

Summary of Research Studies

Our team has conducted two groups of studies: Clinical trials and Observational studies.

Clinical Trials (Completed)

1. Sood A, Prasad, K, Schroeder D, Varkey P. Stress management and resilience training among Department of Medicine faculty: a pilot randomized clinical trial. J Gen Intern Med. 2011 Aug;26(8):858-61.

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In this randomized clinical trial, a brief training to enhance resilience and decrease stress among physicians led to a statistically significant improvement in resilience, stress, anxiety, and overall quality of life.

2. Loprinzi CE, Prasad K, Schroeder DR, Sood A. Stress Management and Resilience Training (SMART) program to decrease stress and enhance resilience among breast cancer survivors: a pilot randomized clinical trial. Clin Breast Cancer. 2011 Dec;11(6):364-8.

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A brief, predominantly group-based resilience training intervention in patients with breast cancer led to a statistically significant lowering of stress and anxiety and improvement in quality of life and resilience, in a randomized clinical trial.

3. Sood A, Sharma V, Schroeder DR, Gorman B. Stress Management and Resiliency Training (SMART) program among Department of Radiology faculty: a pilot randomized clinical trial. Explore (NY). 2014 Nov-Dec;10(6):358-63.

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A single 90-minute session followed by two brief phone calls to decrease stress among radiologists using the SMART program, significantly improved anxiety, stress, quality of life, and mindful attention. Resilience also improved but the change was not statistically significant.

4. Chesak SS, Bhagra A, Schroeder DR, Foy DA, Cutshall SM, Sood A. Enhancing resilience among new nurses: feasibility and efficacy of a pilot intervention. Ochsner J. 2015 Spring;15(1):38-44.

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Integrating a Stress Management and Resiliency Training (SMART) program within an employee orientation for nurses helped increase mindfulness and resilience scores and decrease stress and anxiety.

5. Stonnington CM, Darby B, Santucci A, Mulligan P, Pathuis P, Cuc A, Hentz JG, Zhang N, Mulligan D, Sood A. A resilience intervention involving mindfulness training for transplant patients and their caregivers. Clin Transplant. 2016 Nov;30(11):1466-1472.

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A six-week mindfulness-based resilience training (MBRT) class that incorporated mindfulness practice, yoga, and neuroscience of stress and resilience significantly improved perceived stress, depression, anxiety, positive and negative affect, and mental quality of life among transplant patients and their caregivers.

6. Sharma V, Sood A, Prasad K, Loehrer L, Schroeder D, Brent B. Bibliotherapy to decrease stress and anxiety and increase resilience and mindfulness: a pilot trial. Explore (NY). 2014 Jul-Aug;10(4):248-52.

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A brief, self-directed resilience program provided statistically significant improvement in resilience, mindfulness and quality of life, and lower stress and anxiety at 12-weeks.

7. Magtibay DL, Chesak SS, Coughlin K, Sood A. Decreasing Stress and Burnout in Nurses: Efficacy of Blended Learning with Stress Management and Resilience Training Program. J Nurs Adm. 2017 Jul/Aug;47(7-8):391-395.

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A combined web-based and in-person Stress Management and Resiliency Training (SMART) program led to statistically significant decrease in anxiety, stress, and burnout and increase in resilience, happiness, and mindfulness among a group of nurses.

8. Werneburg B, A; Sarah M. Jenkins, MS; Jamie L. Friend, BS; Bridget E. Berkland, MA; Matthew M. Clark, PhD; Jordan K. Rosedahl, BS; Heather R. Preston, MS; Denise C. Daniels, BS; Beth A. Riley, MBA; Kerry D. Olsen, MD; Amit Sood, MD. Improving Resiliency in Health Care Employees. American Journal of Health Behavior.

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A 12-week training in stress management and resilience led to statistically significant improvement in resiliency, perceived stress, anxiety level, quality of life, and health behaviors at the end of the intervention and at further three-months follow up.

9. Bridget E. Berkland, MA, Brooke L. Werneburg, BA, Sarah M. Jenkins, MS, Jamie L. Friend, BS, Matthew M. Clark, PhD, Jordan K. Rosedahl, BS, Paul J. Limburg, MD, Beth A. Riley, MBA, Denise R. Lecy, BS, Amit Sood, MD. Improving Happiness, Life Satisfaction and Gratitude in Health Care Workers: A Worksite Wellness Intervention. Mayo Clinic Proceedings.

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In health care workers, training in a resilience program (SMART) was associated with statistically significant improvements in happiness, satisfaction with life, gratitude, resilience, mindfulness, and spirituality.

10. Prasad K, Wahner-Roedler DL, Cha SS, Sood A. Effect of a single-session meditation training to reduce stress and improve quality of life among health care professionals: a “dose-ranging” feasibility study. *Altern Ther Health Med*. 2011 May-Jun;17(3):46-9

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A paced breathing intervention for 15 minutes once or twice a day after a single training session improved stress, anxiety and quality of life among health care employees.

11. Kashani K, Carrera P, De Moraes AG, Sood A, Onigkeit JA, Ramar K. Stress and burnout among critical care fellows: preliminary evaluation of an educational intervention. *Med Educ Online*. 2015 Jul 23;20:27840.

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Two out of three (67%) critical care fellows who participated in a single, 90-minute stress management session adapted from the Stress Management and Resiliency Training (SMART) program reported strengthened ability to deal with stressful situations. No significant improvement in self-reported burnout was found.

12. Chesak, Sherry PhD, RN; Morin, Karen, PhD, RN, ANEF, FAAN ; Cutshall, Susanne DNP, APRN, CNS; Sarah Jenkins, MS; Sood, Amit MD, MSc. Feasibility of Integrating a Resiliency Training in a Nurse Residency Program: A Controlled Trial with Long-Term Follow-up. (Poster presented; PhD thesis defended; Manuscript in preparation)

Integration of a Stress Management and Resiliency Training (SMART) program within a pilot nurse residency program led to statistically significant improvement in stress, mindfulness, and resilience within the intervention group, compared to a control group of nurses that received no such training.

13. Laura D. Steinkraus, Barbara L. Joyce, PhD, Amit Sood, MD MSc Integration of Stress Management and Resilience Training (SMART) Program Among Medical Students: A Pilot Study. (Poster presented; Manuscript in preparation)

In this single-arm study, SMART program taught by a medical student to other students led to statistically significant improvement in mindfulness and anxiety up to one year of follow up.

14. Zaraq Khan MBBS; Debbie L. Fuehrer LPCC; Richa Sood MD, Charles C. Coddington MD; Gaurang S. Daftary MD, Jessica L. Bleess PA-C; Elizabeth A. Stewart MD; Jani R. Jensen MD; and Amit Sood MD. Stress Management and Resilience Training (SMART) therapy for couples undergoing in vitro fertilization (IVF): A Randomized Controlled Trial (RCT) (Poster presented; Manuscript in preparation)

Among couples undergoing IVF, training in brief SMART program, compared to a control group, led to significant improvement in generalized and fertility related anxiety. Both men and women responded to the intervention.

15. Sherry S. Chesak, PhD, RN, Anjali Bhagra, MD, Sarah M. Jenkins, MS, Amit Sood, MD. Stress Management and Resilience Training for Public School Teachers and Staff: A Novel Intervention to Enhance Resilience and Positively Impact Student Interactions. (Manuscript submitted)

In a clinical trial involving public school teachers and staff, SMART training led to statistically significant improvement in participant anxiety ($P<.001$); gratitude ($P=.005$); and quality of life ($P<.001$). Most participants reported that the skills learned positively affected interactions with students (77.2%) and coworkers (72.2%).

16. Jose R Medina Inojosa MD, Mariana Garcia MD, Sharon L. Mulvagh MD, Saswati Mahapatra MS, Francisco Jimenez-Lopez MD, Brent A Bauer MD, Stephen S Cha, Amit Sood MD, Anjali Bhagra MD. Stress Management and Resilience Intervention in Women's Heart Clinic: a Pilot Clinical Trial. (Poster presented; Manuscript submitted)

In this clinical trial among patients at women's heart clinic, both in person and online training in SMART program led to statistically significant improvement in perceived stress and anxiety and significant improvement in depressive symptoms among patients with higher depressive symptoms.

17. Dyrbye LN, Shanafelt TD, Werner L, Sood A, Satele D, Wolanskyj AP. The Impact of a Required Longitudinal Stress Management and Resilience Training Course for First-Year Medical Students. J Gen Intern Med. 2017 Aug 31

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Integration of a required mindfulness-based stress management course in the curriculum of first-year medical students did not lead to significant improvements in medical student well-being or empathy.

18. Gnagey, A, Cutshall S, Sood A. Impact of a Pilot Wellness Curriculum on Healthy Behaviors, Resilience, Stress, Burnout, and Anxiety among Student Registered Nurse Anesthetists. (Poster presented, Masters thesis defended, Manuscript in preparation)

Integration of stress management and resilience training among nurse anesthetists was associated with significant improvement in stress and burnout symptoms in the cohort that participated in the training.

19. Dhanorker S, Kamath J, Shanafelt T, Sood, A. Reducing Burnout by Enhancing Resiliency. Journal of Health Care Management.

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In this worksite intervention among engineering and consulting professionals training in stress management and resilience skills was associated with a statistically significant decrease in burnout with qualitative feedback supportive of the efficacy of the program.

20. Sharma V, Saito Y, Sood A. SMART program for patients with IBS. (Masters in Clinical Research thesis defended with this study)

In this randomized clinical trial, training in SMART program was associated with significant improvement in anxiety, satisfaction with life and gratitude, while no significant changes were observed in the control arm that received stress management DVD.

21. West, R.R., Lauver, D. R., & Sood, A. Mindfulness skills training for stress management among low socioeconomic workers. (PhD thesis defended with this study; Several posters presented)
In this randomized trial involving low income migrant workers, compared to a control group that received nutrition education, training in stress management and resilience skills was associated with improvement in stress and mindfulness, with qualitative data supporting the quantitative outcome.

22. Gullickson A, Graham MA, Amundson KA, Smyth KT, Sood A. A mindfulness and neuroscience-based intervention: Stress management and resilience in the workplace. (Masters thesis defended with this study)

In this qualitative study, participation in stress management and resilience training program was associated with participants' orientation to time, self-care, relationships with clients and coworkers, and improved coping skills within the work environment.

23. Fuehrer D, Schroeder D, Sood A. SMART Program: Outcomes of Train-the-Trainer program.
Participants in the SMART train-the-trainer program experienced statistically significant improvement in resilience, stress, anxiety and quality of life.

Clinical Trials (Ongoing)

24. Sex SMART – This study is assessing the efficacy of resilience training among couples with intimacy issues.
25. Patients with melanoma – This study is assessing the efficacy of resilience training for stress and wellbeing measures and immune markers among patients with melanoma.

26. Effect on Brain Networks – This study is assessing the effect of resiliency training on the organization of brain networks in health adults.
27. Depression – This study is assessing the efficacy of resiliency training among people with moderate depression.
28. Employee populations – Several studies are assessing the efficacy of resiliency training among different employee populations for wellbeing measures, productivity, and resilience.

Observational Studies

1. Clark MM, Jenkins SM, Hagen PT, Riley BA, Eriksen CA, Heath AL, Vickers Douglas KS, Werneburg BL, Lopez-Jimenez F, Sood A, Benzo RP, Olsen KD. High Stress and Negative Health Behaviors: A Five-Year Wellness Center Member Cohort Study. J Occup Environ Med. 2016 Sep;58(9):868-73.

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In this study, high stress levels were associated with negative health behaviors, such as low physical activity and poor nutritional habits, as well as lower mental health and perceived overall health among a group of employees of an academic medical center.

2. Leppin AL, Bora PR, Tilburt JC, Gionfriddo MR, Zeballos-Palacios C, Dulohery MM, Sood A, Erwin PJ, Brito JP, Boehmer KR, Montori VM. The efficacy of resiliency training programs: a systematic review and meta-analysis of randomized trials. PLoS One. 2014 Oct 27;9(10):e111420.

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This study reviewed and compiled the currently known resiliency programs in a systematic review.

3. Sood A, Jones DT. On mind wandering, attention, brain networks, and meditation. Explore (NY). 2013 May-Jun;9(3):136-41.

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This highly cited review article provides a mechanistic understanding of meditation in the context of recent advances in neurosciences about mind wandering, attention, and the brain networks.

4. Kermott C, Jenkins S, Sood A. A survey of corporate executives and their spouses.

In this large study involving over 2000 participants, our team has found that resilience correlates with better physical health, emotional wellbeing, deeper relationships and greater success at work. (Several manuscripts in preparation)

Published Books

1. *The Mayo Clinic Guide to Stress-Free Living*. Sood, A
2. *The Mayo Clinic Handbook for Happiness*. Sood, A
3. *Immerse: A 52-week Course in Resilient Living*. Sood, A
4. *Mindfulness Redesigned for the Twenty-First Century*. Sood, A

Completed Masters and PhD Thesis

1. Gullickson A.M. Attention and Interpretation Training in a Community-Based Mental Health Agency. Masters in Social Work Clinical Research Committee, Saint Catherine University/University of Saint Thomas School of Social Work, 2011.
2. West R. R. Brief mindfulness skills training intervention among low SES workers. PhD Thesis, University of Illinois at Chicago, 2011.
3. Voigt B. The Impact of Attention and Interpretation Therapy (AIT) on the Practitioner: Beneficial for Helping Professionals? Master's thesis, St. Catherine University 2013.
4. Chesak S. Attention and Interpretation Therapy Among Newly Hired Nurses. PhD Thesis, University of Wisconsin-Milwaukee.
5. Sharma V., M.D. SMART Program for Irritable Bowel Syndrome. Masters in Clinical Research, Mayo Clinic Rochester.
6. Gnagey, A. Impact of a Pilot Wellness Curriculum on Healthy Behaviors, Resilience, Stress, Burnout, and Anxiety among Student Registered Nurse Anesthetists. Doctoral thesis, Mayo Clinic Rochester.

Abstracts / Posters (List last updated: 2014)

1. Gullickson A. M., Graham M. A., Amundson K.A., Smyth K. T., Sood A. A Mindfulness and Neuroscience Based Intervention: Stress Management and Resilience in the Workplace. Poster session at the meeting of the International Symposia of Contemplative Studies, Denver, Colorado, April 2012.
2. West R., Lauver D., Sood A. Mindfulness skills training for stress management among low socioeconomic workers. Midwest Nursing Research Society 36th Annual Research Conference, Dearborn, Michigan, April, 2012.
3. Sood A. Stress Management and Resilience Training (SMART) Program to Decrease Stress and Enhance Resilience Among Breast Cancer Survivors: A Randomized Trial. 2012 International Research Congress on Integrative Medicine and Health, Portland, Oregon, May 15–18, 2012.
4. Sood A. Stress Management and Resilience Training among Department of Medicine Faculty: A Pilot Randomized Clinical Trial. 2012 International Research Congress on Integrative Medicine and Health, Portland, Oregon, May 15–18, 2012.
5. Sharma V, Sood A. Self Help Intervention to Decrease Stress and Increase Mindfulness: A Pilot Trial. 2012 International Research Congress on Integrative Medicine and Health, Portland, Oregon, May 15–18, 2012.
6. West, R. R., Lauver, D.R., & Sood A. Enhancing study recruitment and retention among community-based low socioeconomic workers. 19th National Evidence-based Practice Conference, Iowa, City, IA, May 3–4, 2012.
7. Chesak S., Foy D., Cutshall S., Sood A. A Stress Management and Resiliency Training (SMART) Program for Newly Hired Nurses. 2012 AHNA Annual Conference. Snowbird, UT, June 2012.
8. West, R, Lauver, D, Sood A. Strategies to improve recruitment and retention among a sample of low socioeconomic workers. Midwest Nursing Research Society 36th Annual Research Conference, Dearborn, Michigan, April 12–15, 2012.

9. Chesak, S, Sood, A, Morin, K, Cutshall, S, Douglas, KV, Ridgeway, J. Integration of A Stress Management and Resiliency Training (SMART) Program in a Nurse ResidencyProgram: A Feasibility Study. The Journal of Alternative and Complementary Medicine. May 2014, 20(5): A101-A101. doi:10.1089/acm.2014.5267. Published in Volume: 20 Issue 5: May 7, 2014 <http://online.liebertpub.com/doi/pdfplus/10.1089/acm.2014.5267.abstract>