Determining Risk Factors for Neck Pain Development due to Smartphone Use Using the Pain Pressure Threshold Test

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BACKGROUND

- Smart phone use has become increasingly popular recently, especially in the young adult population.
- Neck flexion, the most common position when using a smartphone, has previously been linked to neck pain development.

RESEARCH QUESTION: Is thirty minutes of smartphone use linked to neck pain development?

HYPOTHESIS: Young adults who have never received treatment for neck pain will develop neck pain during smartphone use and will have different pain pressure thresholds after using a smartphone for thirty minutes.

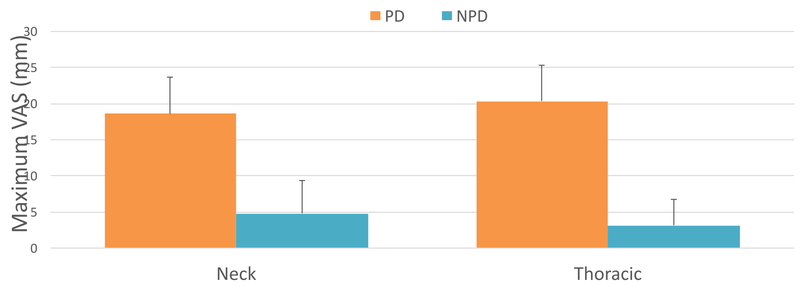
METHODS

- 43 participants (17 males, 26 females)
- 100 mm Visual Analog Scale (VAS) used to assess participant's current state of pain. A pain developer (PD) had an increase greater than 11 mm in their VAS during the smartphone use
- Pain Pressure Threshold (PPT) measured using digital algometer on 6 bilateral landmarks (tibialis anterior, splenius capitis, splenius cervicis, upper trapezius, levator scapulae, and sternocleinomastoid) before and after 30 minutes of smartphone use

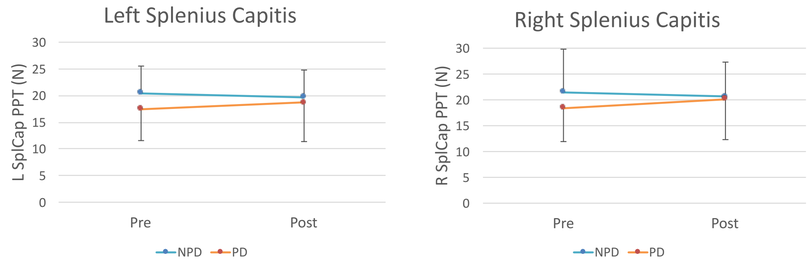
PPT of Tibialis Anterior (Left) and Upper Trap (Right)

- Two-way repeated measures ANOVA with one between factor (pain or non-pain developer) and a within factor of time (before and after smartphone use) for statistical analysis.

RESULTS



Maximum VAS scores for PD and NPD in the neck and thoracic regions



PPT values for the Right and Left Splenius Capitis in PD and NPD before and after smartphone use

- 24 PDs and 19 NPDs
- Significant difference found between pain groups for the maximum Visual Analog Scale scores (Left) of the neck ($p<.001$) and thoracic ($p<.001$) regions
- Pain developers demonstrated higher maximum VAS scores than non-pain developers in both regions, differing by approximately 13.78 mm for the neck and 17.18 mm for the thoracic region

- Interaction between time and pain group was found for the pain pressure threshold (right) of the right splenius capitis ($p=.0145$) and left splenius capitis ($p=.0096$)
- PPT was significantly different for PDs in the right ($p=.0188$) and left ($p=.0179$) splenius capitus before and after smartphone use
- No influence of smartphone use on the PPT of non-PDs or the other muscles tested

CONCLUSIONS

- More individuals developed pain in the neck or thoracic regions than did not develop pain, and the pain developers had a higher maximum VAS score than the non-pain developers
- Increase in PPT after 30 minutes of smartphone use could be due to a possible trigger point release in the splenius capitis
- PPT is likely not the best clinical to assess neck pain, and different clinical testing methods should be used in future neck pain studies

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