Impact of Stress Management on Learning in a Classroom Setting

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IMPACT OF STRESS MANAGEMENT ON LEARNING
IN A CLASSROOM SETTING

A Thesis
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Master of Public Health

By
Pankaj Mandale
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IMPACT OF STRESS MANAGEMENT ON LEARNING
IN A CLASSROOM SETTING

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Stress is an important feature of the lives of college students and can impact negatively on learning. The effectiveness of an in-class stress management intervention for improving course content retention was tested with a cross-over design in two introductory graduate biostatistics classes. Each class met one day per week for the duration of the semester, and was taught by the same instructor, following the same syllabus. A pretest duplicating items on the midterm and final exam was administered to all students at the first class meeting. Identical midterm and final exams were administered in both classes. During the first half of the semester, each class session in one section was preceded by a ten minute deep breathing stress management procedure (n = 30). During the second half of the semester this procedure was discontinued in the first section and implemented in the other section (n = 10). There were no significant differences by age, citizenship, or gender between the two sections of the course. Based on the statistical analyses between the two groups the study did not give a clear answer if stress management was effective in improving learning.
Chapter 1

The American Psychological Association (APA) released their annual state of stress survey in the U.S. in 2008. The APA reported that 33% of Americans rated their stress levels as extreme and eight out of 10 believed that the main cause of sickness was due to stress (APA, 2008). Most Americans report having physical and emotional symptoms such as fatigue, feelings of irritability or anger, insomnia, depression, lack of interest or motivation, headache, muscular tension, and weakness due to stress (Bethune, 2008). In addition to these symptoms, excess stress caused chest pains, rapid heartbeat, over eating, upset stomach, dry mouth, increased frequency of colds, lack of concentration or focus, memory problems or forgetfulness, jitters, short temper and anxiety. Unhealthy behaviors like smoking, gambling, excessive drinking and overeating or skipping meals were also attributed to excessive stress. This study helped to identify sources of stress, effect of stress on concentration and memory and recognized ways some people deal with stress.

Mitchell (2010) explained the effect of stress on memory. Long term stress or big stressors greatly affect the sympathetic nervous system which disrupts the function of the hippocampus. The hippocampus is the part of the brain which is responsible for placing and retrieving memories. It is extremely sensitive to glucocorticoid levels in one’s blood. Glucocorticoid helps to retrieve memories. During prolonged stress and exposure to excessive glucocorticoid, the hippocampus neurons absorb less glucose, decreasing energy supply. Prolonged increases in blood glucocorticoid levels have the potential to damage neurons of the hippocampus, thereby impairing memory & concentration.
Purpose of Study

The purpose of this study was to determine whether an in-class stress management intervention can improve test performance. It was assumed that students experience stress and anxiety which adversely affected their test performance. The stress management intervention was expected to decrease their stress and anxiety, and improve test performance.

Need for the Study

Excessive stress is considered to be one of the main factors affecting students’ academic performance (Paul, Elam & Verhaut, 2007). Various stress management techniques used either individually or in combination appear to have shown some minimal effectiveness in helping college students cope with stress. Techniques like hypnosis (Yu, 2006), Transcendental Meditation (Barnes, 2003), and deep breathing meditation (Paul, et al., 2007) were used with college and university students to demonstrate the positive effect (i.e., reduced anxiety, positive coping and improved academic performance) of these stress management approaches.

However, the aforementioned literature on stress management programs used simple pretest-posttest designs which are limited in their ability to infer cause and effect. Given the design limitations of these stress management interventions, a quasi-experimental approach was performed in this study. This intervention was designed to decrease stress and anxiety among students and show knowledge gains in the intervention group as compared to control group not receiving the intervention.

Hypothesis

The following hypothesis will be tested:
1. Graduate students receiving ten minutes of stress management before each class session will show better test performance than the control group.

**Delimitations**

This study is delimited to graduate students at Western Kentucky University during the fall 2009 semester, who participated in the stress management program as part of their biostatistics class (Public Health 520).

**Limitations**

This study has the following limitations:

1. Caution should be exercised when generalizing results of this program since participants may not be representative of all students at the university;
2. Some students may not experience stress arousal to warrant an intervention;
3. Caution should be exercised when generalizing to the non college population;
4. Comparison of nonequivalent study groups may mask program effectiveness;
5. Individuals who practiced the stress management techniques outside the class setting may be at an advantage to cope with stress well and perform better on exams.

**Assumptions**

The following assumptions are made in the study:

1. It is assumed that the participants in the study will perform the stress management technique to the best of their ability in the class room setting as instructed.
2. It is assumed that the tests used in this study accurately measure the content of the course.
Definitions

**Hypnosis**-- A trance-like state in which a person becomes more aware and focused and is more open to suggestion.

**Stress**-- The response of the body to physical, mental, or emotional pressure. This may make a person feel frustrated, angry, or anxious, and may cause unhealthy chemical changes in the body.

**Transcendental Meditation**--A mental technique used to promote relaxation, reduce stress, and improve quality of life. Transcendental Meditation is the registered trademark of the Maharishi Foundation Ltd, also called TM.

**Yoga**-- An ancient system of practices used to balance the mind and body through exercise, meditation (focusing thoughts), and control of breathing and emotions.

**Stress Management Technique**-- Any combination of education, skill acquisitions and practicing of skills aimed at reducing at stress (Scott, 2007).

**Meditation**-- “is the practice of uncritically attempting to focus your attention on one thing at a time” (Martha, 1995).
Chapter 2

Everly (1990) observed that biochemical changes take place in the body in response to stress; changes like adrenal enlargement, gastrointestinal ulcers and thymicolympathic shrinkage. He reported these signs in people who had high levels of stress for a long duration of time. These changes in the body were recognized as objective indices of stress. This work again confirmed previous research by Selye who termed the response pattern as the ‘general adaptive syndrome’ (GAS) or ‘biologic stress syndrome’ (1936).

Previous to Selye’s work, Walter Cannon (1920) had earlier defined stress as, “the fight or flight response to describe a mobilization of the organism that prepares it more effectively to aggress or to flee.” Numerous researchers have demonstrated that with excessive stress, physiological and mechanical responses of the body are consistent among individuals. What is different is the intensity and length of the response changes (Cox, 1981). Excessive intensity or a lengthy period engaging the stress response is what people generally refer to as stress.

Stress is considered to one of the most important factors that affects the health of people. Everly (1990) pointed out that stress is defined by people in different professions in different ways. A traffic controller may feel stress is just a problem of concentration, an athlete may feel it is a muscular tension, the biochemist and endocrinologist feel it is a chemical event in the body. He also argued there is no single factor can be labeled as stress inducing, because multiple factors play a vital role in inducing stress at a given point of time. Factors like pain, fatigue, poor health, fear, emotional arousal etc. are all capable of producing stress.
Selye (2001) showed that the continuous exposure to excessive stress can cause a stage of adaptation or resistance by the body. In this stage of resistance, the body responds by secreting granules in the bloodstream which are discharged by the adrenal cortex. This depletes the corticoids containing lipid storage material. Upon depletion of corticoids, this stage was followed by the stage of exhaustion, where maximum wear and tear and maximum biological activity takes place in the body. This may leave some minute irreversible chemical scars throughout the body. This process has also been associated with accelerated aging (Selye 2001).

Alan and Lazarus (1991) examined Selye’s stress response mechanism, relating these adaptations to nervous and vascular systems of the body. The nervous stimulation caused a general stress response. This response caused a discharge of hormones, resulting in the involution of lymphatic organs, enlargement of the adrenals, fatigue and other signs which can produce injury to any part of body. The stressors or mediators were also found to excite the hypothalamus complex bundle of nerve cells and fibers. It is in the hypothalamus where corticotropic hormone releasing factor is formed.

Corticotropic hormone is sent to the pituitary gland which releases the adrenocorticotropic hormone (ACTH). The ACTH then triggers the secretion of corticoids from the adrenal cortex. The corticoids suppress immune reaction, inflammation and various enzyme responses which help the body to cope with potential pathogens or stressors along with other hormones like mineralocorticoids, somatotrophic hormone (STH) or growth hormone. These hormones (catecholamine and adrenaline) play a great role in one’s adaption to stress. Adrenaline helps to accelerate the pulse rate, to elevate blood pressure and blood circulation in muscles and stimulate the central
nervous system (CNS). Adrenaline also enhances the blood coagulation mechanism to protect against excessive bleeding if injuries occur during time of stress.

Although numerous physical mechanisms accompany the stress response, there are also psychological considerations that accompany the physiological response. Lazarus & Folkman (1984) defined coping as “constantly changing cognitive & behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person.” Coping was termed to be an environmental or cognitive strategy to ease the stress response. A coping response subsequently follows after a physiological stress response. Homeostasis of the body is achieved by successful coping. Coping is therefore an essential component of dealing with stress responses.

Lazarus explained coping as a complex interaction of the cognitive/affective domain. Everly (1990) described coping, in the form of outcomes that demonstrated either an adaptive or maladaptive strategy. Adaptive coping strategies are conceptualized as to stress reducing. Examples are people performing exercises, relaxation techniques like Yoga, meditation, deep breathing, and proper nutrition. On the other hand maladaptive coping strategies were conceptualized as reducing stress for a short period of time but with potential long term adverse effects on health. Examples include people under alcohol/drug addiction, cigarette smoking and interpersonal withdrawal. When a person successfully uses an adaptive coping strategy, target organ activation is reduced or eliminated and homeostasis is reestablished. However the chances of target organ disease are increased in maladaptive coping strategies. Numerous studies have been conducted to show the effect of excessive stress on coping behavior.
Struthers, Perry, and Menec (2000) examined 203 college students’ academic coping style and emotional factors, to measure their academic stress and performance. Student Coping Instrument (SCOPE) was used to measure student coping style. The structural equational analysis, showed problem focus coping and motivation to be more effective in reducing academic stress and improving course grades. Students having low course grades had greater academic stress. Thus results showed problem-focused coping helped students to be motivated and perform better.

Similarly, Lo (2002) conducted a study to examine stress coping mechanisms in students. This study confirmed the findings reported by Struthers, et al. (2000). Lo conducted a cohort study to identify the perception and sources of stress, the coping mechanism used and the relationship of self-esteem in 332 nursing students. The questionnaire consisted of the general health questionnaire (GHQ-12), the Self-esteem Scale, and the modified Ways of Coping Scale. Results showed 1st year students experienced high level of stress as compare to students in 3rd year. An association was reported between avoidance in coping behaviors and negative Self-esteem. Positive self-esteem was correlated with proactive coping behavior. Coping strategies used by students were: problem solving, recreation & sports, meditation and yoga. Thus, results showed positive self esteem played an important role in coping behavior.

Reda (1994) examined the level of stress in relation to locus of control and self esteemed among 675 (202 males and 473 females) second year undergraduate students. The Academic Stress Questionnaire (ASQ) and Life Stress Questionnaire (LSQ) were used to access student academic and life stress levels. Locus of control was assessed using the Multidimensional Multi-attributional Scale of Causality (MMCS) and the
Rosenberg Self Esteem Scale to access student’s self esteem. Results showed studying for exams as the greatest stress causing factor among students with 77.6% of students in the moderate stress category and 10.4% in the serious stress category. Differences between male and female students were observed in both academic and life stress with female students reporting higher levels of stress than males. Regardless of gender a positive correlation was observed in locus of control and academic stress. Students with high self esteem showed less stress as compared with students having low self esteem.

Aktekin, Karaman, and Senol (2001) also reported that higher stress scores decreased academic performance. Aktekin assessed the psychological change in undergraduate medical students in Antalya, Turkey. Participants were all first year undergraduate students in the areas of medicine, economics and physical education. A detailed self report questionnaire was given during the first registration term of 1996, followed by a questionnaire the next year. Components of the questionnaire included a 12-item General Health Questionnaire (GHQ), the Spielberger State-Trait Anxiety Inventory (STAI) and the Beck Depression Inventory (BDI). Results showed a significant increase in the ‘stressful life events’ from year 1 to year 2 along with a significant rise in the anxiety level among students from year 1 to year 2. However the Beck Depression Inventory scores were high for students of year 1, with a decrease of scores in year 2. Findings suggested that students having low self esteem had difficulties in academic performance and suffered more stress anxiety. Conclusions were that students with low self esteem and excessive stress utilized maladaptive coping strategies.

Barker (1987) reported excessive stress as the significant risk factor for various maladaptive coping outcomes among youth. The maladaptive coping may include anger,
frustration, abuse related events, peer harassment and chronic victimization (Barker, 1987; Compas, Connor-Smith, Saltzman, Thomsen, and Wadsworth, 2001). The harmful effects of stress have been considered to also cause feelings of worthlessness and being overwhelmed (Hill and Saranson, 1966).

Stewart, Lam, and Betson (1999) also confirmed the role of maladaptive coping. He conducted a longitudinal study of stress-related measures and academic performance during the first two years of medical study. Participants were 121 first year medical school students. Measures of academic performance both before entering medical education and during medical school were obtained. The State-Trait Anxiety Inventory was used to assess trait anxiety and depression was measured by Beck Depression Inventory. Stress management was assessed using a self report of coping strategies. Students were asked to indicate how they responded to stressors during the previous two weeks.

Analysis of the data showed a relationship between grades and stress measures. Pearson correlation coefficient values (0.57, 0.74, 0.67, 0.53 and 0.52) for the five assessment periods of the first two years of medical school, suggested that stress and academic performance were correlated (Steward, 1999). The study reported excessive stress to adversely affect the academic performance among students. Students who reported excessive stress showed poor academic performance, as compared to students reporting lower stress.

Vos (2008) also confirmed the role of excessive stress on academic performance. He conducted a study to determine if stress management techniques like hypnosis helped to improve overall academic performance in college students based on the Greeff self-
concept questionnaire. The Greeff self-concept questionnaire consisted of 52 true/false response type items grouped into five subscales, namely, the personal self-concept; the academic self-concept; the physical self-concept; and an honesty scale. Vos randomly selected 120 students from the Psychology Department of the University of Stellenbosch in South Africa. The group represented the relatively small student population of the university. One experimental group was exposed to active alert hypnosis while the other group was exposed to relaxation hypnosis. Both groups were exposed to weekly sessions for a period of eight weeks. A comparison group of 30 students underwent only progressive relaxation for the same period of time. The posttest measurements’ were based on the Greeff self-concept questionnaire which showed an overall academic improvement in students within both treatment groups.

Whitehouse, Dinges, Orne, Keller, Bates, Bauer, Morahan, Haupt, Carlin, Bloom, Zaugg and Orne (1996) study had also confirmed the role of hypnosis and relaxation intervention in academic performance. The study further tested the effectiveness of a self-hypnosis/relaxation intervention to decrease physiological distress and moderate immune system reactivity to examination stress. Thirty-five first year medical students participated in the 19 week study. Twenty-one students were randomly selected as an intervention group for training in the use of self hypnosis and 14 students served as comparison group. Both groups maintained daily records related to mood, sleep, physical symptoms, and frequency of relaxation practice. The training sessions lasted approximately 90 minutes, one day a week, throughout the semester. The first session was to assess the student’s hypnotic ability using the Harvard Group Scale of Hypnotic Susceptibility. During the following weeks the self hypnosis assessment was done using
the Inventory of Self-Hypnosis (ISH). Students were encouraged to do self hypnosis exercises on their own for at least 15 minutes each day. Self-reported psychosocial and symptom measures, as well as blood specimens, were obtained at four time points: orientation, late semester, and examination period and post semester. Based on the baseline comparison, the results showed no intergroup difference on immunological measures. Students from the self hypnosis group reported less distress and anxiety than their nonintervention counterparts. Thus the research confirmed the effectiveness of self hypnosis in reducing distress and anxiety to examination stress.

Rosenzweig, Reibel, Greeson, and Brainard (2003) showed the Mindfulness-Based Stress Reduction (MBSR) course was effective in improving the coping skills and reducing emotional distress in medical students from Jefferson Medical College, Pennsylvania. A prospective, nonrandomized study was conducted on 302 second year medical students, out of which 140 students were selected to participate in the 10 weekly session seminars with 90 minutes of contact time and 162 students were selected as controls. The MBSR course taught students breathing awareness, yoga, eating meditation, walking meditation and guided imagery (mountain/ lake meditations). Participants also received an audiocassette for daily meditation practice. The participants were expected to practice the formal meditation for 20 minutes daily, 6 days per week. The results showed improvement among students on tension-anxiety, confusion-bewilderment, fatigue-inertia, and vigor–activity subscales when compared with the baseline total mood disturbance.

A similar study confirmed the research done by Rosenzweig, et al. Oman, Shapiro, Thoresen, Plante, and Flinders (2008) conducted the MBSR and Easwaran’s
Eight-Point Program (EPP) on 47 randomly selected undergraduate students from the University of California and out of these participants, 16 received the MSRB, 16 received the EPP and 15 served as a waiting list control group. The training took place in 8 weekly meetings of 90 minutes each, which involved meditation, attitudinal and motivational support, sitting meditation, informal discussion, and passage meditation, focused attention and slowing down. The pretest, posttest, and 8 week follow up were measured for perceived stress with a 10 item version of the Perceived Stress Scale. There were no differences between the two treatment groups at posttest and follow-up. But when compared with the control group, the treatment participants showed more significant benefits for coping stress, forgiveness and rumination.

Numerous studies were conducted to investigate the effect of meditation as stress management techniques on physiology of the body. Barnes, Bauza, and Treiber (2003) studied forty-five African-American adolescents aged 15 to 18 years with high normal systolic blood pressure. Persons were randomly assigned to a Transcendental Meditation group (n=25) and a health education control group (n=20) group. The meditation group performed meditation for 15 minute sessions once at home and once at school each day for 4 months. The control group received 15 minute sessions of health education at school each day for 4 months. The primary outcome measures were absenteeism, school rule infractions and suspension days during a four month pretest period prior as compared with the four month intervention period. After comparing the pretest and intervention periods, the meditation group exhibited a mean decrease of 6.4% absentee period compared to an increase of 4.8% in the control group. The results showed transcendental
meditation to be effective in a school setting to decrease absenteeism, rule infractions and suspensions rates in these African American adolescents.

Along with the stress management techniques, the effect of aromatherapy on stress reduction was also studied in adolescents. A two group cross over design study conducted by Seo (2008) showed a positive effect of aromatherapy on stress reduction in adolescents. The experimental group received aroma oil inhalation and the placebo treatment was a carrier of oil inhalation using an empty necklace. A decrease in stress levels at posttest was noted among the 36 female high school students as compared to the students who received the placebo treatment.

Stress management techniques like behavioral and progressive muscle relaxation showed similar effect on stress reduction. Rasid and Parish (1998) showed behavioral relaxation and progressive muscle relaxation helped lower anxiety among students. The study was conducted on 88 high school students who volunteered for participation in the project, though only 26 males and 29 females actually completed all the phases. Two treatment groups were formed, one group had 18 students for behavioral relaxation and the other group had 20 students for progressive relaxation. A control group had 17 students. The groups were given instructions on the relaxation techniques via videotapes in a large auditorium and were asked to imitate the various exercises demonstrated by the individual from the videotape. Both group 1 and 2 received the intervention for four 20 minute training sessions over two weeks. The students from the intervention and control groups were requested to complete the State-Trait Anxiety Inventory on the last day of the session. Findings showed that both the behavioral relaxation approach and the
progressive relaxation approach helped school students to reduce their anxiety as compared with the control group.

Cognitive therapy and applied relaxation methods were used as a treatment for generalized anxiety disorder (GAD) on 45 patients (15 men and 30 women) of a community mental health center. The mean duration of GAD was 8.8 years. The participants were first screened with a self-developed interview for the presence of GAD. One pre-treatment session was conducted to help patients’ acquaintance with self-monitoring of daily anxiety levels. Twelve weekly sessions of one hour each, then followed. After one year and six months, follow-up meetings were arranged. One group received cognitive therapy and the other received the applied relaxation method. The progressive relaxation was taught to the patients to help them relax quickly and apply these skills in their daily life. Patients were instructed to practice at least twice a week. Questionnaires were administered one week before treatment, after the 12th session (posttest), 4 weeks after the posttest, and at a 6-month follow-up. Data were analyzed for treatment effects through questionnaire subscale scores. The results showed that 55% of patients on cognitive therapy and 53% of patients on applied relaxation showed recovery from generalized anxiety disorder (Arntz, 2002).

Similarly, a study conducted by Paul, Elam, and Verhulst, (2006) supported the results reported by Arntz. The academic learning and achievement of students were shown to improve when students used diaphragmatic breathing. This technique was found to overcome stressful situations, increase concentration and provide a calming effect. The study was conducted to study the effect of Deep Breathing Meditation (DBM), had on exam stress reduction. This longitudinal study was conducted over a
period of 2 years. Sixty-four postbaccalurate premedical minority (53 women and 11 men) students at Southern Illinois University School of Medicine participated in the stress management technique on a regular basis. Two groups were formed during the academic years 2004-2005 (Group 1) and 2005-2006 (Group 2). Each group had 32 participants in each academic year. During each 10 month study period, the two groups were surveyed at three different times using an instrument developed by the author. The pretests and posttests were conducted before and after the deep breathing meditation technique was administered to the students using a Likert type scale to note changes in students’ perceived feelings and beliefs. Students were also taught about diaphragmatic deep breathing through written scripts followed by a 1 hour lecture on physiological effects of stress. Results demonstrated students in both groups reporting less exam fear, anxiety, nervousness, self doubt and an increase in concentration during exams.

McCraty, Atkinson, Tomasino, Goelitz and Mayrovitz (1999) argue that stress causes behavioral problems in young people creating physiological conditions that inhibit learning and potentially increase the risk of disease in later life. He studied the use of a stress management program in a middle school to establish healthier physiological response patterns. Thirty, seventh grade students participated in the program. Evening sessions for learning and practice of self management techniques were conducted through sixteen 1 hour long training sessions conducted over two weeks. Fifteen of these students volunteered to participate in cross–age mentoring program at a nearby elementary school for teaching emotional management tools and techniques. This course was called Heart Smarts. In the next year, a full elective course was provided to sixty new students in two separate classes. Thirty students from this group were randomly selected as an
experimental group and the rest as a control group. Measures were based upon the Achievement Inventory Measurement (AIM) to assess psychological and behavioral changes. In this study the Physiological Assessment Measure and student’s autonomic function was assessed by the analysis of heart rate variability (HRV). The interventions aimed to reinforce skills which would help students to deal effectively with mental and emotional stress while learning strategies were taught to reduce stress, sustain academic focus, improve communication skills and improve relationships with friends, family and teachers. The course also had a cross-age mentoring component. The AIM inventory was administered one week before and one week after the completion of the self management technique course. The HRV was assessed before, during and after a stressful interview where stress and recovery intervals were each analyzed separately. Results when compared with the base line study showed physiological, behavioral and physiological improvements in treatment students as compared to the control group. The self-management technique students were more motivated at school, focused, organized and developed leadership skills, reduced risky and harmful behaviors, and were able to effectively manage stress, anger and negative self-talk. Trained students also demonstrated increased HRV and more rhythmic, sine wave-like heart patterns during recovery which further confirmed the findings of the positive effect of this self management technique on the human body (McCraty, et.al 1999).

In contrast with the aforementioned studies, Waggoner, Cohen, Kohli, and Taylor (2002) reported stress management led to no difference between the levels of anxiety scores among students who received anxiety management versus an Attention control group. Participants were 26 second year dental students (14 male and 11 female).
Measures were a demographic form, the Visual Analog Scale (VAS) for anxiety, the Spielberger State-Trait Anxiety Inventory (STAI), and the COPE, a sixty-item Likert type questionnaire that evaluated an individual’s general coping method in response to stressors. Students were randomly assigned to two groups, either an Anxiety management or an Attention Control group. A sixty minute training session was received by both the groups in separate classes. After the session students had to perform the pediatric restoration procedure. Analysis showed no difference between the groups at posttest. Thus the results showed, stress management intervention had no role in decreasing the student anxiety and improving their attention span.

Stress is considered one of the most important factors that affect the health of people. Excessive stress causes changes like adrenal enlargement, gastrointestinal ulcers and thymicolymphatic shrinkage. Numerous researchers have demonstrated that excessive stress causes physiological and biochemical changes in the body. The coping response subsequently follows after a physiological stress response. Different people cope with stress in different ways. Either they adopt positive coping strategies (yoga, meditation, deep breathing, etc) or maladaptive coping strategies (alcohol/drug addiction, cigarette smoking, interpersonal withdrawal, etc). Stress management techniques in a class room setting have been effective in improving self esteem; motivating students to adopt positive coping strategies and behaviors, thereby reducing exam anxiety and stress. The current study is intended to examine the impact of stress management on learning in a classroom setting. It is assumed that the students experience high stress and anxiety which adversely affects their test performance.
Chapter 3

Methods

This chapter provides a description of the methods that were used to complete this study. It includes a statement of the hypothesis, population and sample selection, research design, a description of the stress management program used and data analysis. The purpose of the study was to test the impact of stress management on learning in a classroom setting.

Hypothesis

The following hypothesis was tested:

1. Graduate students receiving ten minutes of stress management before each class session will show better performance than the control group.

Population and Sample Selection

Participation in the stress management program was on a voluntary basis. The population from which the study subjects were drawn was Western Kentucky University students enrolled in PH 520 Biostatistics classes for fall 2009. This course was required for students seeking the MPH or MHA degree and is also taken by some graduate students from the departments of Nursing, Social Work, and Physical Education and Recreation. All student volunteers who performed the brief relaxation exercise and attended the administration of the pretest, midterm and final exams were included in the sample.
Research Design

The focus of the study was to examine the impact of stress management on learning in a classroom setting. The study was a quasi-experimental, cross over design and is displayed as follows:

<table>
<thead>
<tr>
<th>First half of the semester</th>
<th>Second half of the semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group1</td>
<td></td>
</tr>
<tr>
<td>O1</td>
<td>X</td>
</tr>
<tr>
<td>O3</td>
<td></td>
</tr>
</tbody>
</table>

Legend:

O1 – Pretest; O2 – Midterm Exam; O3 – Final Exam; X – Stress Management

Intervention

There were two sections of PH 520 offered during this term. The first, was from 2 p.m to 4:45 p.m each Wednesday of the 16 week semester (Group1; n=30). The second section was also taught on each Wednesday from 5:30 p.m to 8:15 p.m (Group2; n=10). The same instructor taught both classes. Lectures, handouts and the class text were the same in each class. Both classes were also in the same classroom.

The pretest was not used a part of the class grading process. Identical midterm and final exams were administered in both classes. During the first half of the fall semester, each class session in Group 1 was preceded by a ten minute stress management procedure. During the second half of the semester this procedure was discontinued in Group 1 and implemented in Group 2.
Instrumentation

The pretest (O1) was a 40 item multiple choice test developed by the class instructor. Twenty items covered material from the first half of the class and 20 items assessed material from the second half of the course. Each item has 1 correct answer and 3 distracters. Internal consistency reliability as assessed by Cronbach’s Alpha was 0.61 for the whole test. The Midterm Exam (O2) contained three sections: a) 41 multiple choice items (viz., 20 items of which were on the pretest (O1), b) two short essay questions, and c) three calculation problems. The Final Exam (O3) also had three components: a) 40 multiple choice items (i.e., the same 40 items as on the pretest), b) two short essay questions, and c) two calculation problems. For part three of the midterm and final exams (i.e., calculations) students were allowed to use the class text, their class notes, homework problems and a calculator. No personal digital assistance, cell phone or other hand held portable electrical devices were allowed. Parts One and Two of the midterm and final exams was closed book and closed note in format.

Description of stress management program

An outline of the Stress Management program (SMP) is located in Appendices A, B and C.

1. The students in both sections of the course were introduced to the study and asked to participate during the first class session. Informed consent forms were distributed at that time (Appendix A).

2. The pretest was administered during the first class meeting in both classes (i.e., groups).

3. The stress management technique was explained in Group 1 of the course
followed by a ten minute relaxation exercise. A detailed description of the technique is appended (see Appendix B and Appendix C).

4. The ten minute relaxation exercise was conducted at the beginning of each session of Group 1 of the course.

5. The midterm examination was administered as usual in both sections.

6. The stress management technique was introduced in Group 2 followed by a ten minute relaxation exercise and was no longer conducted in Group 1.

7. The ten minute relaxation exercise was conducted at the beginning of each session of Group 2

8. The final examination was administered as usual in both Groups.

Confidentiality

Subjects were assigned a unique ID for the purposes of this study. A code book matching the ID with students’ names was kept in a locked file cabinet in the office of the courses’ instructor. The instructor entered into the data base each student’s gender, nationality, and major department at Western Kentucky University. No other identifying information was included in the data set. The principal investigator was not able to identify any subjects in the data set. This project was approved by the Western Kentucky University Human Subjects Review Board on April 30th 2009.

Data Analysis

Data were collected from students who had completed the pretest, midterm and final exams. These data were collected from 30 students in Group 1 (n=0 missing data) and 10 students from Group 2 (missing data n=0) who were enrolled for the PH 520
biostatistics classes. Data were analyzed using this sample of convenience. The responses collected from the testing were coded for analysis by SPSS vs.17.

The data were analyzed using the statistical procedure analysis of covariance (ANCOVA). ANCOVA takes into account the relationship among the covariate, predictor and criterion variables. This consideration was important as the subject groups could not be randomly assigned to control or treatment groups, therefore, ANCOVA was utilized to minimize bias influences on the measured variables prior to treatment and to increase statistical power. The groups were compared at O2 (midterm exam) using O1 (Pretest) as the covariate. Group 1 served as the treatment group, while Group 2 was a no-treatment control group. At the end of the course the groups were compared on O3 (final exam), again, using the pretest (O1) as the covariate. For this comparison Group 2 was the treatment group, while Group 1 served as a no treatment control group.
Chapter 4

Results

Description of Study Sample

The study was conducted on a convenience sample composed of Western Kentucky University graduate students enrolled in PH 520 Biostatistics classes for fall 2009. There were two sections of PH 520 offered during this term, with the same instructor for both classes. Group 1 (n = 30) met each Wednesday from 2:00 p.m to 4:45 p.m of the 16 week semester. Group 2 (n = 10) also met each Wednesday but from 5:30 p.m to 8:15 p.m of the 16 week semester.

Table 1 shows the observed mean age for the sample by group. As can be seen from the table, Group 1 appears to be older than Group 2. However, an F-test showed no significant difference in age between Group 1 and Group 2 (F = 1.416 (1, 38), p = 0.2410).

Table 2 shows the observed distribution of gender within the sample. Respondents were largely female in both groups. A $X^2$ test for difference in gender between both (afternoon and evening) groups showed no significance ($X^2 = 0.147 (1)$, $p = 0.702$). However, the $X^2$ estimate is biased because 1 cell has an expected count less than 5.

Table 3 shows the observed distribution of domestic and international students in the groups. Group 1 is comprised mostly of domestic students and Group 2 of international students. A $X^2$ test showed no significant differences in the distribution of students by visa status ($X^2 = 1.212(1)$, $p = 0.271$). As with gender, one cell has an expected count of less than five cases, biasing the estimate.
Table 1

Mean age of respondents by group

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>30</td>
<td>29.8</td>
<td>7.2</td>
<td>22</td>
<td>50</td>
</tr>
<tr>
<td>Group 2</td>
<td>10</td>
<td>26.6</td>
<td>7.8</td>
<td>22</td>
<td>44</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>29.0</td>
<td>7.4</td>
<td>22</td>
<td>50</td>
</tr>
</tbody>
</table>
Table 2

Distribution of gender by group

<table>
<thead>
<tr>
<th></th>
<th>Gender</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>%</td>
<td>Female</td>
</tr>
<tr>
<td>Group 1</td>
<td>11</td>
<td>36.7</td>
<td>19</td>
</tr>
<tr>
<td>Group 2</td>
<td>3</td>
<td>30.0</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>35.0</td>
<td>26</td>
</tr>
</tbody>
</table>
Table 3

Distribution of international status by group

<table>
<thead>
<tr>
<th></th>
<th>International Status</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Domestic</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Group 1</td>
<td></td>
<td>18</td>
<td>60.0</td>
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<tr>
<td>Group 2</td>
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<td>4</td>
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<tr>
<td>Total</td>
<td></td>
<td>22</td>
<td>55.0</td>
</tr>
<tr>
<td></td>
<td>International</td>
<td>n</td>
<td>%</td>
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<td>Group 1</td>
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<td>12</td>
<td>40.0</td>
</tr>
<tr>
<td>Group 2</td>
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<td>6</td>
<td>60.0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>18</td>
<td>45.0</td>
</tr>
</tbody>
</table>
**Test of Hypothesis**

The following hypothesis was evaluated:

1. Graduate students receiving ten minutes of stress management before each class session will show better test performance than the control group.

To test this, an ANCOVA, using the Pretest scores for both groups as the covariate, and group membership as the predictor was conducted upon the midterm test scores (the dependent variable). Table 4 shows the test scores for both groups. The ANCOVA was significant ($F = 4.22 (1, 37); p = .047$). This suggests that there was significant improvement in knowledge in the group that received the treatment versus the control group that did not receive the treatment. Figure 1 shows this effect. As can be seen, the mean score on the pretest for Group 1 was actually below that of Group 2. However, following stress management treatment, their scores improved at a faster rate and surpassed those of Group 2.

A second ANCOVA was used to test if the withdrawal of stress management treatment from Group 1 and the addition of stress management treatment to Group 2 would result in higher test scores for Group 2 at the final exam. Table 4 shows the test scores for both groups in this second treatment condition. As before, there was a significant difference between the two groups, again controlling for their pretest scores ($F = 6.267 (1, 37); p = .017$). However, as can be seen from Figure 1, Group 1 still had higher test scores. In fact, examination of the table suggests that the gap between the midterm scores and the final scores between the two groups increased, suggesting that the learning was increasing at a faster rate for Group 1 in both conditions.
Table 4

Mean scores for pretest, midterm, and final by group

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>30</td>
<td>14.4</td>
<td>4.1</td>
<td>5.0</td>
<td>21.0</td>
</tr>
<tr>
<td>Midterm</td>
<td>30</td>
<td>39.1</td>
<td>3.6</td>
<td>33.0</td>
<td>47.0</td>
</tr>
<tr>
<td>Final</td>
<td>30</td>
<td>56.8</td>
<td>4.2</td>
<td>47.0</td>
<td>64.0</td>
</tr>
<tr>
<td>Group 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>10</td>
<td>17.6</td>
<td>4.3</td>
<td>11.0</td>
<td>24.0</td>
</tr>
<tr>
<td>Midterm</td>
<td>10</td>
<td>36.3</td>
<td>4.7</td>
<td>25.5</td>
<td>40.0</td>
</tr>
<tr>
<td>Final</td>
<td>10</td>
<td>52.2</td>
<td>7.3</td>
<td>34.0</td>
<td>61.0</td>
</tr>
</tbody>
</table>
Figure 1

Mean pretest, midterm, and final score by group (raw score converted to %)

<table>
<thead>
<tr>
<th>Percentage of total score</th>
<th>Pretest</th>
<th>Midterm</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Group 1
- Group 2
Chapter 5

The purpose of the study was to test the impact of stress management on learning in a classroom setting. The study was conducted on a convenience sample drawn from Western Kentucky University graduate students enrolled in PH 520 Biostatistics classes for fall 2009, aged 18 years to 50 years. There were two sections of PH 520 offered during this term, with the same instructor for both classes. Group 1 (n = 30) met each Wednesday from 2:00 p.m to 4:45 p.m of the 16 week semester. Group 2 (n = 10) also met each Wednesday but from 5:30 p.m to 8:15 p.m of the 16 week semester. The hypothesis tested was that graduate students receiving ten minutes of stress management before each class session would show better test performance than a control group.

Summary of Results

An ANCOVA was used to determine if there was a difference in knowledge gained between students who received the stress intervention versus those that did not. The first ANCOVA compared the midterm of Group 1 (i.e., treatment group) to the midterm of Group 2 (i.e., control group) using the pretest as the covariate. The mean of the treatment group was significantly higher than the control group. This suggested a potential treatment effect. The second ANCOVA also showed a difference in knowledge between Group 2 which received the treatment and Group 1 the control group. However, Group 1, now the control group still showed a higher mean test score.

Discussion

Bethune, (2008) reported excess stress as one of the leading cause adversely affecting the health of individuals. Most Americans reported physical and emotional symptoms such as fatigue, feelings of irritability or anger, insomnia, depression, lack of
interest or motivation, headaches, muscular tension, and weakness due to excessive stress. In addition to symptoms reported above, excess stress has been reported to cause chest pains, rapid heartbeats, overeating, dry mouth, increased frequency of colds, and lack of concentration or focus, memory problems or forgetfulness, anxiety and less gain in knowledge.

The observed make-up of students in Group 1 was comprised mostly of domestic students and Group 2 of international students. A $X^2$ test, however, showed no significant difference in the distribution of students by visa status. As with gender, one cell had an expected count of less than five cases, biasing the estimate. There was no difference in age between the two groups. The observed distribution of gender within the samples showed respondents were largely female in both groups but there was no difference in gender between both Group 1 and Group 2.

The first ANCOVA test supported the premise that a stress management intervention can lead to increased gains in knowledge. The results of this analysis indicated a difference with the implementation of the stress management intervention into the PH 520 Biostatistics class. The mean score on the pretest for Group 1 was actually below that of Group 2. However, following the stress management treatment, their scores improved at faster rate and surpassed those of Group 2 at the midterm. As noted in Chapter 3, this study included a cross over design component. Following the midterm exam the intervention was withdrawn from Group 1 and added to Group 2. Thus, this makes Group 1 the control group while Group 2 became the treatment group. Contrary to the expectation, when the two groups were again compared at the final exam, with the pretest as the covariate, Group 1 now the control group still out performed Group 2 the
treatment group. The explanations for this are unknowable at this time. This researcher posits five potential explanations: 1) Group 1 differed from Group2 in some way which made them more efficient learners, 2) students from Group 1 continued to do the relaxation procedures on their own during the 2\textsuperscript{nd} half of the course (Note: this is supported by anecdotal comments made to the researcher), 3) the class instructor was more effective teaching in the afternoon versus the evening, 4) that group 2 mastery during first half of the class may have given them a better foundation for learning material in the second half of the class, and 5) students may learn better in the afternoon than in the evening.

**Limitations**

The generalizability of the results of this research is limited by the use of a convenience sample of students at one university. Therefore, the results can only be generalized to the specific sample studied. The groups were also relatively small (n= 30 and n=10).

Another concern is that the respondents may not have been actually followed the instructions when performing the stress management technique to the best of their ability in the classroom setting as instructed. Individuals who practiced the stress management techniques outside the class setting may be at an advantage in coping with stress and performing better on the exam.

Other possible limitations were the duration of the study and the use of non-equivalent study groups. Group 1 had more (n=30) participants as compared to Group 2 (n= 10), and random assignment could not be used. The study intervention was conducted over a half course of one semester, essentially two months, which may not have been a
long enough intervention for improving course content retention. It may also be important to note that this was the first semester incorporating the stress management intervention with this researcher and the effectiveness may improve in future implementations.

**Conclusions**

Based on statistical analysis between the two groups in the study, a conclusion can be made:

1. The study did not give a clear answer if stress management was effective in improving learning.

**Implications**

The results of this study even though not clear cut; still hold some implications for stress management interventions. The findings emanating from this study suggest a possible need to provide adequate counseling services to those students in need, in order to assist them manage stress effectively. The findings may also imply that stress management skills such as deep breathing meditation should form part of this training.

**Recommendations**

Based on the results of the study the following suggestions are made for future study:

1. The WKU Health Service Department should perform a needs assessment to ascertain the demand by students for a stress management program;
2. A stress management program should be considered to be offered to students in the future thereby;
3. Systematic planning for evaluating the program outcomes should be implemented and should be conducted either through an ongoing monitoring system and/or another formal evaluation study;

4. The results suggest that the intervention should be carried for a longer duration of time in order to assess potential increases the significant gains in knowledge;

5. A meta-analysis should be performed critiquing existing research on the efficacy of stress management programs in classroom settings;

6. A replication of this study might include an initial assessment of student stress level at the pretest time.
Appendix A

In future correspondence, please refer to HS09-218, April 30, 2009

Pankaj Anandrao Mandale
c/o Dr. Thomas Nicholson
Public Health
WKU

Pankaj Anandrao Mandale:

Your research project, Impact of Stress Management of Learning in a Classroom Setting, was reviewed by the HSRB and it has been determined that risks to subjects are: (1) minimized and reasonable; and that (2) research procedures are consistent with a sound research design and do not expose the subjects to unnecessary risk. Reviewers determined that: (1) benefits to subjects are considered along with the importance of the topic and that outcomes are reasonable; (2) selection of subjects is equitable; and (3) the purposes of the research and the research setting is amenable to subjects' welfare and producing desired outcomes; that indications of coercion or prejudice are absent, and that participation is clearly voluntary.

1. In addition, the IRB found that you need to orient participants as follows: (1) signed informed consent is required; (2) Provision is made for collecting, using and storing data in a manner that protects the safety and privacy of the subjects and the confidentiality of the data. (3) Appropriate safeguards are included to protect the rights and welfare of the subjects.

This project is therefore approved at the Expedited Review Level until April 30, 2010.

2. Please note that the institution is not responsible for any actions regarding this protocol before approval. If you expand the project at a later date to use other instruments please re-apply. Copies of your request for human subjects review, your application, and this approval, are maintained in the Office of Sponsored Programs at the above address. Please report any changes to this approved protocol to this office. A Continuing Review protocol will be sent to you in the future to determine the status of the project. Also, please use the stamped form that accompanies this letter.

Sincerely,

Paul J. Mooney, M.S.T.M.
Compliance Manager
Office of Sponsored Programs
Western Kentucky University

cc: HS file number Mandale HS09-218

The Spirit Makes the Master
Office of Sponsored Programs | Western Kentucky University | 1906 College Heights Blvd. #11026 | Bowling Green, KY 42101-1026
phone: 270.745.4652 | fax: 270.745.4211 | e-mail: paul.mooney@wku.edu | web: http://ored.wku.edu/Research_Compliance/Human_Subjects/
Equal Education and Employment Opportunities • Printed and distributed by the WKU, 2010, MRU, 57, 375, 2010 • Hearing impaired Only: 270.745.3389
INFORMED CONSENT

Project Title: Impact of Stress Management on Learning in a Classroom Setting

Investigator: Pankaj Anandrao Mandale
Department of Public Health
Phone: 812-774-7697

Faculty Sponsor: Dr. Thomas Nicholson
Department of Public Health
Phone: 270-745-5855

This is a participation consent form for you to sign, to be eligible to participate in the project conducted through Western Kentucky University.

The details of the project including procedure, potential benefits and participation risks if any will be explained. You may ask about any doubts you may have. The basic information about the project is mentioned below.

Once you decide to participate in the project, please sign the last page of this form in my presence. You will be given a copy of this form to keep.

1. Nature and Purpose of the Project:

All students in PH 520 Biostatistics for fall 2009 are being asked to participate in the study. All students will take a pretest, which will not be a part of the class grading system. During half the semester (the first half for one class and the second half for the other) the first ten minutes of each class session will be devoted to a simple relaxation exercise aimed at reducing stress and promoting relaxation. The course midterm and final exams will be administered and graded as in any other semester.

The purpose of the study is to test the impact of stress management on learning in a classroom setting. The principal investigator will not have any access to the identity of the students whose scores are analyzed.

2. Explanation of Procedures:

A stress management technique is any skill that will help individuals to anticipate, prevent, manage and recover from the emotional and physiological wear and tear of daily life. There are numerous stress management procedures available but in this study we will be using a breathing relaxation technique. This technique is not a religious practice although some persons may find similar practices in meditation to be a spiritual practice within their own faith.

Let’s start with the shrugging of shoulders, first lift them up and then let them go completely limp. Wait for 20 seconds. (I will remind them when 20 seconds are over).

Now, slowly tilt your head back and give a squeeze in your back muscles of your neck and then relax them. We will relax for 20 seconds; I will tell you when 20 seconds will be over, till then relax.
Let's repeat the first step, and start with shrugging your shoulders. First lift them up and then let them go completely limp. Wait for 20 seconds, I will tell you when 20 seconds will be over, till then relax.

Now, slowly tilt your head back and give a squeeze in your back muscles of your neck and then relax them. We will relax for 20 seconds; I will tell you when 20 seconds will be over, till then relax.

Hang your arms by your sides and slightly lean back. Start taking a deep breath. When you feel like breathing out or exhaling, sit up. Next slightly and gently bend forward bringing your head and chest towards your knees. You can begin to exhale slowly. Take another breath slowly. Come back to your upright position.

We will repeat this exercise. As your arms are hanging by your side slightly lean back and take a deep breath. When you feel like breathing out or exhaling, sit up. Next slightly and slowly bend forward bringing your head and chest towards your knees. You can begin to exhale slowly. Take another breath slowly and come back to your upright position. Take a deep breath such that it will fill your chest and abdomen. Now pause, relax and exhale slowly and gently. You can now continue breathing normally for a while.

You will take three occasional deep breaths and then five normal breaths.

The second stage is the breathing exercise in which you will breathe full and relax. Then you will continue breathing in your own relaxed manner that is free and easy. Remember, you have to concentrate on the flow of breath, in and out preventing yourself from getting distracted. In case you do get diverted or your mind wanders, you have to return your attention to breathing. You will practice this technique with your eyes closed for eight minutes.

3. Discomfort and Risks:

The study procedures should result in no discomfort and involve no known risks.

4. Benefits:

Participants are expected to experience a temporary state of relaxation and may be able to apply the stress management techniques in the future. Whether they choose to participate in the study or not, they may also benefit from the pretest sensitizing them to the critical content areas for the subsequent exams.

5. Confidentiality:

Dr. Nicholson and Dr. White will enter all study data into a database on a secure website at Western Kentucky University. Students will be assigned a unique ID for the purposes of this study only. A code book matching the ID with students' names will be kept in a locked file cabinet in the office of Dr. Nicholson. No identifying information will be included in the data set. The principal investigator will not be able to identify any subjects in the data set.
6. Refusal/Withdrawal:

Refusal to participate in this study will have no effect on any future services you may be entitled to from the University. Anyone who agrees to participate in this study is free to withdraw from the study at any time with no penalty. If any student declines to participate, their data will not be included in the study. Any student who declines to participate in the study will be given the option of arriving ten minutes late for class without penalty or coming to class on time and ignoring the stress technique.

If you have any questions pertaining to the study, you may contact Dr. Thomas Nicholson, faculty sponsor for this project, at the following phone number 270-745-5855 or by email at thomas.nicholson@wku.edu

You understand also that it is not possible to identify all potential risks in an experimental procedure, and you believe that reasonable safeguards have been taken to minimize both the known and potential but unknown risks.

________________________________________  ______________________________________
Signature of Participant                          Date

________________________________________  ______________________________________
Witness                                           Date

I understand that while it is required to take the exams as part of the course work, I hereby agree to have my grades used as part of the studies.

________________________________________  ______________________________________
Signature of Participant                          Date

THE DATED APPROVAL ON THIS CONSENT FORM INDICATES THAT
THIS PROJECT HAS BEEN REVIEWED AND APPROVED BY
THE WESTERN KENTUCKY UNIVERSITY HUMAN SUBJECTS REVIEW BOARD
Paul Mooney, Compliance Coordinator
TELEPHONE: (270) 745-4652

HSRB APPLICATION # 01-2018
APPROVED 4/10/19 TO 4/13/19
EXEMPT
DATE APPROVED 4/13/19
Appendix B

First Session

Introduction and Exercise

I am conducting a study of the impact of stress management on learning in the classroom setting. I invite you to be participants in the study on stress management.

I will introduce you to stress management relaxation techniques described in Stress Management, A Comprehensive Handbook of Techniques and Strategies by clinical psychologist Jonathan C. Smith, PhD, the founder and director of Roosevelt University Stress Institute.

A stress management technique can be defined as a skill that helps an individual to prevent, manage and cope with every day stress. There are different methods of stress management like aroma therapy, Ayurvedic therapy, prayer, Yoga, or hypnosis. Our study will be using the breathing method, a relaxation technique that will help you to deal with stress. This stress management technique will be conducted for ten minutes before every class session.

Let’s start with the shrugging of shoulders, first lift them up and then let them go completely limp. Wait for 20 seconds. (I will remind them when 20 seconds are over).

Now, slowly tilt your head back and give a squeeze in your back muscles of your neck and then relax them. We will relax for 20 seconds; I will tell you when 20 seconds will be over, till then relax.

Let’s repeat the first step, and start with shrugging your shoulders. First lift them up and then let them go completely limp. Wait for 20 seconds, I will tell you when 20 seconds will be over, till then relax.
Now, slowly tilt your head back and give a squeeze in your back muscles of your neck and then relax them. We will relax for 20 seconds; I will tell you when 20 seconds will be over, till then relax.

Hang your arms by your sides and slightly lean back. Start taking a deep breath. When you feel like breathing out or exhaling, sit up. Next slightly and gently bend forward bringing your head and chest towards your knees. You can begin to exhale slowly. Take another breath slowly. Come back to your upright position.

We will repeat this exercise. As your arms are hanging by your side slightly lean back and take a deep breath. When you feel like breathing out or exhaling, sit up. Next slightly and slowly bend forward bringing your head and chest towards your knees. You can begin to exhale slowly. Take another breath slowly and come back to your upright position. Take a deep breath such that it will fill your chest and abdomen. Now pause, relax and exhale slowly and gently. You can now continue breathing normally for a while. You will take three occasional deep breaths and then five normal breaths.

The second stage is the breathing exercise in which you will breathe full and relax. Then you will continue breathing in your own relaxed manner that is free and easy. Remember, you have to concentrate on the flow of breath, in and out preventing yourself from getting distracted. In case you do get diverted or your mind wanders, you have to return your attention to breathing. You will practice this technique with your eyes closed for eight minutes.
Now, slowly tilt your head back and give a squeeze in your back muscles of your neck and then relax them. We will relax for 20 seconds; I will tell you when 20 seconds will be over, till then relax.

Hang your arms by your sides and slightly lean back. Start taking a deep breath. When you feel like breathing out or exhaling, sit up. Next slightly and gently bend forward bringing your head and chest towards your knees. You can begin to exhale slowly. Take another breath slowly. Come back to your upright position.

We will repeat this exercise. As your arms are hanging by your side slightly lean back and take a deep breath. When you feel like breathing out or exhaling, sit up. Next slightly and slowly bend forward bringing your head and chest towards your knees. You can begin to exhale slowly. Take another breath slowly and come back to your upright position. Take a deep breath such that it will fill your chest and abdomen. Now pause, relax and exhale slowly and gently. You can now continue breathing normally for a while. You will take three occasional deep breaths and then five normal breaths.

The second stage is the breathing exercise in which you will breathe full and relax. Then you will continue breathing in your own relaxed manner that is free and easy. Remember, you have to concentrate on the flow of breath, in and out preventing yourself from getting distracted. In case you do get diverted or your mind wanders, you have to return your attention to breathing. You will practice this technique with your eyes closed for eight minutes.
Appendix C

Follow-up Sessions

Hello friends. Good evening. We will start our relaxation exercise. If anyone has a question about our procedure you are free to ask. (If they have doubts, they will be cleared up and then the exercise will be started.)

As all of you are seated, we will start the exercise. Are all of you ready?

Let’s start with the shrugging of shoulders, first lift them up and then let them go completely limp. Wait for 20 seconds. (I will remind them when 20 seconds are over).

Now, slowly tilt your head back and give a squeeze in your back muscles of your neck and then relax them. We will relax for 20 seconds; I will tell you when 20 seconds will be over, till then relax.

Let’s repeat the first step, and start with shrugging your shoulders. First lift them up and then let them go completely limp. Wait for 20 seconds, I will tell you when 20 seconds will be over, till then relax.

Now, slowly tilt your head back and give a squeeze in your back muscles of your neck and then relax them. We will relax for 20 seconds; I will tell you when 20 seconds will be over, till then relax.

Hang your arms by your sides and slightly lean back. Start taking a deep breath. When you feel like breathing out or exhaling, sit up. Next slightly and gently bend forward bringing your head and chest towards your knees. You can begin to exhale slowly. Take another breath slowly. Come back to your upright position.

We will repeat this exercise. As your arms are hanging by your side slightly lean back and take a deep breath. . When you feel like breathing out or exhaling, sit up. Next
slightly and slowly bend forward bringing your head and chest towards your knees. You can begin to exhale slowly. Take another breath slowly and come back to your upright position. Take a deep breath such that it will fill your chest and abdomen. Now pause, relax and exhale slowly and gently. You can now continue breathing normally for a while.

You will take three occasional deep breaths and then five normal breaths.

Now, close your eyes relax and breathe free and easy. Try to attend the flow of your breath in and out. If your mind wanders try to return your attention to breathing. We will continue this for 8 minutes. I will remind you after 8 minutes, and then you can open your eyes.

(After 8 minutes) Please open your eyes…..

Thank you, friends, for your participation. Dr. Nicholson will continue with the regular class shortly. Bye!
References


http://www.springerlink.com/content/gq75t875m86q0158/fulltext.pdf
