

Implementing Postural Neurology for Maximum Impact

Postural Neurology Research References

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Forward Head Posture Among School Aged Children

Approximately 37% of children have moderate forward head posture and approximately 36% of children were found to have severe forward head posture. The study showed that forward head posture is developing at early stage in the school going children and it has the potential of altering cervical spine biomechanics. Early screening is much essential aspect to prevent Forward head posture.

- Chandoliya, H., Chorsiya, V., & Kaushik, D. (2021). Prevalence and Levels of Forward Head Posture among School Going Children.

Musculoskeletal Pain while Working from Home in Abnormal Postures

Work from home conditions continued to result in high levels of body discomfort (49% neck and head, 45% low back, and 62% upper back and shoulders having moderate to severe pain).

- Kotowski, S. E., Davis, K. G., & Gerding, T. (2022). Almost a year in: Virtual offices remained an ergonomic trouble spot. *Work*, (Preprint), 1-8.

Tech Neck Posture

As the head tilts forward at varying degrees, the amount of pressure on the cervical spine multiplies.

- Hansraj, K. K. (2014). Assessment of stresses in the cervical spine caused by posture and position of the head. *Surg Technol Int*, 25(25), 277-9.

Forward Head Posture and Blood Flow to the Brain

Correcting the loss of cervical lordosis increased cerebral artery parameters, indicating an immediate increase in blood flow in the brain.

- Katz, E. A., Katz, S. B., Fedorchuk, C. A., Lightstone, D. F., Banach, C. J., & Podoll, J. D. (2019). Increase in cerebral blood flow indicated by increased cerebral arterial area and pixel intensity on brain magnetic resonance angiogram following correction of cervical lordosis. *Brain circulation*, 5(1), 19.

Respiratory Function

Forward head posture is associated with morphological changes of the thorax causing decreased respiratory function.

- Koseki, T., Kakizaki, F., Hayashi, S., Nishida, N., & Itoh, M. (2019). Effect of forward head posture on thoracic shape and respiratory function. *Journal of physical therapy science*, 31(1), 63-68.

Forward Head Posture and Proprioception

Forward head posture has a negative effect on the muscle spindle activity involved in proprioception, resulting in cervical repositioning errors and deficits of dynamic balance ability.

- Ha, S. Y., & Sung, Y. H. (2020). A temporary forward head posture decreases function of cervical proprioception. *Journal of exercise rehabilitation*, 16(2), 168.

Joint Position Error

The results showed that forward head posture, regardless of pain, increases the amount of joint position error. As a result, mechanical stability and normal kinematics are reduced.

- Raoofi, Z., Sarrafzadeh, J., Emrani, A., & Ghorbanpour, A. (2019). Interaction between proprioception, forward head posture and neck pain in adult women. *Function and Disability Journal*, 2(1), 90-99.

Smartphones, Cervical Stress, and Depression

Heavy smartphone use may produce considerable stresses on the cervical spine, thus changing the cervical curve and pain threshold of the muscles around the neck. Smartphones could also cause negative effects on a person's psychological status, such as depression.

- Park, J., Kim, J., Kim, J., Kim, K., Kim, N., Choi, I., ... & Yim, J. (2015). The effects of heavy smartphone use on the cervical angle, pain threshold of neck muscles and depression. *Advanced Science and Technology Letters*, 91(3), 12-17.

Posture and Cognitive Function

Mobility and upright posture is associated with aspects of cognition including memory. These results provide the first evidence for a link between postural alignment and cognitive functioning in healthy older adults.

- Cohen, R. G., Vasavada, A. N., Wiest, M. M., & Schmitter-Edgecombe, M. (2016). Mobility and upright posture are associated with different aspects of cognition in older adults. *Frontiers in aging neuroscience*, 8, 257.

Back Pain and Gray Matter in the Brain

Patients presenting with chronic low back pain demonstrated 10–20 times more loss of gray matter on MRI than the control group.

- Apkarian, A. V., Sosa, Y., Sonty, S., Levy, R. M., Harden, R. N., Parrish, T. B., & Gitelman, D. R. (2004). Chronic back pain is associated with decreased prefrontal and thalamic gray matter density. *Journal of neuroscience*, 24(46), 10410-10415.

Neuromotor Alterations and Postural Stabilizations

Research demonstrates that people with low back pain have different postural stabilization patterns and move differently. Neuromotor alterations to pain were noted.

- Jacobs, J. V., Henry, S. M., Jones, S. L., Hitt, J. R., & Bunn, J. Y. (2011). A history of low back pain associates with altered electromyographic activation patterns in response to perturbations of standing balance. *Journal of neurophysiology*, 106(5), 2506-2514.

Gait and Dementia

"Poor gait performance predicts dementia"...poor gait performance is a stronger predictor of non-Alzheimer's dementias.

- Beauchet, O., Annweiler, C., Callisaya, M. L., De Cock, A. M., Helbostad, J. L., Kressig, R. W., ... & Allali, G. (2016). Poor gait performance and prediction of dementia: results from a meta-analysis. *Journal of the American Medical Directors Association*, 17(6), 482-490.

Parkinson's Disease, Depression, and Posture

“Patients with Parkinson's Disease (PD) and depression showed increased flexion at pelvis level, which caused the trunk to tilt anteriorly. In addition, the severity of depression was correlated with the degree of anterior tilting of the head and trunk. These findings suggest that stooped posture, especially from the pelvis level, could be a marker of depression in patients with PD.”

- Kim, Y., Cheon, S. M., Youm, C., Son, M., & Kim, J. W. (2018). Depression and posture in patients with Parkinson's disease. *Gait & posture*, 61, 81-85.

Forward Head Posture and Vestibular Deficits

Compelling evidence exists that links forward head posture with vestibular deficits, increased fall risk, and impaired cervical proprioception.

- Migliarese, S., & White, E. (2019). Review of forward-head posture and vestibular deficits in older adults. *Current Geriatrics Reports*, 8(3), 194-201.

Forward Head Posture and Autonomic Function

Forward head posture is associated with abnormal sensorimotor control and autonomic nervous system dysfunction when compared to normal head alignment.

- Moustafa, I. M., Youssef, A., Ahbouch, A., Tamim, M., & Harrison, D. E. (2020). Is forward head posture relevant to autonomic nervous system function and cervical sensorimotor control? Cross sectional study. *Gait & Posture*, 77, 29-35.

Posture and Comprehension

Adopting an upright posture results in maintaining a positive psychological state and improving test performance of children.

- Inagaki, K., Shimizu, T., & Sakairi, Y. (2018). Effects of posture regulation on mood states, heart rate and test performance in children. *Educational psychology*, 38(9), 1129-1146.

Functional Tape and Posture

Kinesio tape is effective for improving head posture from the moment of Kinesio Tape application.

- Kim, E. J., & Kim, D. H. (2018). Immediate influence of application of Kinesio Taping on forward head posture. *The Journal of the Convergence on Culture Technology*, 4(4), 101-105.

Whole Body Vibration and Posture

The current evidence supports the use of whole body vibration to improve sensorimotor deficits involving balance, strength, joint position sense, and muscle activity in people with chronic ankle instability.

- Tan, J., Wu, X., Clark, C. C., Barton, V., Chen, S., Liu, S., ... & Zou, Y. (2022). The effect of whole body vibration on sensorimotor deficits in people with chronic ankle instability: A systematic review and meta-analysis. *Clinical Rehabilitation*, 02692155221095651.