Stress Management and Resilience Training Among Department of Medicine Faculty: A Pilot Randomized Clinical Trial

Amit Sood, MD., MSc.[1], *Kavita Prasad, MD.*[1], *Darrell Schroeder, MS.*[2], *and Prathibha Varkey, MBBS*[3]

[1]Complementary and Integrative Medicine Program, Division of General Internal Medicine, Mayo Clinic, Rochester, MN, USA; [2]Department of Biomedical Statistics and Informatics, Mayo Clinic, Rochester, MN, USA; [3]Division of Preventive, Occupational and Aerospace Medicine, Mayo Clinic, Rochester, MN, USA.

BACKGROUND: Physician distress is common and related to numerous factors involving physicians' personal and professional lives. The present study was designed to assess the effect of a Stress Management and Resiliency Training (SMART) program for increasing resiliency and quality of life, and decreasing stress and anxiety among Department of Medicine (DOM) physicians at a tertiary care medical center.

PARTICIPANTS: Forty DOM physicians were randomized in a wait-list controlled clinical trial to either the SMART intervention or a wait-list control group for 8 weeks. The intervention involved a single 90 min one-on-one training in the SMART program. Primary outcome measures assessed at baseline and week 8 included the Connor Davidson Resilience Scale (CDRS), Perceived Stress Scale (PSS), Smith Anxiety Scale (SAS) and Linear Analog Self Assessment Scale (LASA).

RESULTS: Thirty-two physicians completed the study. A statistically significant improvement in resiliency, perceived stress, anxiety, and overall quality of life at 8 weeks was observed in the study arm compared to the wait-list control arm: CDRS: mean±SD change from baseline +9.8±9.6 vs. -0.8±8.2, t(30)=3.18, p=0.003; PSS: -5.4±8.1 vs. +2.2±6.1, t(30)=-2.76, p=0.010; SAS: -11.8±12.3 vs.+ 2.9±8.9, t(30)=-3.62, p=0.001; and LASA: +0.4±1.4 vs. -0.6±1.0, t(30)=2.29, p=0.029.

CONCLUSIONS: A brief training to enhance resilience and decrease stress among physicians using the SMART program was feasible. Further, the intervention provided statistically significant improvement in resilience, stress, anxiety, and overall quality of life. In the future, larger clinical trials with longer follow-up and possibly wider dissemination of this intervention are warranted.

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INTRODUCTION

Physicians are considered healers of the society. However, an expanding body of literature documents growing personal distress among physicians.[1–3] Physician distress is related to numerous factors, including a loss of control, workload, specialty choice, experience with suffering, college loans, poor self-care, maladaptive coping strategies and stressful life events.[4–7] Academic physicians are especially at high risk for experiencing stress because of multiple demands and expectations.[8]

Negative effects of physician distress include decreasing level of satisfaction, attrition from academic practice, loss of empathy, decrease in idealism, poor mental health, and burnout.[7,9] Burnout may affect an estimated 25–60% of physicians.[7–10] Decreased physician well-being also increases risk of medical errors.[7]

Despite a rich literature on physician distress, very limited data are available on effective initiatives to decrease burnout.[11] One possible promising approach is to enhance individual resilience. Resilience refers to the ability of an individual to withstand adversity.[12] Resilience positively correlates with lower psychological distress and higher well-being.[13,14] Prospective studies suggest that resilience training may improve measures of psychological distress, self-efficacy, and self-esteem in workplace settings,[15,16] with college students,[17] and in patients with diabetes.[18] Most of the resilience training programs, however, entail several weeks of training with a considerable time commitment.

Keeping these limitations in mind, we have developed a Stress Management and Resiliency Training (SMART) program that involves <2 h of training accomplished in one or two visits. The present study was designed to test the SMART program to enhance physician resilience and decrease stress among Department of Medicine (DOM) faculty.

METHODS

Study Design and Population

The Mayo Foundation Institutional Review Board (IRB) reviewed and approved the study protocol. The study was designed as a randomized, wait-list controlled, pilot clinical trial enrolling 40 Mayo Clinic Rochester physicians. Inclusion criteria were: (1) being a faculty member of the DOM and (2) being able and willing to participate. Exclusion criteria were: (1) recent (within the past 6 months) psychotic episode or (2) clinically significant acute unstable neurological, psychiatric, hepatic, renal, cardiovascular, or respiratory disease that prevented participation in the study.

Study Administration

After obtaining the informed consent, physicians were randomly assigned to one of two groups—an active arm or a wait-list control arm. Intervention for the wait-list control arm was delayed by 8 weeks. Prior to receiving the intervention, participants completed the following validated instruments: Connor-Davidson Resilience Scale (CD-RISC),[12,19] Perceived Stress Scale (PSS),[20] Smith Anxiety Scale (SAS),[21] Linear Analog Self Assessment Scale (LASA),[22] and Visual Analog Scale-Fatigue (VAS-Fatigue).[23]

Study Intervention

The study intervention was a single 90-min session training in the SMART program. The SMART program has been adapted from Attention and Interpretation Therapy (AIT). AIT is a structured therapy developed at the Mayo Clinic to decrease stress and enhance resilience. AIT addresses two aspects of human experience, attention and interpretation. Research suggests that human attention instinctively and inordinately focuses on threats and imperfections.[24,25] Since a considerable amount of threat exists within the domains of past and future, attention gets engaged in the psychological frame of time. This predisposes to excessive thinking, ineffective efforts toward thought suppression, and avoidant response.[26–28] AIT guides learners to delay judgment and pay greater attention to the novelty of the world. Complementing attention training is instruction to help participants direct their interpretations away from fixed prejudices toward a more flexible disposition while cultivating skills such as gratitude, compassion, acceptance, forgiveness, and higher meaning.

Participants were also provided training in a brief structured relaxation intervention (paced breathing meditation). In this program, participants were taught to practice deep diaphragmatic breathing at five breaths per minute for 5 or 15 min, once or twice a day. Participants were also offered an optional 30–60 min follow-up session depending on individual needs.

Statistical Analyses

For each measurement scale, the change from baseline was compared between groups using the two-sample t-test. To supplement these analyses, the within-group change (baseline vs week 8) was assessed for each study arm using the paired t-test. The p-values presented are not corrected for multiple comparisons. In all cases, two-tailed $p<0.05$ was considered statistically significant. A sample size of 40 was selected for this pilot study after weighing statistical considerations along with logistical and resource constraints. In general, for a continuous outcome variable, a sample size of 40 provides statistical power (two-tailed, alpha=0.05) of >85% to detect a difference of 1 standard deviation between groups.

RESULTS

Demographics

Of the 40 enrolled (all academic clinicians), 32 (80%) physicians completed the study. Eight participants (all in the control arm) declined to participate after randomization and prior to filling out any assessments because of scheduling issues (Fig. 1). Mean age of the participants in the active arm (46.8±8.3 years) was comparable to the control arm (50.2±5.7 years). Gender distribution was comparable across the two arms (55% vs 50% males in the active and control arm, respectively). All 20 participants in the active arm completed the 90-min training. Four participants in the active arm participated in an additional 30-min session.

Outcome Measures

A summary of the outcome measures is presented in Table 1. For the active arm, a significant increase was observed in the Connor Davis Resilience Scale [paired t-test, $t(19)=4.54$, $p<0.001$], and significant decreases were observed in the Perceived Stress Scale [paired t-test, $t(19)=-2.95$, $p=0.008$] and Smith Anxiety Scale [paired t-test, $t(19)=-4.31$, $p<0.001$]. When the change from baseline was compared between study arms, a statistically significant improvement was found for resiliency, perceived stress, anxiety, and overall quality of life in the study arm compared to the wait-list control arm [CDRS: mean±SD change from baseline +9.8±9.6 vs. -0.8±8.2, $t(30)=3.18$, $p=0.003$; PSS: -5.4±8.1 vs. +2.2±6.1, $t(30)=-2.76$, $p=0.010$); SAS: -11.8±12.3 vs. +2.9±8.9, $t(30)=-3.62$, $p=0.001$; and LASA +0.4±1.4 vs. -0.6±1.0, $t(30)=2.29$, $p=0.029$]. No side effects were reported.

DISCUSSION

This pilot study demonstrates that a brief intervention of resilience training among physicians using the SMART program is feasible. The study also suggests that the intervention has a potential to improve resiliency, stress, anxiety, and quality of life among physicians.

The high prevalence[1–3] and negative impact[4–7] of physician distress with resulting burnout is well described in the literature. Presently, however, few training programs exist with well-documented efficacy to enhance physician well-being and decrease burnout. In a recent study, an intensive educational program in mindfulness, communication, and self-awareness delivered over 52 h to 70 primary care academic physicians

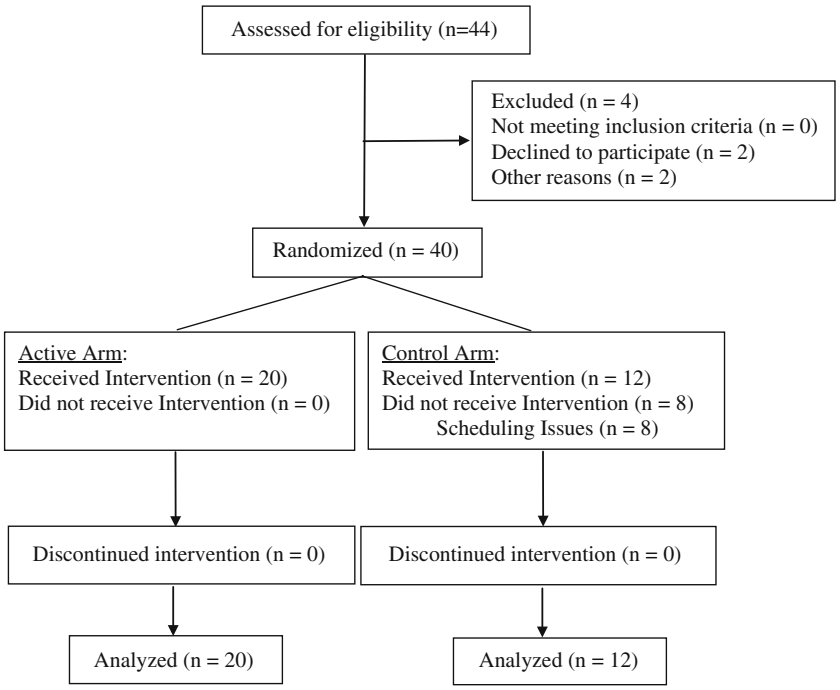

Figure 1. Flow diagram of the progress in a randomized clinical trial to assess the effect of resiliency training among physicians.

improved measures of mindfulness, burnout, personal accomplishment, empathy, and mood disturbances.[29] The study, however, was not a randomized trial and may have enrolled a select group of highly motivated individuals.

We believe this is the first randomized pilot trial that has tested the impact of physician resilience training. The brief duration of the intervention is a particularly compelling aspect of the study. Most programs currently available and tested entail several weeks of training with considerable time commitment.[15,18,30,31]

The effect size of the intervention was large (approximately one standard deviation) and comparable to other resiliency training interventions.[15,18,30,31] In the original validation study, psychiatric outpatients scored 68 on the CD-RISC, while the US general population scored 80.7.[12] The baseline score of 68 and 69.6 in the two groups in this study was similar to that of the psychiatric outpatients, while the end-of-study score in the active group of 79.4 was similar to that of the US general population. Similarly, in the initial validation studies, the mean PSS score in the general population was 19.62±7.49. The baseline score of 28.2 and 26.2 in the current study correlates with a high level of stress, and an effect size of one standard deviation decrease of stress would be a large effect size.[20] The promising efficacy data have prompted us to pursue this intervention among physician groups in other departments and also to offer the intervention as a staff satisfaction initiative to physicians.

There are, however, several limitations in this study that need to be addressed before widespread dissemination of the intervention. These limitations include a small sample size, open-label intervention, differential attrition across the two treatment arms, and likely enrollment of participants highly motivated to learn and practice the skills shared. Furthermore, we used a wait-list group as the control intervention and thus cannot exclude the possibility that the efficacy was driven by the attention received by the active arm. The short duration of

Table 1. Primary Outcome Measures from a Randomized Clinical Trial to Assess the Effect of Resiliency Training Among Physicians*

	Active (N=20)		Wait list (N=12)		Treatment effect		
	Baseline	Week 8	Baseline	Week 8	Estimate (95% CI)	Cohen's d	p
Connor Davis Resilience Scale	69.6±13.3	79.4±11.3†	68.0±11.2	67.2±11.6	+10.6 (+3.8, + 17.4)	+1.16	0.003
Perceived stress	28.2±5.9	22.8±5.5†	26.2±6.9	28.3±6.3	-7.5 (-13.1, -2.0)	-1.01	0.010
Smith Anxiety Scale	55.2±13.6	43.4±14.1†	50.5±23.0	53.4±23.1	-14.8 (-23.1, -6.4)	-1.32	0.001
Overall quality of life	7.6±1.2	8.0±1.3	7.8±1.1	7.2±1.2	+1.0 (+0.1, +2.0)	+0.83	0.029
Fatigue	4.5±2.6	4.3±2.5	4.9±2.7	5.4±2.4	-0.7 (-2.6, + 1.2)	-0.23	0.462

**Raw scores at baseline and week 8 are summarized using mean±SD. Changes from baseline to week 8 were assessed for each treatment group using the paired t-test, and the mean change from baseline was compared between treatment groups using the two-sample t-test. Treatment effects are summarized by reporting the estimated difference between groups and corresponding 95% confidence interval, Cohen's d, and the p-value from the two-sample t-test*

†p<0.05 for paired t-test comparing baseline versus week 8 within the given group

the intervention, however, makes this less likely. Our follow-up was also for a short duration, limiting our ability to assess the long-term effect of the intervention. Differential attrition across the treatment arm is a significant limitation. It could be that among the control group only those who were most in need of the intervention remained through the 8-week follow-up. This would artificially increase the magnitude of the difference between the two study arms. However, the participants who chose not to participate were similar in demographics to the participants who completed the study, were all academic clinicians, and the baseline stress and resilience measures of the randomized groups were comparable, making it less likely that differential attrition would account for the effect of the intervention. The results from this study thus provide only preliminary evidence of efficacy and, as a next step, need to be confirmed in larger clinical trials with a longer duration of follow-up and more active intervention for the control arm.

In summary, a brief intervention in stress management and resilience training (SMART) for physicians is feasible and offers a potential to improve short-term scores in self-reported measures of resilience, quality of life, stress, and anxiety. Such an approach warrants further investigation.

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Corresponding Author: *Amit Sood, MD., MSc.; Complementary and Integrative Medicine Program, Division of General Internal Medicine, Mayo Clinic, 200 First Street SW, Rochester, MN 55905, USA (e-mail: sood.amit@mayo.edu).*

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