*) to 4 (*a lot*).

Theory proposes that the 14 coping strategies assessed by these subscales are part of several larger constructs (eg, problem-focused, emotion-focused, approach, avoidance, transformative, and regressive coping); however, researchers have warned against the practice of assuming that certain coping strategies are always grouped in the same way across different contexts.[4] Therefore, we conducted a factor analysis to see how the subscales grouped together to form broader coping constructs in college students. Given the number of subscales, our sample size was

not large enough to adequately conduct a factor analysis. Thus, we used a larger sample of college students (n = 114) who completed the Brief COPE to conduct the factor analysis. These students were recruited from undergraduate psychology classes. The majority of students were female (70.2%) and Caucasian (70.2%), aged between 18 and 32 years.

We conducted a principal axis factor analysis with varimax rotation using the 14 subscales of the Brief COPE. We sequentially deleted subscales with communalities less than .25, which resulted in 12 subscales loading greater than .40 on 4 factors. Factor 1 consisted of the subscales emotional support, instrumental support, and venting, and we named it support coping (α = .80). Factor 2 included the subscales denial, behavioral disengagement, and self-blame, and we named it avoidant coping (α = .75). Factor 3 included the subscales active, planning, and acceptance, and we named it problem-solving coping (α = .71). Factor 4 consisted of the subscales positive reframing, religion, and substance use (which we reversed scored), and we referred to it as hopeful coping (α = .75). All 4 factors accounted for 49.7% of the total variance explained. The internal consistencies of these 4 factors were adequate for the current study (N = 57) at above .70, with the exception of problem-solving coping (α = .62).

Protective Factors

Optimism

Optimism is the tendency across time and context to have positive expectations, and we measured it using the revised Life Orientation Test (LOT-R).[34] The LOT-R consists of 6 items, plus 4 filler items designed to disguise the content of the scale. Respondents indicated on a 5-point Likert scale ranging from 0 (*strongly disagree*) to 4 (*strongly agree*) the extent to which they agreed with items such as "In uncertain times, I usually expect the best" and "Overall, I expect more good things to happen to me than bad." The internal consistency of the LOT-R for the current study was α = .72.

Positive Affect

Positive affect is experiencing positive feelings and emotions that reflect general levels of energy and enthusiasm and has been closely associated with extraversion. We measured it using a 19-item modified version of the Positive and Negative Affect Schedule (PANAS).[35] This modified scale consists of the original 10 items included in the PANAS plus 9 affective terms (ie, amused, calm, content, curious, happy, relaxed, relieved, satisfied, surprised) added by Tugade and Fredrickson.[36] On a 5-point Likert scale ranging from 1 (*not at all*) to 5 (*very much so*), respondents indicated to what extent they generally felt various positive feelings and emotions such as enthusiastic and interested. The internal consistency for the current study was α = .90.

Self-Esteem

We used the 10-item Rosenberg Self-Esteem Scale (RSES) to measure self-esteem.[37] Participants indicated on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) the extent to which they agreed with such items as "I feel I have a number of good qualities" and "I feel I am a person of worth, at least on an equal plane with others." The internal consistency of the RSES for the current study was α = .90.

Self-Leadership

The concept of self-leadership comes from the internal family systems model, which describes an individual as a complex system with multiple subpersonalities.[25] The brief 20-item Self-Leadership Scale (SLS) used in this study instructed participants to indicate their frequency of experiencing such sentiments as "I feel a sense of inner peace" and "I treat myself with kindness" on a 5-point Likert scale ranging from 1 (*never/almost never*) to 5 (*always/almost always*).[38] The internal consistency for the current study was α = .92.

Symptomatology

Depressive Symptoms

We measured depressive symptoms using the 20-item Center for Epidemiologic Studies Depression Index (CES-D).[39] Respondents indicated on a 4-point Likert scale ranging from 0 (*rarely or none of the time – less than 1 day*) to 3 (*all of the time – 5 to 7 days*) the extent to which they experienced various depressive symptoms during the past week such as, "I felt that everything I did was an effort" and "I had crying spells." The internal consistency of the CES-D for the current study was α = .89.

Negative Affect

We measured negative affect using a 19-item modified version of the PANAS.[35] This modified scale consists of the original 10 items included in the PANAS plus 9 affective terms (ie, angry, anxious, blue, depressed, disappointed, discouraged, disgusted, sad, tired) added by Tugade and Fredrickson.[36] On a 5-point Likert scale ranging from 1 (*not at all*) to 5 (*very much so*), respondents indicated to what extent they generally felt various negative feelings and emotions such as distressed and irritable. The internal consistency for the current study was α = .92.

Perceived Stress

Perceived stress is the degree to which situations in one's life are perceived as stressful, as measured by the 4-item version of the Perceived Stress Scale (PSS).[40] Using a 5-point Likert scale ranging from 0 (*never*) to 4 (*very often*), respondents indicated the extent to which they experienced feelings such as "Felt that you were unable to control the important things in your life" and "Felt difficulties were piling up so high that you could not overcome them." The internal consistency of the PSS for the current study was α = .85.

Symptoms of Illness

We measured psychosomatic symptoms of illness with the Symptoms Checklist, which includes 20 items assessing the extent to which participants experience various physical and psychological symptoms.[31] Using a 4-point Likert scale ranging from 0 (*none*) to 3 (*very often*), respondents

indicated how often they experienced such symptoms as common cold or flu and feeling nervous or tense. The internal consistency for the current study was $\alpha = .85$.

Data Analysis

We calculated descriptive statistics, including means and standard deviations for experimental and wait-list control groups, for all variables pre- and postintervention. We conducted independent *t* tests to determine whether there were any systematic differences between the groups prior to the intervention. We also conducted a series of four 2 × 2 repeated measures multivariate analyses of variance (MANOVAs). Each MANOVA included the between-subjects factor of group (experimental vs wait-list control), the within-subjects factor of time (preintervention vs postintervention), and the Group × Time interaction. The interaction is the primary effect of interest, as a significant effect would support the idea that the 2 groups differ in their degree of change from preintervention to postintervention. We used repeated-measures MANOVAs to analyze a different set of conceptually related dependent variables. The first MANOVA included the resilience variables (ie, DRS, CD–RISC), the second included the coping strategies (ie, support, avoidant, problem-solving, hopeful coping factors), the third included the protective factors (ie, optimism, positive affect, self-esteem, self-leadership), and the fourth included the symptomatology variables (ie, depressive symptoms, negative affect, perceived stress, symptoms of illness). For each MANOVA, if the overall multivariate Group × Time effect was significant, we conducted univariate repeated measures follow-up tests to examine the interaction effect separately for each dependent variable. We based the *F* ratios for each multivariate test on Wilks's approximation. We also calculated Pearson product–moment correlation coefficients to examine the linear relationships among the dependent variables included in each MANOVA.

RESULTS

Table 1 shows the means and standard deviations for all variables and summarizes the results of the univariate repeated measures tests for the Group × Time effect. Independent *t* tests revealed no significant differences between the experimental and wait-list control groups for any of the preintervention study variables.

For the first repeated measures MANOVA, correlations between the 2 resilience measures were moderate ($r = .39$ preintervention, $r = .46$ postintervention). The multivariate tests for the MANOVA yielded a significant main effect for time ($F[2, 54] = 5.78$, $p < .01$), a nonsignificant main effect for group ($F[2, 54] = .36$, $p = .70$), and a significant Group × Time interaction ($F[2, 54] = 7.13$, $p < .01$). Univariate follow-up analyses indicated a significant Group × Time effect for both the DRS ($F[1, 55] = 10.55$, $p < .01$) and the CD–RISC ($F[1, 55] = 10.07$, $p < .01$). The experimental group had significantly higher resilience scores on both measures postintervention than did the wait-list control group.

We included the coping strategy dependent variables (ie, support, avoidant, problem-solving, hopeful) in the

TABLE 1. MANOVA Results for Resilience, Coping Strategies, Protective Factors, and Symptomatology

	Experimental (n = 30)				Wait-list control (n = 27)			
	Pre		Post		Pre		Post	
Variable	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Resilience								
DRS***	56.93	8.14	61.43	6.05	57.89	7.77	57.27	8.65
CD–RISC***	67.70	10.05	75.30	8.38	70.56	12.29	70.59	11.70
Coping strategy								
Support	17.17	3.31	17.20	3.27	16.41	4.11	16.56	4.31
Avoidant***	9.77	2.81	8.27	2.25	9.78	3.13	10.44	3.57
Problem solving***	18.67	2.77	20.37	2.71	19.59	2.27	19.11	3.02
Hopeful*	17.63	3.91	18.80	2.88	18.00	3.53	18.00	3.00
Protective factor								
Optimism*	15.17	3.57	16.65	3.09	15.89	3.89	16.26	3.54
Positive affect***	55.20	13.10	63.53	11.98	59.96	11.61	60.07	13.54
Self-esteem***	38.83	7.20	41.53	5.42	39.67	7.02	38.59	7.42
Self-leadership***	68.40	12.81	75.83	9.31	69.86	13.54	68.30	16.06
Symptomatology								
Depressive symptoms***	18.23	11.01	12.33	6.37	17.30	9.44	17.52	10.45
Negative affect***	50.63	15.67	42.43	11.00	47.74	14.74	49.22	18.89
Perceived stress**	6.83	3.60	4.83	2.50	6.48	3.50	6.52	3.89
Symptoms of illness	13.77	8.69	11.57	7.48	13.30	8.40	14.07	8.99

Note. MANOVA = multivariate analysis of variance; DRS = Dispositional Resilience Scale; CD–RISC = Connor–Davidson Resilience Scale.
*$p < .10$. **$p < .05$. ***$p < .01$.

second repeated measures MANOVA; correlations among the coping factors ranged from small to moderate (r = .07 to .37 preintervention, r = –.14 to .31 postintervention). The multivariate tests for the MANOVA yielded a marginally significant main effect for time (F[4, 52] = 1.29, p = .09), a marginally significant main effect for group (F[4, 52] = 1.04, p = .07), and a significant Group × Time interaction (F[4, 52] = 3.84, p < .01). Univariate follow-up analyses indicated a significant Group × Time effect for avoidant coping (F[1, 55] = 8.66, p < .01) and problem-solving coping (F[1, 55] = 7.67, p < .01), a marginally significant Group × Time effect for hopeful coping (F[1, 55] = 3.72, p = .06), and a nonsignificant Group × Time effect for support coping (F[1, 55] = 0.02, p = .90). The experimental group had significantly lower avoidant coping scores and significantly higher problem-solving coping scores postintervention than did the wait-list control group.

The third repeated measures MANOVA included the protective-factor dependent variables (ie, optimism, positive affect, self-esteem, self-leadership); correlations among the protective factors ranged from moderate to high (r = .28 to .71 preintervention, r = .29 to .72 postintervention). The multivariate tests for the MANOVA yielded a marginally significant main effect for time (F[4, 51] = 2.37, p = .06), a nonsignificant main effect for group (F[4, 51] = 1.00, p = .41), and a significant Group × Time interaction (F[4,51] = 2.98, p < .05). Univariate follow-up analyses revealed a significant Group × Time effect for self-esteem (F[1, 54] = 8.65, p < .01), self-leadership (F[1, 54] = 10.43, p < .01), and positive affect (F[1, 54] = 6.68, p < .05), and a marginally significant Group × Time effect for optimism (F[1, 54] = 2.81, p = .10). The experimental group scored significantly higher on self-esteem, self-leadership, and positive affect postintervention than did the wait-list control group.

The final repeated measures MANOVA included the symptomatology dependent variables (ie, depressive symptoms, negative affect, perceived stress, symptoms of illness); correlations among the symptomatology variables ranged from moderate to high (r = .56 to .85 preintervention, r = .50 to .88 postintervention). The multivariate tests for the MANOVA yielded a marginally significant main effect for time (F[4, 52] = 2.37, p = .06), a nonsignificant main effect for group (F[4, 52] = 0.32, p = .86), and a significant Group × Time interaction (F[4, 52] = 2.63, p < .05). Univariate follow-up analyses revealed a significant Group × Time effect for depressive symptoms (F[1, 55] = 9.31, p < .01), negative affect (F[1, 55] = 7.62, p < .01), and perceived stress (F[1, 55] = 5.89, p < .05), and a nonsignificant Group × Time effect for symptoms of illness (F[1, 55] = 2.38, p = .13). The experimental group scored significantly lower on depressive symptoms, negative affect, and perceived stress postintervention than did the wait-list control group.

COMMENT

In this pilot study, we examined the effectiveness of a 4-week resilience intervention during a period of increased academic stress (ie, the final weeks of classes). Findings indicated that the experimental group had greater resilience and more effective coping strategies (ie, higher problem-solving and lower avoidant coping) postintervention than did the wait-list control group. In addition, the experimental group had higher postintervention scores on the protective factors of self-esteem, self-leadership, and positive affect and lower scores on symptomatology, including depressive symptoms, negative affect, and perceived stress. Given the steady increase in psychological stress[1] and its corresponding negative effects among college students,[7,10] interventions that enable students to successfully manage stress, such as the one described here, are needed.

A strength of the current study is that instead of imposing traditional categorizations of problem- and emotion-focused coping on the coping subscales a priori, we factor analyzed the subscales to allow college student responses to determine subscale categorization.[4] With respect to the 2 coping factors that demonstrated change in the experimental versus control group, the problem-solving coping factor (comprising active coping, planning, and acceptance) is similar to what is traditionally conceptualized as problem-focused coping and the avoidant coping factor (comprising denial, behavioral disengagement, and self-blame) is similar to what is commonly described as emotion-focused coping.[41] Despite being only marginally significant, the hopeful coping factor's (comprising reverse-scored substance use, positive reframing, and religion) underlying theme of having or losing hope is consistent with the emerging focus on positive and meaning-based coping.[42] It is surprising that the support coping factor was not significant; however, this may reflect students' tendencies to cram for exams alone rather than in groups during the end of the semester.

Compared with the control group, the experimental group showed improvement in resilience and the protective factors (ie, positive affect, self-esteem, and self-leadership) with the exception of optimism. The curriculum intervention emphasized the importance of protective factors in both managing and preventing stress. A more traditional reactive stress-management approach emphasizes the importance of protective factors in helping to cope effectively with current stressful situations in one's life to buffer against negative outcomes. In addition, we emphasized a more proactive stress-prevention approach in which protective factors enable future stressors to be perceived as less stressful and coped with more effectively.[43] In this way, the protective factors help manage stress once it is perceived and lead to fewer initial perceptions of stress. The protective factor of optimism shifted in the intended direction but was only marginally significant. This might have been due to the curriculum's emphasis on accepting the reality of stressful situations and, within that reality, using appropriate coping strategies.

The intervention appeared to be effective in reducing psychological symptomatology (ie, depressive symptoms, negative affect, and perceived stress) but not psychosomatic symptomatology (ie, symptoms of illness) over the previous week. However, the Group × Time effect for symptoms

of illness was in the expected direction, with the control group increasing in symptoms of illness by an average of less than 1 point and the intervention group decreasing in symptoms of illness by an average of 2 points pre- to postintervention. In general, stressful circumstances are thought to initially result in negative emotional responses (eg, symptoms of depression and anxiety), which lead to physiological responses (eg, cardiovascular, immune) or behavioral responses (eg, smoking, alcohol use) that ultimately increase the risk of physical disease.[44] Given the intervention's efficacy in improving earlier events in the cascade from stress to illness (ie, depressive symptoms, behavioral coping strategies), the nonsignificant results likely are due to either the noted time lag between the experience of stressful situations and subsequent manifestation of illness[43] or the small sample size. Supporting this time lag supposition is the finding that the control group did not report significantly greater symptoms of illness over the stressful final week of classes.

The results of this pilot study should be considered in light of several limitations. First is the relatively small size of the sample, which may have been a contributing factor in several nonsignificant results. Although the sample size was small, the majority of the outcomes demonstrated significant changes in the expected direction. Second, although there were no differences in demographic composition between groups, substantially fewer men than women participated, such that we could not examine sex differences in the experimental outcomes. Researchers in future investigations should include larger samples with enough participants of each sex to allow for examination of sex differences in experimental outcomes. Third, we did not randomly select participants from the population, a process that is often not feasible in social science research. Thus, the sample may not be representative of the population from which it was drawn, which has implications for the generalizability of the results. When possible, future intervention researchers should randomly select from the target population to increase the external validity of study results.

A fourth limitation of the study is that for most of the instruments, we changed the time frames used as the frame of reference so that participants responded with regard to the previous week. This change was necessary to ensure that participants were considering how they felt, thought, and behaved after the intervention and not during or before it. The original CES-D uses a 1-week time frame, and the Brief COPE was designed to be used dispositionally or situationally—thus, their timeframes were not changed. As originally published, the LOT-R, DRS, CD–RISC, RSES, and SLS measure a respondent's disposition or general tendencies. The PANAS can be used as a dispositional or state measure, the PSS uses a 1-month time frame, and the Symptoms Checklist uses a time frame of the past few weeks. The psychometric properties of the measures cannot be assured given a change in time frame used; however, the reliabilities of the measures were adequate, and their correlations with measures of related concepts support their construct validity.

Last, the use of self-report survey data has inherent limitations. Questionnaire responses might have been untruthful due to social desirability or inaccurate because of lack of self-awareness. Future intervention researchers could improve on the limitations of self-report by including objective observations of behavior, biological markers of stress such as cortisol, or objective health outcomes such as verifiable illness.

We propose several recommendations for future research on the basis of previous intervention studies and this study. First, future investigators should address the long-term effects of stress-management interventions,[20,21] their health implications, the sustainability of effects over time, and whether students need continued support to maintain benefits.[19] Second, researchers should examine explanatory mechanisms of how the interventions work.[21] For instance, we assessed several facets of a theoretical causal pathway from stressful situations to illness (ie, perceived stress, negative emotional states, coping behaviors, and symptoms of illness); future research should continue to assess these aspects and add biological indicators of the processes involved in the stress–illness relationship, such as cardiovascular, neuroendocrine, or immune activity. Another focus for future research is whether effects are specific to certain types of interventions or modalities.[20,21] Last, intervention implementation (eg, individual or group sessions)[20] and maximization of participant retention (eg, effectiveness of online interventions) are areas needing further research.[19]

ACKNOWLEDGMENT

This research project was funded in part by a Field-Based Funding Initiative, College of Education, University of Texas at Austin. The authors thank Shanna Smith, PhD, Division of Statistics and Scientific Computation at the University of Texas at Austin, for contributing her statistical expertise. They also thank Jennifer Krueger and Megan Rooney, graduate students at the University of Texas at Austin who assisted with the completion of this project.

NOTE

For comments and further information, address correspondence to Prof Mary Steinhardt, University of Texas at Austin, Kinesiology and Health Education, Bellmont Hall 222, Austin, TX 78710, USA (e-mail: msteinhardt@mail.utexas.edu).

REFERENCES

1. Sax LJ. Health trends among college freshman. *J Am Coll Health*. 1997;45:252–262.

2. Ross SE, Niebling BC, Heckert TM. Sources of stress among college students. *Coll Stud J*. 1999;33:312–317.

3. Diehl M, Coyle N, Labouvie-Vief G. Age and sex differences in strategies of coping and defense across the life span. *Psychol Aging*. 1996;11:127–139.

4. Lazarus R, Folkman S. *Stress, Appraisal, and Coping*. New York: Springer; 1984.

5. Carver CS. Resilience and thriving: issues, models, and linkages. *J Soc Issues*. 1998;54:245–266.

6. O'Leary VE, Ickovics JR. Resilience and thriving in response to challenge: an opportunity for a paradigm shift in women's health. *Womens Health Res Gender Behav Policy*. 1995;1:121–142.

7. Beasley M, Thompson T, Davidson J. Resilience in response to life stress: the effects of coping style and cognitive hardiness. *Pers Individ Dif*. 2003;34:77–95.

8. Misra R, McKean M. College students' academic stress and its relation to their anxiety, time management, and leisure satisfaction. *Am J Health Stud*. 2000;16:41–51.

9. Soderstrom M, Dolbier CL, Leiferman JA, Steinhardt MA. The relationship of hardiness, coping strategies, and perceived stress to symptoms of illness. *J Behav Med*. 2000;23:311–328.

10. Rawson HE, Bloomer K, Kendall A. Stress, anxiety, depression, and physical illness in college students. *J Genet Psychol*. 2001;155:321–330.

11. Yi JP, Smith RE, Vitaliano PP. Stress-resilience, illness, and coping: a person-focused investigation of young women athletes. *J Behav Med*. 2005;28:257–265.

12. O'Leary VE. Strength in the face of adversity: individual and social thriving. *J Soc Issues*. 1998;54:425–446.

13. Kobasa SC. Stressful life events, personality, and health: an inquiry into hardiness. *J Pers Soc Psychol*. 1979;37:1–11.

14. Mann M, Hosman CMH, Schaalma HP, de Vries N. Self-esteem in a broad-spectrum approach for mental health promotion. *Health Educ Res*. 2004;19:357–372.

15. Pengilly JW, Dowd ET. Hardiness and social support as moderators of stress. *J Clin Psychol*. 2000;56:813–820.

16. Chang EC. Dispositional optimism and primary and secondary appraisal of a stressor: controlling for confounding influences and relations to coping and psychological and physical adjustment. *J Pers Soc Psychol*. 1998;74:1109–1120.

17. Fredrickson BL, Levenson RW. Positive emotions speed recovery from the cardiovascular sequelae of negative emotions. *Cogn Emot*. 1998;12:191–220.

18. Fredrickson BL, Joiner T. Positive emotions trigger upward spirals toward emotional well-being. *Psychol Sci*. 2002;13:172–175.

19. Deckro GR, Ballinger KM, Hoyt M, et al. The evaluation of a mind/body intervention to reduce psychological distress and perceived stress in college students. *J Am Coll Health*. 2002;50:281–287.

20. Dziegielewski SF, Roest-Marti S, Turnage B. Addressing stress with social work students: a controlled evaluation. *J Soc Work Educ*. 2004;40:105–119.

21. Shapiro SL, Schwartz GE, Bonner G. Effects of mindfulness-based stress reduction on medical and premedical students. *J Behav Med*. 1998;21:581–599.

22. Rickinson B. Evaluating the effectiveness of counseling intervention with final year undergraduates. *Couns Psychol Q*. 1997;10:271–285.

23. Burns DD. *Feeling Good: The New Mood Therapy*. New York: HarperCollins; 1999.

24. Ellis A. *Overcoming Destructive Beliefs, Feelings, and Behaviors: New Directions for Rational Emotive Behavior Therapy*. New York: Prometheus Books; 2001.

25. Schwartz RC. *Internal Family Systems Therapy*. New York: Guilford Press; 1995.

26. Steinhardt MA. Transforming lives through resilience education. The University of Texas at Austin. http://www.utexas.edu/education/resilience/viewings. Accessed December 4, 2007.

27. Covey SR. *The 7 Habits of Highly Effective People*. New York: Simon & Schuster; 1989.

28. Branden N. *The Six Pillars of Self-Esteem*. New York: Bantam Books; 1994.

29. Ornish D. *Love and Survival: The Scientific Basis for the Healing Power of Intimacy*. New York: HarperCollins; 1997.

30. Schwartz RC. *Introduction to the Internal Family Systems Model*. Oak Park, IL: The Center for Self-Leadership; 2001.

31. Bartone PT, Ursano RJ, Wright KM, Ingraham LH. The impact of a military air disaster on the health of assistance workers: a prospective study. *J Nerv Ment Dis*. 1989;177:317–328.

32. Connor KM, Davidson JR. Development of a new resilience scale: the Connor–Davidson Resilience Scale (CD–RISC). *Depress Anxiety*. 2003;18:76–82.

33. Carver CS. You want to measure coping but your protocol's too long: consider the brief COPE. *Int J Behav Med*. 1997; 4:92–100.

34. Scheier MF, Carver CS, Bridges MW. Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): a re-evaluation of the Life Orientation Test. *J Pers Soc Psychol*. 1994;67:1063–1078.

35. Watson D, Clark LA, Tellegen A. Development and validation of brief measures of positive and negative affect: the PANAS scales. *J Pers Soc Psychol*. 1988;54:1063–1070.

36. Tugade MM, Fredrickson BL. Resilient individuals use positive emotions to bounce back from negative emotional experiences. *J Pers Soc Psychol*. 2004;2:320–333.

37. Rosenberg M. *Society and the Adolescent Self-Image*. Princeton, NJ: Princeton University Press; 1965.

38. Steinhardt M, Dolbier C, Mallon M, Adams T. The development and validation of a scale for measuring self-leadership. *J Self-Leadership*. 2003;1:20–31.

39. Radloff LS. The Center for Epidemiologic Studies Depression Index. *Appl Psychol Measurement*. 1977;1:385–401.

40. Cohen S, Williamson GM. Perceived stress in a probability sample of the United States. In: Spacapan S, Oskamp S, eds. *The Social Psychology of Health*. Newbury Park, CA: Sage; 1988:31–67.

41. Carver CS, Scheier MF, Weintraub JK. Assessing coping strategies: a theoretically based approach. *J Pers Soc Psychol*. 1989;56:267–283.

42. Folkman S, Moskowitz JT. Positive affect and the other side of coping. *Am Psychol*. 2000;55:647–654.

43. O'Donnell MP, ed. *Health Promotion in the Workplace*. Albany, NY: Delmar; 2002.

44. Cohen S, Kessler RC, Underwood GL. Strategies for measuring stress in studies of psychiatric and physical disorder. In: Cohen S, Kessler RC, Gordon LU, eds. *Measuring Stress: A Guide for Health and Social Scientists*. New York: Oxford Press; 1995:3–28.