**Lumbar Spine Reposition Sense: The Effect Of A ‘Slouched’ Posture**

**(Summary)**

Low back pain is considered to be a major clinical and public health problem according to a study. It is described as having reached epidemic proportions in most western industrialized countries with 60%-80% of all adults sufferings from low back pain at some point during their lives.The aim of this study was to evaluate the effect of prolonged ‘slouched’ posture on lumbar spine reposition sense compared to immediate reposition sense in asymptomatic subjects. It was hypothesized that the accuracy of lumbar spine repositioning would be reduced in those subjects that sat in a prolonged ‘slouched’ posture compared to those that did not.

There are methods to study the Lumbar spine reposition sense by using Design, Sample, Inclusion and Exclusion criteria, Measurement, Procedure, Reliability and Data Analysis.

The above research shows the results with flexible electrogoniometer measurements with good reliability and proper and different data and measures with calculations and design methods. The results of this study indicated that lumbar spine reposition sense following prolonged ‘slouched’ posture significantly different to immediate lumbar spine reposition sense.

Furthermore on reaching the conclusion we get to know that this study has shown that time spent in a ‘slouched’ lumbar spine posture challenges reposition sense. Finding supports the use of postural education in promoting spinal proprioception. Also, the electrogoniometer shows potential for use in clinical practise. Further research could provide information on slouched postures as commonly adopted day to day postures and the proposed changes in proprioceptive muscle activity could be confirmed with fine wire electrodes. The significance of the results for the prevention of low back pain is to some degree dependent on establishing a direct link between reposition sense loss and low back pain.

**Commercial Postural Devices: A Review**

**(Summary)**

The word posture is derived from french origin posture meaning the deposition of parts, in particular, the carriage and position of limbs or the body as a whole, indicating a certain feeling, pose, attitude or quality. There are various mechanical and neurological pathologies which result in disorders of posture.

Wearables are devices worn on the human body and are able to measure various health parameters, such as physical activity, expenditure of energy and gait. With the advancement of technology, the general population are now spending more hours craning our necks and slouching over smartphones, tablets and computers, etcetera. Bodily posture is representative of physical and mental health. Poor posture can lead to spinal complications and the same can be said vice versa. As the standard of living increases, there is an increase in consumerism and the expectation to maintain such a lifestyle even in the aging population. Therefore, many are able to afford small luxuries in life, such as a piece of technology that could potentially improve their health in the long run. Wearable technology is a promising alternative to laboratory systems for movement and posture analysis.

Principles of Wearable Devices in Posture Analysis has Microelectromechanical Systems (MEMS), which include inertial sensors such as accelerometers, gyroscopes and magnetometers are utilised in wearables. The most common underlying technology in wearables is the inertial measurement units (IMU), which typically consists of accelerometers and gyroscopes, and may include magnetometers. Components of IMU or Inertial Measurement Unit are featured as:

1. Accelerometer - which measures proper acceleration: Gravitational force (static) and sensor movement (dynamic); and at least 1-D accelerometer.

2. Gyroscope - Measures angular velocity and requires at least 1-D gyroscope.

3. Magnetometer - Measures all magnetic fields and requirements are optional.

Inertial Measurement Units in the form of a combination of an accelerometer, gyroscope and magnetometer, allows measurement of rotational angle about a joint by identifying the main axis of motion. It is assumed that two segments are connected by a joint with one rotational degree of freedom (DoF). DoF in IMUs has following components:

DoF - 9 with 3-D accelerometer, 3-D gyroscope and 3-D magnetometer (Most Accurate);

DoF - 6 with 3-D accelerometer and 3-D gyroscope (Less accurate than DoF - 9);

DoF - 5 with 3-D accelerometer and 2-D gyroscope (Less accurate than DoF - 6);

DoF - 4 with 3-D accelerometer and 1-D gyroscope (Less accurate than DoF - 5).

Further, wearable devices deals with the Sensor placements, Validity and Reliability of wearable devices for postural analysis, Biomechanical studies in postural analysis, Methodology and it’s Device market reviews and Commercially Available Postural Devices.

The most commercially wearable postural devices available are: Upright Go, Lumo Back, Lumo Lift, Zikto Walk, Prana, Jins Meme, Alex+, Nadi X and Sense-U.

Coming to the Clinical Applicability these wearable devices deal with the - Prevention of spinal conditions, Monitoring of spinal conditions, Treating spinal conditions and other uses of posture wearables in Healthcare. These wearables are useful in Fall Risk Assessment too such as Fall Detection, Parkinson’s disease, Multiple sclerosis, Stroke etc.

The use of commercial wearables for healthcare has its own pros and cons. In conclusion, the application of this wearable technology in healthcare is in its infancy, and how it may best serve medicine remains unclear.

**Thoracic Kyphosis In Shoulder Pain**

**(Summary)**

Enormous Thoracic Kyphosis is considered a predisposing factor for shoulder pain, though there is uncertainty about the nature of the relationship between shoulder pain and thoracic spine posture. The aim of this complete research and study was to investigate the relationship between shoulder pain and thoracic kyphosis, along with shoulder ROM i.e. range of motion and function.

However, when it comes to the methods, after reviewing and independently searching eight electronic databases and identifying relevant studies by applying eligibility criteria. Sources of bias were assessed independently by reviewers using a previously validated tool. Data were synthesised using a level of evidence approach.

Following methods afterwards come results which show the study, research and results of ten different studies which were included. Among these ten studies, four studies were rated as low risk of bias, three at moderate risk of bias and three at high risk of bias. There is a moderate level of evidence of no significant difference in thoracic kyphosis between groups with and without shoulder pain. One study at high risk of bias demonstrated significantly greater thoracic kyphosis in people with or without shoulder pain. There is a strong level of evidence that maximum shoulder range of motion is greater in erect postures as compared to slouched postures, in people with or without shoulder pain.

From all of the above points and discussion we reach a summarized conclusion that Thoracic Kyphosis may be not an important contributor to the development of shoulder pain. While there is evidence that reducing thoracic kyphosis facilitates greater shoulder range of motion, this is based on single-session studies whose long term clinical relevance is unclear. Higher quality research is warranted to fully explore the role of thoracic posture in shoulder pain.

**CODE**

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