Kimberly Dale, Erin Toomey, Angela Lauten Study Buddies\_ Assignment #4

**“StressLess TarHeals”**

*A Health and Wellness Initiative for UNC-Chapel Hill Medical Professional Students*

**Statement of Need:**

Coping with stress appears to be one of the greatest challenges currently facing the medical profession.1 It has been well documented that graduate health professional students experience stress and anxiety throughout their education and training. As a result of the demanding academic expectations of medical curriculum, unstructured time, lack of sleep, and a stress-conducive environment, these students appear to be particularly vulnerable to experiencing extreme stress. Some stress, known as eustress, is helpful and aids students in a drive toward achievement and success. Negative stress however, known as distress, affects life in an adverse manner and is a common cause of ill health in these students.5

The inability to cope successfully with the enormous demands of medical school and medical practice may lead to a cascade of consequences at both a personal and professional level.2 Documented consequences of stress in medical students’ lives include alcohol and drug abuse3, interpersonal relationship difficulties4, depression and anxiety5, and suicide.6 Furthermore, stress may harm the professional effectiveness of medical students in the clinic setting: it decreases attention, reduces concentration, impinges on decision-making skills, and reduces their ability to establish strong physician relationships.7 Distress combined with perceived lack of time often leads to decreased physical activity, change in appetite8, as well as increased intake of processed, high-fat and sugar-filled foods.9 In addition to a poor diet, cholesterol levels have even been shown to increase by 11% in medical students during periods of stress such as examination times.10

Workplace design and environment has also been shown to contribute to long-term negative effects in poor health and increased stress. Independent variables such as office seating ergonomics, work area design, acoustics, lighting, working hours, and humidity may lead to increased work stress.11 This results in a vicious cycle giving way to an environment that encourages poor ergonomics and stress. Poor ergonomics and work-related musculoskeletal disorders often present as symptoms of neck, spine, and upper extremity pain and can be traced to static posture and sustained muscle activity31, which is only further amplified by stress and high mental workload.32

Stress contributors and negative effects thereof are plentiful. Unfortunately, poor management of stress during medical school results in a further increase in stress during residencies and entering clinical practice.33 Among 12 of the most stressful jobs in the United States, 8 are reported to be in the medical profession.34 Therefore, it is crucial that those entering the medical field learn how to manage and cope with stress early in order to better handle any future stress and the potentially compounding effects it could have later in their career.

Not all stress can be avoided, but it can be managed.Health promoting evidence-based stress management techniques include cognitive based therapy, mindfulness-based stress reduction (MBSR), and emotional freedom techniques as well as counseling, group therapy, acquired time management skills, nutrition awareness, autogenic training (AT), progressive muscle relaxation (PMR), guided imagery (GI), pharmacologic intervention, diaphragmatic breathing, and healthy physical activity.12Numerous studies show that exercise, aerobic fitness, a healthy diet, and time management skills significantly influence the quantity and quality of responses to psychological stress.13,35,36,38,39 Additionally, several studies highlight the beneficial effects of interventions such as MBSR and somatic relaxation in decreasing stress, tension, and anxiety in a variety of populations.12,18,20,23,30,50

This proposal aims to provide feasible and effective strategies and recommendations to facilitate the physical, psychological, and academic well being for medical students at UNC-Chapel Hill. With over 750 medical students, there is an unmet need for improved stress management strategies in this population. This plan, named StressLess TarHeals, will include counseling in nutrition, physical activity, and time management; introduce MBSR through meditation and mindfulness education; and provide somatic relaxation through PMR, GI, AT, postural exercises, and diaphragmatic breathing.

**Background:**

It is assumed that medical students possess a greater knowledge about healthy lifestyle and habits when compared to other students. Unfortunately, there is no evidence indicating that this knowledge translates into practice in terms of maintaining good health.44

Research promotes the utility of using the health belief model (HBM) to explain and predict various health behaviors.47 This theory has become a framework to explain why people do or do not engage in a variety of health-related actions. Evidence suggests one of the most important factors for predicting the physical well being of medical students is their own attitudes toward health promotion, illness prevention, and exercise.45 Positive attitudes in these areas are vital for our soon to be health professionals as they are the future of the medical field. Students who ignore practicing a healthy lifestyle are more likely to fail to establish beneficial health promotion opportunities for their patients.46 Further studies are needed to evaluate the health status of future medical professionals.

In addition to health-related attitudes, increased self-efficacy plays a key role in modifying high-risk behaviors and has been shown to increase the likelihood of positive health behavior change.48 Moreover, self-efficacy has been recognized as a critical factor in determining whether an individual, when faced with an aversive experience such as stress, will initiate coping strategies to manage that stress successfully.49 In the context of medical students, self-efficacy implies the beliefs or confidence that students have in their ability to successfully manage their stress. Therefore, students could learn to recognize and cope effectively with the stressors they encounter through the development of self-efficacy and stress management strategies that enhance positive attitudes.

No gold standard exists for the content of stress reduction programs for medical or allied health professional students.7 In a review of stress management programs in medical students and residents, Shapiro et al. observed that most programs recruit volunteers to participate. They report that this may leave a gap in reaching the students most in need of the service.7 Additionally, these authors found that in making such programs mandatory, some participants may resent the involvement or feel a decreased competence due to the requirement of attending a stress management program.7

While many students may consider stress reduction strategies to be common sense, it appears that few actually practice them consistently. Though medical students may be aware that physical activity is beneficial, some studies report less than half of their medical students partake in recommended bouts of exercise. Multiple lines of evidence suggest that greater sympathetic nervous system and hormonal capacities elicited from habitual physical activity are associated with a more positive response to stressful situations, including decreased anxiety and emotional upheaval as well as overall increased tolerance for stressful situations.35 Physical activity and exercise alleviates symptoms associated with mild to moderate depression and anxiety, improves self-image and well being, social relationships, and cognitive functioning, and alters aspects of Type-A behavior along with the physiological responses to stress.38 Those who exercise regularly show higher levels of norepinephrine and prolactin early in a stress period, more rapid heart rate recovery following the stressors, and lower levels of anxiety and stress at the conclusion of a session allowing them to cope better when exposed to stressors.39 This program aims to increase participation in regular physical activity by educating students in the necessity of exercise as well as counseling and proposing realistic physical activity goals and initiatives, thereby reducing the effects and prevalence of stress.

In addition to physical activity, a well-balanced nutritious diet can allow for more energy, concentration, and decreased distress. For example, whole-grain carbohydrates and comfort foods, such as a bowl of warm oatmeal, can boost levels of serotonin and stabilize blood sugar. Vitamin C, spinach, and fatty fish are just a few of the many foods that can cut levels of stress hormones such as cortisol and adrenaline while simple carbohydrates should be avoided.36 Nutrition counseling and healthy eating habits are imperative in preventing stress and combating negative health effects such as increased cholesterol8 and hypertension.37 These items will be vital to managing stress in this initiative.

The concept of time management is generally defined in terms of clusters of behaviors, which facilitate productivity and alleviate stress. These strategies have been widely studied, are shown to increase academic performance41, and are frequently suggested by academic assistance personnel.42 However, students regularly ignore such recommendations and find themselves in great distress before exams.40 Research supports the utilization of a multidimensional time management construct. Education and utilization of strategies such as goal setting, prioritizing, listing, organization of space, and perceived control of time are helpful in reducing stress.42 Practicing such time management skills will prove beneficial not only during medical education and training, but also upon entering the field as a medical professional.43

In addition to stress management education, MBSR has been shown to be an effective intervention for a range of populations, including medical students. MBSR assumes that greater awareness of the here-and-now will provide a clearer and more accurate perception, reduce negative affect, and improve energy and coping.12 Additionally, systematic mindfulness training can influence brain areas involved in regulating attention, awareness, and emotion.26 It can also help control severe headaches27 and is effective for decreasing anxiety and depression.28 One component of MBSR is mindfulness meditation or transcendental meditation. Mindfulness meditation has been reported to decrease mood disturbances specifically in medical students.20 Benefits of such meditation include reduced anxiety, pain, and depression, enhanced mood and self-esteem, decreased stress30, and faster recovery from stress.12

Another form of relaxation, somatic relaxation, is an intervention that has multiple components that aim to give a comprehensive course on stress reduction via focus on bodily relaxation.20 PMR is a technique that helps reduce pain and tension, creates a pleasant mental state, reduces anticipatory anxiety and anxiety in response to stress.20 Additionally, studies have shown that it helps to improve concentration, as well as energizing and improving sleep patterns.21 Further benefits include a reduction of generalized anxiety, decreased blood pressure50, and decreased headaches.22 AT aims to achieve deep relaxation and ultimately reduce stress as well.12 A meta-analysis has shown that AT has been useful in tension headaches and migraines, mild to moderate essential hypertension, anxiety disorders, and mild to moderate depression.23 However, the downside is that mastering these exercises, either from an instructor or on one’s own, may take up to 4 to 6 months.12 Another relaxation technique is GI, which has been shown to be successful in stress reduction24, treatment of depression25, and even pain management.12 Lastly, the use of deep, diaphragmatic breathing has been successfully used in the management of acute stressful tasks, showing that a slow-breathing technique can have a significant effect on the improvement of hemodynamic changes during stress.51

Multiple intervention strategies have proven to be effective in decreasing stress in medical students; however, little is known regarding the efficacy of combining these strategies.  One particular study incorporated education by teaching participants how to change maladaptive cognitions as well as practice meditation and progressive muscle relaxation.18 Holtzworth-Munroe et al. demonstrated beneficial results with 40 first and second-year medical students, providing education and MBSR interventions for 6 weekly 1-hour sessions. At a 10-week follow up, the intervention group reported increased skills in coping with school-related stress.18 Both mindfulness meditation and somatic relaxation have been shown to reduce negative psychological states and enhance positive states of mind for students experiencing significant distress. However, mindfulness meditation may have a specific ability to reduce distractive and/or ruminative thoughts and behaviors, which may be a unique mechanism it can provide in reducing distress.20

In looking at a review of stress management programs and interventions, there are still several conclusions yet to be drawn. For example, while follow ups seem to support the effectiveness of interventions, the durations of stress management effects remain unclear.7 In the same vein, there have been heterogeneous interventions, lack of control groups and randomization, and few validated outcome measures used. These limitations make it difficult to draw consistent conclusions as to which stress management programs are the most effective for the target population of medical students.7

Although there is a large literature base on stress management in general, the specific application of these interventions in medical students has been largely unexplored.55 Several gaps in the literature have been identified including: gaps in the current knowledge of long-term effects of physical activity on stress; gaps in knowledge regarding medical students’ nutrition habits and this independent variable’s effect on stress alone; lack of studies demonstrating efficacy of combined interventions; and gaps regarding who is facilitating (and who is best to facilitate) stress management techniques and programs. For example, are trained professionals implementing these programs and are professionals necessary to introduce such initiatives? Despite noted gaps in literature, given the current body of supportive evidence for individual components of stress management programs, this program plans to contribute similar positive results using a multi-pronged approach of previously successful interventions for this target population.

**Project Description:**

The purpose of the “StressLess TarHeals” initiative is to design and implement an effective stress management program for medical students at UNC-Chapel Hill. By identifying students with limited stress management capacity, this program will be able to provide the appropriate support and effective strategies to cope with periods of intense stress and prevent associated health issues.

Objectives**:**

The primary goal of “StressLess TarHeals” is to improve the physical and emotional health of UNC-Chapel Hill medical students to promote an optimal learning environment and personal well being. Specific aims include:

* To implement a multi-interventional stress management program for students in UNC-Chapel Hill’s Medical School
* To enable students to measure their stress levels, recognize the main stressors they are facing, and to identify their main coping styles
* To increase medical students’ abilities to cope with stress and decrease risk of associated consequences
* To increase the understanding of benefits of nutrition, regular physical activity, and time management on health
* To introduce and enhance MBSR through meditation and mindfulness education
* To increase participation in somatic relaxation techniques such as PMR, GI, AT, postural exercises, and diaphragmatic breathing
* To demonstrate improved quality of life in medical students who participated in the program

Proposed Intervention Methods:

“StressLess TarHeals” will include 3 phases: an initial screening/discussion with subjects, stress management program implementation, and an assessment of outcomes immediately following the program and at 4-month follow up. Due to the nature of this proposal and our targeted population for intervention, volunteers will be recruited directly from UNC’s medical school. This stress management training program will include multiple components spanned over 6 weeks in 1-hour per week sessions which has been demonstrated to be effective.18 Interventions exist in 3 categories: 1) Education, 2) MBSR, and 3) Somatic relaxation. Each stress management training session will consist of a 30-minute educational session on topics including information and counseling regarding nutrition, importance of physical activity, time management strategies, and MBSR techniques. All educational discussions will then be followed by a 30-minute interactive lab including training in the MBSR and somatic relaxation techniques of meditation, PMR, GI, AT, postural exercises, and diaphragmatic breathing techniques.

The proposed site for the program will be UNC-Chapel Hill’s easily accessible Health Sciences Library (HSL) in close proximity to the School of Medicine classrooms. This location will allow for decreased burden of attending such a program due to its adjacency to the medical school. The city of Chapel Hill offers a public transportation system52 for those who do not have other means of transportation to this area of campus. The initial assessment, forum, and educational discussions will take place in the library’s conference room of adequate size for participants. Lab sessions may be held outside, weather permitting, or in the basement of the HSL, which will be reserved ahead of time.

**Intervention Phase I: Initial Screening**

A focus group comprised of UNC medical students will be recruited to collect information regarding pertinent stress issues and to investigate study conditions such as environment, stress triggers, eating habits, perceived level of stress, knowledge of resources, and physical activity. This focus group will allow further investigation into the specific stressors of medical students at UNC-CH, leading to optimal intervention approaches for this specific population’s needs. Participants of this program will then receive an initial screening to provide baseline data. During this initial screening, participants will fill out a variety of instruments which will also be completed at the conclusion of the program and at a 4 month follow up. These instruments include the DASS-21; the Medical Students Questionnaire (MSSQ); the Brief COPE inventory; a nutrition self-report questionnaire; a self-report questionnaire regarding frequency, intensity, type, and duration of exercise; 3-minute step test; and the World Health Organization’s Quality of Life Questionnaire (WHOQOL-BREF). Following the questionnaire session, participants will be given input regarding the relationship between stress, stressors, and coping methods with an elaboration on positive and negative coping methods, as well as a schedule for the remainder of the program.

*Rationale for selected Outcome Measures:*

At this time, there is no gold standard for assessment of stress management.2 The DASS was developed in 1993 to assess the severity of core symptoms of depression, anxiety, and tension (or stress) over the previous week. This instrument provides a grand spectrum measure of distress, indicating the severity and frequency of symptoms.53 The DASS-21 consists of 21 items broken into 3 main scales which are depression, anxiety, and stress to be scored on a 4 point scale. Importantly, this measure is suitable to track changes in severity over time, has been tested specifically on students53, and has been used in previous stress management programs directed towards medical students.54 The MSSQ and Brief COPE inventory have also been previously validated.55,56 The MMSQ classifies stressors unique to medical students into 6 major groups: academic-related stressors, intra- and interpersonal related stressors, teaching and learning related stressors, social-related stressors, drive and desire related stressors, and grouped activity-related stressors. Participants identify the intensity of their stressor measured on a 5-point Likert scale. Combining this instrument with the Brief COPE inventory, which consists of 15 coping scales that are totaled and formulated to determine an individual’s main coping strategy55, will be beneficial in determining the full spectrum of stress and each participant’s reaction to it. Although self-report measures of stress are important, examination of physiologic measures of stress and activity, such as the 3-minute step test, should supplement them to validate the effectiveness of the program.2 The 3-minute step test will be used in combination with self report to determine participants’ tolerance for activity and fitness level. Finally, the WHOQOL-BREF has been validated specifically for use with medical students14,16, and will provide insight on overall quality of life for each participant.

**Intervention Phase II: Stress Management Program Implementation**

Intervention will take place over a 6 week time period in 1-hour per week sessions. Each session will have a 30-minute education component and a 30-minute lab component. For the most part, all education and lab components will be led by a PT. However, when appropriate, specialists will be brought in to discuss and lead certain topics. For example, when nutrition is discussed in detail, a registered dietician will lead the education session. As a form of meditation, a yoga instructor will be utilized to lead a lab session on yoga. Topics will vary each week, as no research has shown the effectiveness of a particular order of stress management strategies.7

Education sessions are meant to be interactive and discussion-oriented. While there will be one main speaker, questions will be welcomed throughout the session, encouraging an open learning environment. Two weeks will be devoted to the topic of physical activity, 1 week for nutrition, 1 week for time management, and 2 weeks for MBSR education. Each session will begin with a self-reflection and sharing of current practices. A PowerPoint will be utilized for each topic to provide visual representation of information; additionally, handouts will be provided so that the students do not feel pressure to take extensive notes. Following the opening reflection of participants, the speaker will discuss the respective topic of the week, leaving room for questions and commentary along the way.

Lab sessions will also be very interactive and will require the participant to fully dedicate 30 minutes to focusing on the activity that week. Two weeks will be devoted to MBSR techniques including mindfulness meditation and yoga, 1 week to somatic relaxation and AT, 1 week to PMR, 1 week to GI, and 1 week to diaphragmatic breathing and postural exercises. These labs are structured towards a group setting and are meant to be generalized techniques, but individuals are free to discuss more in-depth techniques with the instructor after the session has ended. From introduction to these methods, participants will hopefully learn what techniques will be the most meaningful and effective in their ability to reduce stress.

*Rationale for Intervention Phase II:*

Students will participate once a week for 6 weeks. The goals of stress reduction programs are to decrease stress in a concise and time-efficient manner, so as not to overload the individual with more time commitments. Research has shown that 6 weeks is a sufficient timeframe to induce change.18 Topics for both the education and lab sections are arbitrarily designated a 1- or 2-week slot based on depth and content to be covered. No study has been able to show rationale for an order of topics to be discussed, but having each session broken up into an education and lab component will do well to hold the attention of a student audience.7 While handouts will be provided with content relevant to both the education and lab session each week, no physical activity logs or assignments will be given. Again, this program is not designed to add to the student’s workload, but is purposed to provide effective strategies for managing stress and stress-related topics in short weekly sessions.

The goal of providing a wide variety of topics is to expose students to the spectrum of techniques that are available and have been shown to reduce stress. It is not the goal of this program to fully train students how to master these techniques; rather, by providing introductory educational and lab components, the hope is that students will be able to detect which stress reduction strategies best fit their personality and lifestyle, and that they will be able incorporate these techniques in their daily lives.

**Intervention Phase III:  Assessment of Outcomes**

The third and final phase of the intervention will involve a reassessment of outcome measures. As previously discussed, outcomes of interest will include the MSSQ, DASS-21, the Brief COPE inventory, a nutrition self-report questionnaire, a self-report questionnaire regarding frequency, intensity, type, and duration of exercise, 3-minute step test, and the World Health Organization’s Quality of Life Questionnaire (WHOQOL-BREF). These measures will be administered at baseline, at the conclusion of the program, and 4 months post-intervention. Furthermore, it is hypothesized that as a result of the intervention secondary outcomes will also occur. These may include a decrease in resting heart rate, blood pressure, BMI, normalized respiratory rate57, and enhanced heart rate recovery after exercise58; all of which will be measured in addition to the primary outcome measures at the established time intervals. A follow up survey will be provided at the end of the 6 week intervention period to garner participant satisfaction with the program and gain qualitative reports of the impact of the program.

*Anticipated Outcomes:*

Anticipated outcomes of the “StressLess TarHeals” program project that by the conclusion of the 6-week intervention:

* 95% of participants will demonstrate an increase in reported quality of life as indicated by a 20% increase in score from baseline on the WHOQOL-BREF
* 90% of participants will report a 10% decrease in the intensity of experienced stressors as indicated by a decrease in score across MSSQ and DASS-21 domains
* 95% of participants will be able to understand and accurately identify their main coping styles as indicated by change from baseline to follow up using the Brief COPE inventory
* 95% of participants will report increased knowledge of nutrition and exercise by naming at least 1 health benefit in each category
* 95% of participants will report engaging in at least 1 MBSR or relaxation technique weekly
* Participants will demonstrate a 90% compliance rate measured by program attendance
* 85% of participants will fall within the age-adjusted standards for heart rate recovery after completion of the 3-minute step test59

Anticipated outcomes of the “StressLess TarHeals” program project that at 4-month follow up:

* 60% of participants will have maintained at least a 20% increase in their WHOQOL-BREF from the 6-week assessment
* 60% of participants will have maintained at least a 10% decrease in the intensity of experienced stressors as indicated by a decrease in score across MSSQ and DASS-21 domains
* 70% of participants will demonstrate continued understanding and be able to accurately identify their main coping styles as indicated by change from 6-week to 4-month follow up using the Brief COPE inventory
* 80% of participants will maintain increased knowledge of nutrition and exercise by naming at least 1 health benefit in each category
* 50% of participants will report engaging in at least 1 MBSR or relaxation technique weekly
* 75% of participants will fall within the age-adjusted standards for heart rate recovery after completion of the 3-minute step test59

**Program Evaluation:**

At this time, no proven standard exists for assessment of stress management.2 With the conclusion of this program, a formal evaluation will be carried out with the intent to assess the program’s goals and to identify areas needing improvement in order to create more effective and efficient future programs. Evaluation questionnaires will be provided for participants to rate the overall perceived success of the program. Additionally, participants will be asked to rate the quality of the instruction, pertinence of the discussion topics, and usefulness of the program in its ability to achieve the objectives. In an open-ended section, participants will be asked to identify the most important thing they learned and describe the most important aspect that can be improved.  The 7 questionnaires and functional tests administered at the initiation and conclusion of the program will help to justify the individual and overall success of the initiative by fulfilling all of the objectives outlined above. The follow up assessment scheduled 4 months post-program will help to provide insight into long-term effects and compliance of this program.

Limitations and Barriers**:**

There are numerous potential barriers to the successful implementation of this program. First, no gold standard exists for the content of stress reduction programs for medical or allied health professional students.7 The following potential barriers have been identified: attendance/adherence issues, as medical students may feel too busy to attend a stress management program or begin to implement these practices in their daily routine; cooperation with UNC Health Science Library for meeting space; not being able to address all facets of contributors to stress and anxiety; difficulty with transferability of results found in the general medical student population; and an unequal ratio of males to females, as there may be less participation of males secondary to their reluctance in seeking help for these types of issues.11

Additionally, considerable reliance on self-report measures raises concern about the validity of expected conclusions along with the validity of questionnaire scales. Development and validation of more objective measures are needed to substantiate the results of this program.

Finally, little is known regarding the efficacy of combining intervention strategies. Other than results from one other study18, there is a paucity of evidence to suggest that combining interventions is effective. While results from follow ups seem to support the usefulness of interventions, the durations of stress management effects remain unclear.7 These limitations make it difficult to draw conclusions as to which stress management strategies are the most effective for the target population of medical students.7 However, results from this program may provide preliminary evidence on the success of combining multiple stress management strategies.

Relevance and Future Plans**:**

In summation, it has been well documented that medical students experience stress throughout their education and training which may lead to unfavorable consequences if not managed properly. The health and wellness program, “StressLess TarHeals” will address this issue on the campus of UNC-Chapel Hill. Discussions as well as functional tests and measures will assess the specific needs of this population at this particular university. By providing stress management awareness, education, and coping strategies, this evidence-based program will offer the opportunity for student participants to change their current health behaviors in order to meet their specific stress-management needs. “StressLess TarHeals” findings may potentially impact the health and well being of hundreds of UNC-CH medical students and contribute to the current body of knowledge regarding stress management in students. Positive results may warrant the expansion of further workshops in stress management to UNC’s School of Medicine as well as medical universities across the country. In addition, if funds are available, expansions of the program could be made to include other allied health professional students. Furthermore, because hospitals are considered to be one of the most stressful work environments9, a similar stress management program may derive and prove beneficial for hospital employees. Thorough evaluation of this program will add knowledge regarding the success of a wellness initiative for this population and present opportunities for improvement with similar programs by identifying areas of strength and weakness.

*“I have neither given nor received unauthorized aid on this assignment”*

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