Measuring Physiological Variables in Student Pharmacists after Conducting Relaxation and Non-Relaxation Techniques

Heather Kelley  
*Southwestern Oklahoma State University*

Emma Leffler  
*Southwestern Oklahoma State University*

Nicholas Lockyear  
*Southwestern Oklahoma State University*

Angelica Lajaunie  
*Southwestern Oklahoma State University*

Aminatou Mouliom  
*Southwestern Oklahoma State University*

*See next page for additional authors*

Abstract

Follow this and additional works at: [https://dc.swosu.edu/cop_ps_student](https://dc.swosu.edu/cop_ps_student)

Recommended Citation

Kelley, Heather; Leffler, Emma; Lockyear, Nicholas; Lajaunie, Angelica; Mouliom, Aminatou; Burgess, Gwen; Burgess, Melinda; and Appeddu, Lisa, "Measuring Physiological Variables in Student Pharmacists after Conducting Relaxation and Non-Relaxation Techniques" (2016). *Student Research*. 1.  
[https://dc.swosu.edu/cop_ps_student/1](https://dc.swosu.edu/cop_ps_student/1)

This Poster is brought to you for free and open access by the Pharmaceutical Science at SWOSU Digital Commons. It has been accepted for inclusion in Student Research by an authorized administrator of SWOSU Digital Commons. An ADA compliant document is available upon request. For more information, please contact phillip.fitzsimmons@swosu.edu.
Authors
Heather Kelley, Emma Leffler, Nicholas Lockyear, Angelica Lajaunie, Aminatou Mouliom, Gwen Burgess, Melinda Burgess, and Lisa Appeddu

This poster is available at SWOSU Digital Commons: https://dc.swosu.edu/cop_ps_student/1
Measuring Physiological Variables in Student Pharmacists after Conducting Relaxation and Non-Relaxation Techniques

Heather Kelley, Pharm.D. Candidate, Southwestern Oklahoma State University, Weatherford, OK
Emma Leffler, Nicholas Lockyear, Angelica Lajaunie, Aminatou Mouliom, and Gwen Burgess – SWOSU Students
Melinda Burgess, Ph.D., Professor of Psychology – SWOSU College of Professional & Graduate Studies
Lisa Appeddu, Ph.D., Associate Professor of Physiology – SWOSU College of Pharmacy

Background
- The positive effects of conducting relaxation techniques on reducing stress, increasing focus, and improving mindfulness is well-documented via self-reported responses to survey questions1,2,3.
- Recently, Tang, Holzel, and Pozner (2015) reviewed meditation studies which used the hormone cortisol to indicate the physiological reduction of stress4.
- This study investigates the acute impact of relaxation techniques on student physiological measures to gain another, more objective view of their effects.

Objectives
- **Primary outcomes**: To compare physiological measures (body temperature, muscle tension, respiration rate, and heart rate) between intervention (relaxation) and control (non-relaxation) techniques.
- **Secondary outcomes**: To compare the effect of each treatment on these measures.

Methods
- **Population**: 86 Student Pharmacists were recruited via convenience sampling from P1, P2, and P3 years from the SWOSU College of Pharmacy.
- **Subjects were randomly assigned to and taught one of the following techniques**:
  - Three relaxation interventions (n = 48)
    - Body Scan Meditation (n = 16) – Systematically relaxing muscles
    - Mindfulness Meditation (n = 16) – Focusing on the sound of a bell
    - 4 x 4 Meditation (n = 16) – Counting breaths
  - Two non-relaxation controls (n = 38);
    - Power Posing2 (n = 19) – Holding an open pose
    - Mental Stimulation (n = 19) – Playing Word Streak App
- **Measures recorded utilizing Vernier® LoggerPro 3.10.1 and SP02 Review v1.5 software while conducting techniques**:
  - **Respiration Rate** – Secured respiration belt around diaphragm, and then inflated belt to increase pressure ~ 5 mmHg.
  - **Body Temperature** – Taped probe onto forehead.
  - **Muscle Tension** – Stuck electromyography (EMG) electrodes on dominant arm (ground), cheekbone, and jawbone.
  - **Heart Rate** – Put monitor on index finger of opposite arm.

Preliminary Analysis:
- The recording of each measure was manually evaluated as follows:
  - Selected a representative time period (i.e., between 60 seconds after recording started and 60 seconds before student had obviously taken off equipment)
  - Recorded resulting descriptive statistics (i.e., mean, median, standard deviation, and minimum and maximum values)
  - Evaluated overall trend by recording linear fit (i.e., slope) of the data
- Preliminary analysis of physiological measures included t-tests and simple ANOVA to compare mean data responses (IBM SPSS Advanced Statistics, version 21).
- We expect relaxation techniques to lower body temperature, respiration rate, and muscle tension more than controls.

Results
- **Primary outcomes**: Maximum muscle tension in the face was found to be lower (P < 0.05) in subjects while conducting relaxation versus non-relaxation techniques in comparing the mean maximum EMG values (see Figure 1 below).
- **Secondary outcomes**:
  - **Respiration Rate** – Average respiration rate of at least one technique was different (P < 0.05) in evaluating mean and median respiration rates. Post-hoc results suggest Word Streak increased respiration rate, whereas 4x4 meditation reduced it (see Figure 2 for median respiration rate results).
  - **Body Temperature and Muscle Tension** – No differences (P > 0.05) in physiological measures among techniques were detected.
  - **Heart Rate**: Time did not permit analysis of this variable.

Challenges & Future Directions
- The following are challenges in conducting physiological measures on human subjects:
  - A few subjects continued to chew gum after salivary collections.
  - Default setting of Vernier software to ECG accidentally preventing recording of EMG.
  - Medical tape did not always stick, causing the body temperature probe or EMG electrodes to detach during recording.
  - Medical tape did not stick to beards, requiring EMG measures to be taken from different facial positions.
  - Respiration belt did not fit all students – either being too small or too large.
  - Minimum and maximum values for respiration rate were not measured yet.
  - Overall, it took a lot of time and labor to individually collect measures on 86 students, as well as to manually evaluate each recorded measure for each student.
  - Aside from heart rate and remaining respiratory measures, pre- and post-technique salivary samples need to be analyzed for cortisol, testosterone, and alpha-amylase.
  - Correlations will be evaluated between physiological and survey measures in studying the impact of relaxation and non-relaxation techniques on student well-being.

References