Stress Management and Resiliency Training (SMART) Program among Department of Radiology Faculty: A Pilot Randomized Clinical Trial

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Objective: To test the efficacy of a Stress Management and Resiliency Training (SMART) program for decreasing stress and anxiety and improving resilience and quality of life among Department of Radiology physicians.

Materials and Methods: The study was approved by the institutional review board. A total of 26 Department of Radiology physicians were randomized in a single-blind trial to either the SMART program or a wait-list control arm for 12 weeks. The program involved a single 90-min group session in the SMART training with two follow-up phone calls. Primary outcomes measured at baseline and week 12 included the Perceived Stress Scale, Linear Analog Self-Assessment Scale, Mindful Attention Awareness Scale, and Connor–Davidson Resilience Scale.

Results: A total of 22 physicians completed the study. A statistically significant improvement in perceived stress, anxiety, quality of life, and mindfulness at 12 weeks was observed in the study arm compared to the wait-list control arm; resilience also improved in the active arm, but the changes were not statistically significant when compared to the control arm.

Conclusions: A single session to decrease stress among radiologists using the SMART program is feasible. Furthermore, the intervention afforded statistically significant and clinically meaningful improvement in anxiety, stress, quality of life, and mindful attention. Further studies including larger sample size and longer follow-up are warranted.

Key words: Radiology, physician, stress, resiliency, burnout

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INTRODUCTION

As physician workloads have increased in recent years, so has physician distress. It is prominent among radiologists who cite volume of work, practice setting, frequent interruptions, and the worry of diagnostic errors[1] as contributing to their distress.[2] Other factors that increase physician distress include difficulties managing relationships and finances, poor self-care, general life stressors, and poor coping abilities.[3–5] The distress among radiologists negatively impacts their professionalism, empathy, and increases diagnostic errors.[2,6–10] Physician distress also contributes to high burnout rates and increases job dissatisfaction.[6,11–15]

A few pilot studies have investigated interventions to reduce physician distress.[8,9,16–19] Several of these interventions are intense and entail long training times and commitment for daily practice. Given physicians' time constraints, we developed an abbreviated program that can be learned in one or two brief sessions and does not entail elaborate sitting practice. In a previous randomized clinical trial, we tested the efficacy of this program [called the Stress Management and Resiliency Training (SMART) program] among Department of Medicine faculty.[20] This study demonstrated a significant decrease in perceived stress and anxiety and an improvement in resilience and quality of life in the active arm, compared to the control arm. The present study was designed to test the efficacy of a similar program to decrease stress and anxiety and enhance resilience and quality of life among Department of Radiology faculty, practicing at a tertiary care center. To our knowledge, no previous study has tested the efficacy of stress management intervention among radiologists.

MATERIALS AND METHODS

The study methods overlap with those described in our previously published studies.[10,20]

Study Design and Population

The Institutional Review Board (IRB) reviewed and approved the study protocol prior to recruitment and enrollment. The trial was designed as a randomized, wait-list controlled, pilot

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clinical trial enrolling 26 faculty members of the Department of Radiology at our institution.

Eligibility was based on the following criteria: (1) staff members (physicians or scientists) within the Department of Radiology, (2) able and willing to participate in all aspects of the study, and (3) able to understand and sign the informed consent. Subjects were excluded if they had (1) experienced a psychotic episode within the previous six months or (2) clinically significant acute unstable neurological, psychiatric, hepatic, renal, cardiovascular, or respiratory disease that would prevent participation in the study.

A sample size of 40 was calculated after weighing statistical and logistical considerations. To detect a difference between groups with a two-sided 5% significance level and power of 85% using continuous outcomes, a sample size of 20 subjects per group was necessary.

Study Administration

Recruited participants were referred to the study coordinator who assessed if subjects met study criteria. After obtaining informed consent, participants were assigned to one of two groups: an active arm or a wait-list control arm using a simple randomization schedule generated by the Department of Biomedical Statistics and Informatics. The allocation sequence was available only to the study coordinator and concealed from the researchers involved in recruitment. Subjects were de-identified and assigned a coded study identification number. This code was maintained by the statistician and unavailable to study investigators ensuring blinding of the investigators to the outcome measures. Enrollment for the study ran from April 2010 to May 2011. The intervention for the wait-list control arm was delayed by 12 weeks as compared to the active arm.

Prior to attending the small group session, participants completed the informed consent and the following instruments: Perceived Stress Scale (PSS), Smith Anxiety Scale (SAS), Linear Analog Self-Assessment Scale (LASA), Mindful Attention Awareness Scale (MAAS), and Connor–Davidson Resilience Scale (CD-RISC).

PSS is a 14-item self-report tool that provides a global measure of perceived stress.[21,22] Responses range on a 5-point scale from "never" to "very often." A higher score indicates greater stress. The PSS correlates well with life-events stress measures and social anxiety and has adequate reliability. SAS is a 22-item self-report tool that differentiates between cognitive and somatic anxiety symptoms, which are similar to most stress symptoms.[23–25] The 12-item, validated LASA tool evaluates overall quality of life and overall mental, physical, emotional, social, and spiritual well-being. Responses range from 0 "as bad as it can be" to 10 "as good as it can be."[26,27] CD-RISC is a 25-item scale with each item rated on a 0–4 scale, with higher scores reflecting more resilience.[28] CD-RISC has been evaluated for reliability, validity, and factor structure and has been shown to have good psychometric properties with the ability to distinguish between participants with lesser and greater resilience.[29] The MAAS is a 15-item measure assessing mindfulness of moment-to-moment experience.[30] This 15-item scale measures the frequency of mindful states in day-to-day life, using both general and situation-specific statements. The outcome tools were completed by both the groups at baseline and week 12.

Study Intervention

The study intervention was a single, 90-min small-group session in the SMART program. The SMART program is an abbreviated adaptation of Attention and Interpretation Therapy (AIT).[10,20] As we have previously described, AIT was developed as a scientific and structured program at Mayo Clinic Rochester to decrease personal stress and enhance resiliency.[10] AIT and SMART focus on two aspects of human experience: attention and interpretation. Human attention prioritizes focus on threats.[31] These threats, in modern times, are often symbolic psychological threats (hurts, regrets, worries, and fears) that draw attention away from the present moment. This predisposes to ruminative thinking, avoidance, and ineffective thought suppression, all contributing to stress.[32,33] The SMART program teaches learners to focus their attention in the external world and to defer unrefined judgments. Learners also are taught to cultivate and guide their interpretations by five higher-order principles: gratitude, compassion, acceptance, meaning, and forgiveness. The session is taught in groups with the help of a PowerPoint slide presentation.

In addition to the above, participants were also trained in a brief structured relaxation intervention (paced breathing meditation) where participants were guided to practice deep diaphragmatic breathing at five breaths per minute for 5 or 15 min, once or twice a day. At the conclusion of the in-person visit, participants were provided reading materials that covered the skills discussed and were offered an optional 30–60-min follow-up session and two follow-up phone calls at weeks 4 and 8. Those in the wait-list control arm received the SMART intervention after completion of their participation in the study.

Statistical Analyses

Study endpoints included changes in stress (PSS), anxiety (SAS), resilience (CD-RISC), overall quality of life (LASA), and mindfulness score (MAAS). These assessments were evaluated at baseline and week 12 for each group. Data were summarized as both raw scores and also as change from baseline. For each treatment group, the post-randomization measurements were compared to baseline using the one-sample t test, and the change from baseline was compared between groups using the two-sample t test. For the four subjects (two SMART and two Control) who did not complete the week 12 assessments, the baseline values were carried forward to week 12 to provide the most conservative estimate of efficacy.

RESULTS

Demographics

A total of 26 radiologists were randomized in the study (13 SMART and 13 Control) (Table 1). Two subjects from each arm completed the baseline questionnaires but did not complete the 12-week questionnaires (Figure 1). All participants in the active arm completed the initial 90-min group training. Eight participants in the active arm