Benefits of Posture Training using Biofeedback

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Purpose

- To present the background and development of the Upright™ posture trainer
- To discuss the usage of the Upright™ posture trainer in different training programs, populations, and settings
- To present research using the Upright™ posture trainer in healthy populations
- To discuss how to overcome the challenges the Upright™ posture trainer presents
Importance of Posture
Development of the Upright™
Training Programs
## Upright Training Programs

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BMI 1 = normal = 18.5 < w < 24.9  
BMI 2 = w < 18.5 & w > 24.9

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Self-Esteem Study
Hypotheses

**Spine Angles**
- There will be a significant increase in the kyphosis index in the experimental group but not in the control group.
- There will be a significant decrease in kyphosis angle in the experimental group but not in the control group.
- There will be a decrease in the deviation from baseline of zero on the thoracic spine angles during seated computer use in the experimental group but not in the control group.

**Self-Esteem**
- There will be an increase in self-esteem and confidence in the experimental group but not in the control group.

**Muscle Fitness**
- There will be a significant increase in muscular endurance in the lower back paraspinals from pre- to post-intervention in the experimental group but not the control group.
- There will be a significant decrease in muscular fatigue in the lower back paraspinals from pre- to post-intervention in the experimental group but not the control group.
Participants

- 52 healthy young adults
- Texas Tech University
Inclusion Criteria

- Individuals with no clinically diagnosed depression or other mood disorders
- Individuals who do not use corrective equipment
- Individuals with a Body Mass Index (BMI) of less than 30
- Individuals who have not gone through professional medical treatment to correct or improve posture
- Individuals with no previous or recent (less than 6 months) muscle injury
- Individuals who are within 18-35 years of age
Enrollment

Assessed for eligibility (n=55)

- Excluded (n=3)
  - Not meeting inclusion criteria (n=1)
  - Declined to participate (n=2)

Randomized (n=52)

Allocation

Allocated to intervention (n=24)
- Received allocated intervention (n=24)
- Did not receive allocated intervention (give reasons) (n=0)

Allocated to Control (n=28)
- Received allocated intervention (n=28)
- Did not receive allocated intervention (give reasons) (n=0)

Follow-Up

Lost to follow-up (give reasons) (n=7)

Discontinued intervention (give reasons) (n=7)
- Forgot to Train (n=6)
- Technical Difficulties (n=1)

Lost to follow-up (give reasons) (n=5)

Discontinued intervention (give reasons) (n=5)
- Did not return for post-test (n=5)

Analysis

Analysed (n=24)
- Excluded from analysis (give reasons) (n=0)

Analysed (n=18)
- Excluded from analysis (give reasons) (n=0)
Purpose of the Research

- The purpose of this study is to analyze the effect of The Upright training device on:
  - (a) standing posture;
  - (b) seated posture while typing on a computer;
  - (c) self-esteem and confidence;
  - (d) muscle force; and
  - (e) muscle fatigue.
Significance of the research

- Technology is an increasing occurrence in day to day life and people are more at risk to develop neck and back pain at a younger age.
- Posture improvements while using technology may help prevent these problems and improve daily comfort.
- Additionally, people who make the effort to improve their posture and become more confident and increase self-awareness may improve their overall well-being.
Delimitations

- Conclusions of the study are generalized to individuals who have not been diagnosed or treated for postural impairments.
- Conclusions of the study are generalized self-reported individuals with self-reported diagnosed depression or other mood disorders.
- Conclusions of the study are only generalized to young adults (ages 18-35).
Procedures

- Participants completed pre-testing on days one and two
  - Day one consisted of the consent form, medical questionnaire, participant identification form, 2 self-esteem surveys, and familiarization testing
    - On this day, they were randomly assigned to the experimental group or the control group
  - Day two consisted of the spinal angle measurements (flexicurve and bubble inclinometer) and the modified Biering-Sorenson test.
Measurements
Fig. 1. Angle for measuring thoracic and lumbar spine angles.

Modified Biering-Sorenson Test

https://youtu.be/dRXR1h-KQog
MicroFET-2
Results
Posture Variables

Seated Thoracic Spinal Angle

- Experimental
- Control

*p<0.05

Text neck can lead to serious neck injury over time

Poking your chin out will force you to straighten your back.
Self-Esteem

Texas Social Behavior Inventory

Judgmental Self-Doubt Scale

Pre Post

Scores

Experimental Control

Pre Post

Scores

Experimental Control
Posture Variables

### Standing Thoracic Spinal Angle

- **Pre**
  - Experimental: 34.00°
  - Control: 8.40°

- **Post**
  - Experimental: 31.00°
  - Control: 7.60°

### Index of Kyphosis

- **Pre**
  - Experimental: 8.60°
  - Control: 7.00°

- **Post**
  - Experimental: 8.20°
  - Control: 7.40°
Muscle Characteristics
Muscle Characteristics

Left L5 Median Frequency

Left L5 Mean Frequency
Muscle Characteristics

**Right L5 Median Frequency**

- **Experimental**
  - Pre: 62
  - Post: 71

- **Control**
  - Pre: 65
  - Post: 68

**Right L5 Mean Frequency**

- **Experimental**
  - Pre: 62
  - Post: 138

- **Control**
  - Pre: 66
  - Post: 130
Muscle Characteristics

**Left L5 Amplitude**

- **Experimental**
- **Control**

**Right L5 Amplitude**

- **Experimental**
- **Control**
What did we learn?
Challenges
Limitations

- The findings are dependent on whether participants will adhere to the training schedule set by the upright training program.
- The findings may only be generalized to college-aged individuals of 18-25 years of age.
- Participants could assume an abnormally perfect posture.
- Participants may assume a better posture than normal in the presence of the researchers.
Challenges

- Technical Difficulties
  - Bluetooth
  - Updates
- Motivation
- Coaching
Clinical Populations/Settings

- Patient Response
- Prescribing
- Challenges
Take Home Message

Awareness
Questions?