

SPECIAL ISSUE

Posture and Mood: Implications and Applications to Therapy

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Slouched posture is very common and tends to increase access to helpless, hopeless, powerless, and depressive thoughts as well as increased head, neck, and shoulder pain. Described are six educational and clinical strategies that therapists can incorporate in their practice to encourage an upright/erect posture. These include practices to experience the negative effects of a collapsed posture as compared to an erect posture, watching YouTube video to enhance motivation, electromyography to demonstrate the effect of posture on muscle activity, ergonomic suggestions to optimize posture, the use of a wearable posture biofeedback device, and strategies to keep looking upward. When clients implement these changes, they report a more positive outlook and reduced neck and shoulder discomfort.

Background

Most people slouch without awareness when looking at their cell phone, tablet, or the computer screen (Guan et al., 2016) as shown in Figure 1. Many clients in psychotherapy and in biofeedback or neurofeedback training experience concurrent rumination and depressive thoughts with their physical symptoms. In most therapeutic sessions, clients sit in a comfortable chair, which automatically creates a posterior pelvic tilt and encourages the spine to curve so that the client sits in a slouched position. While at home, they sit on an easy chair or couch, which lets them slouch as they watch TV or surf the Web.

In many cases, the collapsed position also causes people to scrunch their necks, which puts pressure on their necks that may contribute to developing a headache or becoming exhausted. Repetitive strain on the neck and cervical spine may trigger a cervical neuromuscular syndrome that involves chronic neck pain, autonomic imbalance, and concomitant depression and anxiety (Matsui & Fujimoto, 2011) and may contribute to vertebrobasilar insufficiency—a reduction in the blood supply to the hindbrain through the left and right vertebral arteries and basilar arteries (Kerry, Taylor, Mitchell, McCarthy, & Brew, 2008). From a biomechanical perspective,

slouching also places more stress on the cervical spine, as shown in Figure 2. When the neck compression is relieved, the symptoms decrease (Matsui & Fujimoto, 2011).

Most people are totally unaware of slouching positions and postures until they experience neck, shoulder, and/or back discomfort. Neither clients nor therapists are typically aware that slouching may decrease energy levels and increase the prevalence of negative (hopeless, helpless, powerless, or defeated) memories and thoughts (Peper & Lin, 2012).

Recommendations to Implement Posture Awareness and Training in Treatment/Education Settings

The first step in biofeedback training and therapy is to systematically increase awareness and retraining of posture before attempting further bio/neurofeedback training and/or cognitive-behavior therapy. If the client is sitting in a collapsed position in therapy, then it will be much more difficult for the person to access positive thoughts, which interferes with further training and effective therapy. Research by Tsai, Peper, and Lin (2016) showed that engaging in positive thinking while slouched requires greater mental effort than when sitting erect, and straightening a slouched posture contributes to elevated mood and positive thinking, with the implication that an upright posture supports positive outcomes that are akin to the beneficial effects of exercise for the treatment of depression (Schuch et al., 2016).

Most people know that posture affects health; however, they are unaware of how rapidly a slouching posture can affect their physical and mental health. Here we recommend some educational and clinical strategies to teach this awareness.

1. Practicing Activities That Raise Awareness About a Collapsed Posture as Compared to an Erect Posture

Guide clients through the practices so that they experience how posture can affect memory recall, physical strength, energy level, and possible triggering of headaches.

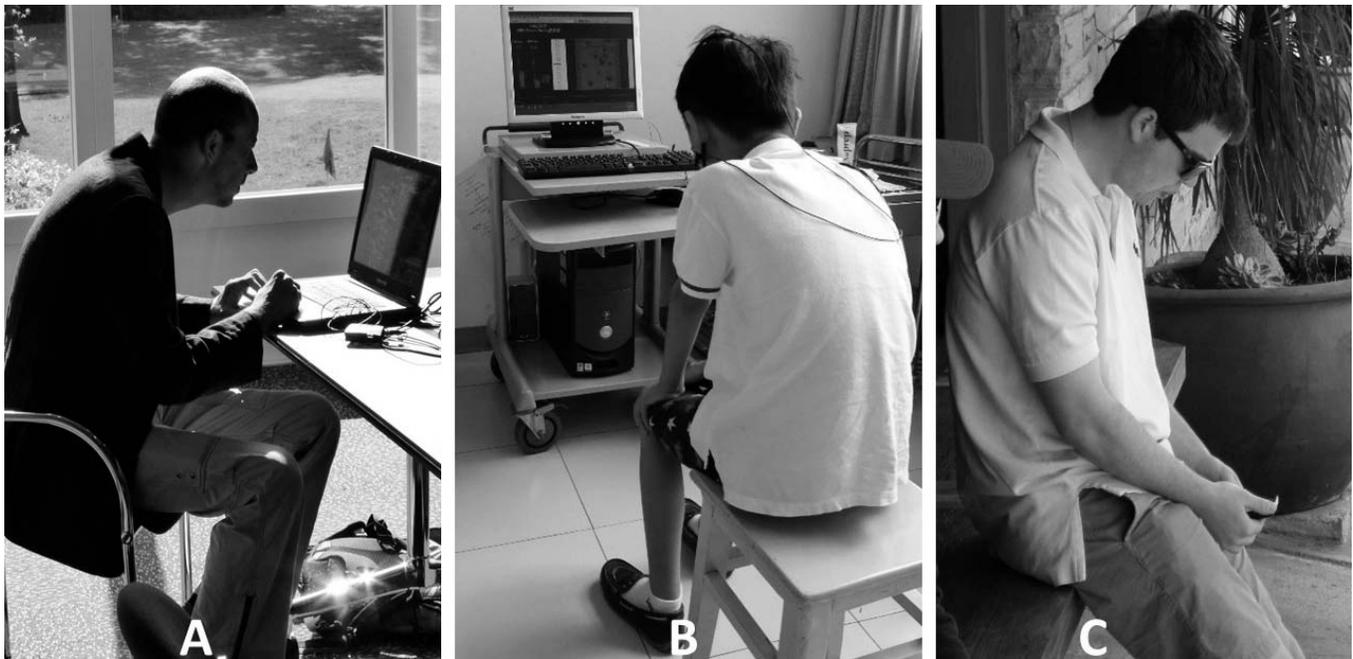


Figure 1. (A). Employee working on his laptop. (B). Boy with ADHD being trained with neurofeedback in a clinic. (C). Student looking at cell phone. When people slouch and look at the screen, they tend to slouch and scrunch their neck.

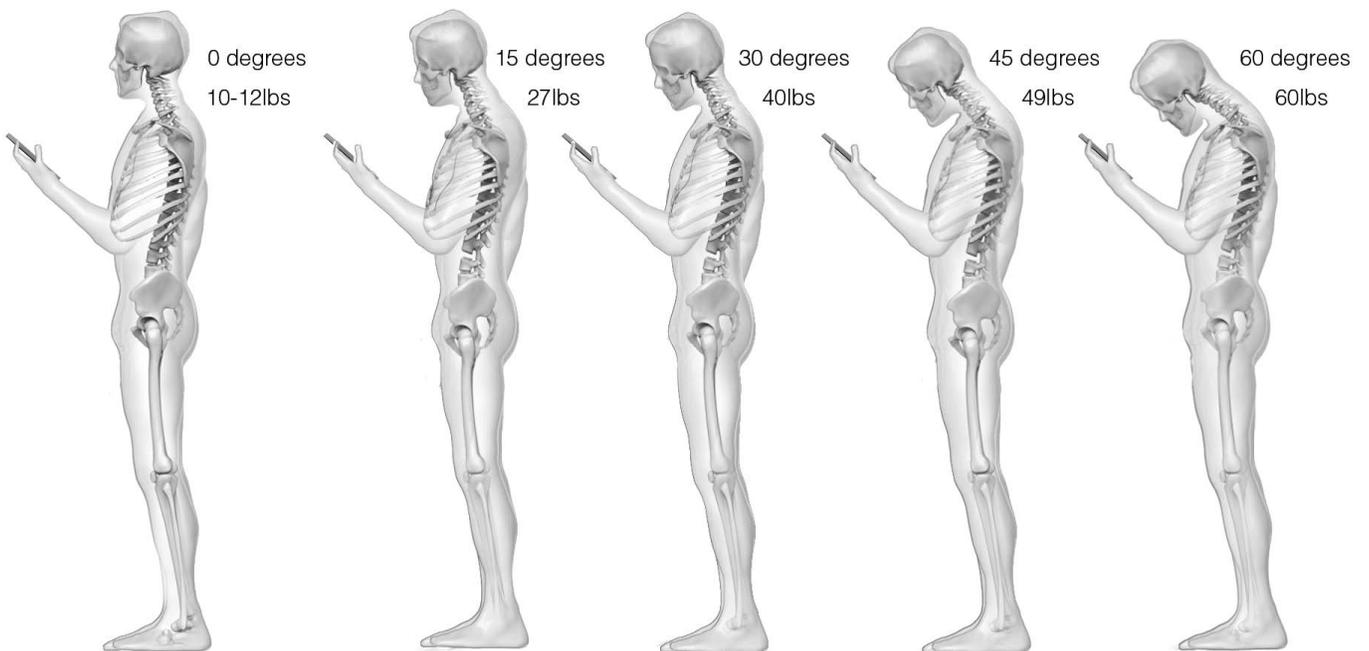


Figure 2. The more the head tilts forward, the more stress is placed on the cervical spine. From "Assessment of Stresses in the Cervical Spine Caused by Posture and Position of the Head," by K. K. Hansraj, 2014, Surgical Technology International, 25, 277-279. Copyright 2014 by K. K. Hansraj. Reprinted with permission.

- a. *The effect of collapsed and erect posture on memory recall.* Participants reported that it is much easier to evoke powerless, hopeless, helpless, and defeated memories when sitting in a collapsed position than when sitting upright. Guide the client through the procedure described in the article “How Posture Affects Memory Recall and Mood” (Peper, Lin, Harvey, & Perez, 2017; see page 36 in this issue).
- b. *The effects of collapsed and erect posture on perceived physical strength.* Participants experience much more difficulty in resisting downward pressure at the wrist of an outstretched arm when slouched rather than upright. Guide the client through the exercise described in the article “Increase Strength and Mood With Posture” (Peper, Booiman, Lin, & Harvey, 2016).
- c. *The effect of slouching versus skipping on perceived energy levels.* Participants experience a significant increase in subjective energy after skipping compared with walking slouched. Guide the client through the exercises described in the article “Increase or Decrease Depression—How Body Postures Influence Your Energy Level” (Peper & Lin, 2012).
- d. *The effect of neck compression to evoke head pressure and headache sensations.* In our unpublished study with students and workshop participants, almost all partici-

pants who are asked to bring their head forward, then tilt the chin up and at the same time compress the neck (scrunching the neck), report that within 30 seconds they feel a pressure building up in the back of the head or the beginning of a headache. To their surprise, it may take up to 5 to 20 minutes for the discomfort to disappear. Practicing similar awareness activities can be a useful demonstration for clients with dizziness or headaches to experience how posture can increase their symptoms.

2. *Watching a YouTube Video to Enhance Motivation*

Have clients watch Professor Amy Cuddy’s 2012 TED Talk, *Your Body Language Shapes Who You Are* (Cuddy 2012), which describes the hormonal changes that occur when adapting an upright power versus a collapsed, defeated posture.

3. *Electromyographic (EMG) Feedback to Demonstrate How Posture Affects Muscle Activity*

Record EMG feedback from muscles such as around the cervical spine, trapezius, frontalis, and masseters or beneath the chin (submental lead) to demonstrate that having the head forward and/or the neck compressed will increase EMG activity, as shown in Figure 3.

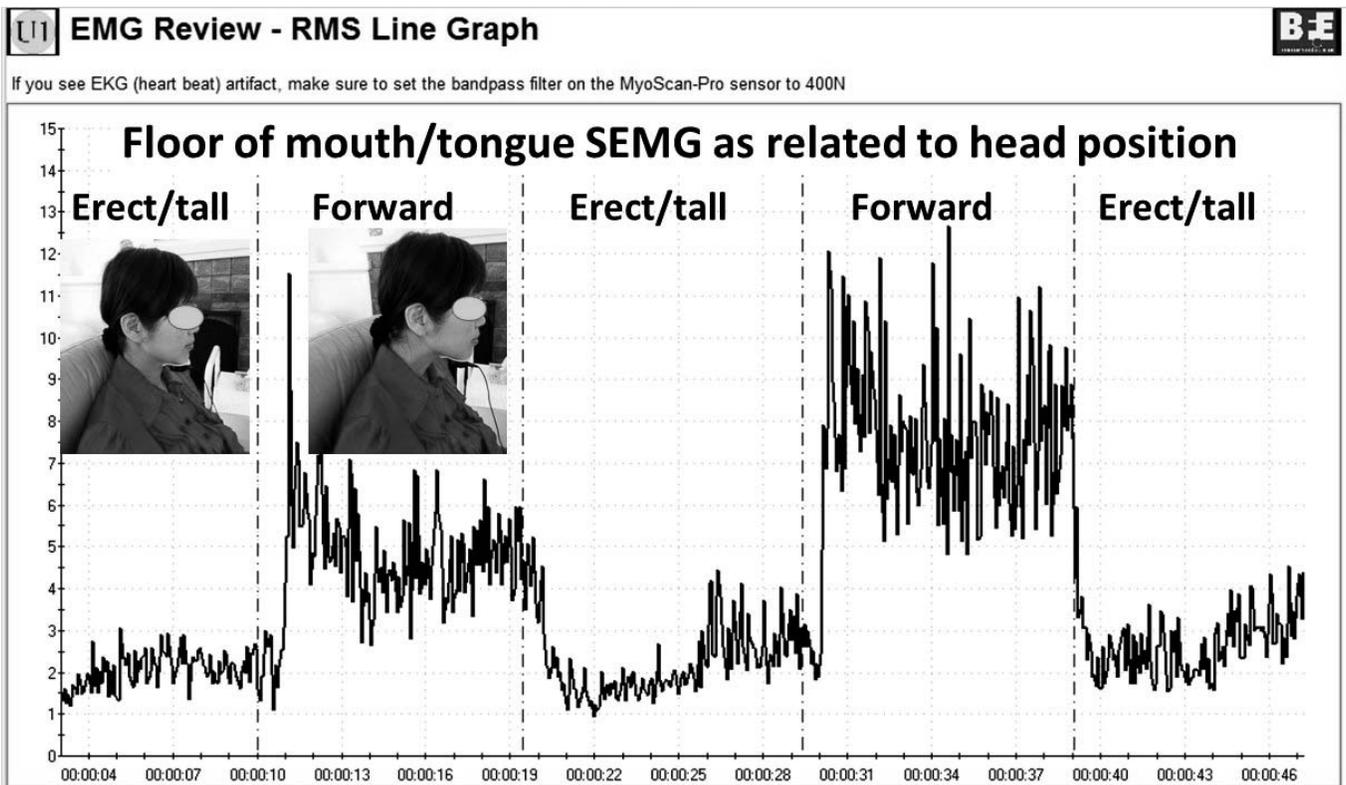


Figure 3. Electromyographic recording of the muscle under the chin while alternating between bringing the head forward or holding it back, feeling erect and tall.



Figure 4. An example of how posture can be affected covertly when one sits on a seat insert that rotates the pelvis anteriorly. (The insert shown in the diagram and used in research referenced is BackJoy™.)



Figure 5. An example of how a small pillow, placed between the back of the chair and the lower back, changes posture from collapsed to erect.

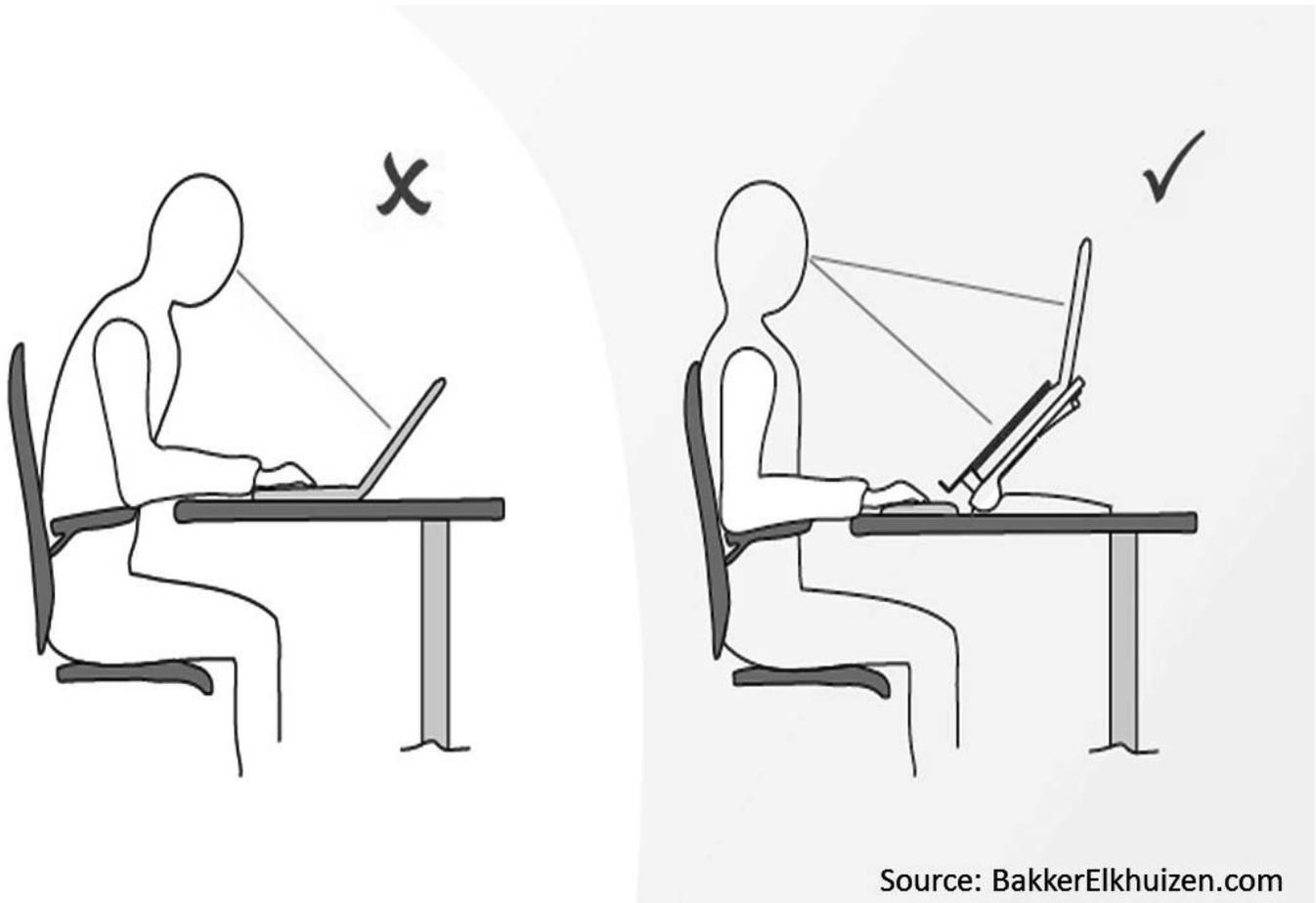


Figure 6. Posture is collapsed when working on a laptop and can be improved by using an external keyboard and monitor. From “Office Employees Are Like Professional Athletes!” by Bakker Elkhuizen. (n.d.). Copyright 2017 by Bakker Elkhuizen. Reprinted with permission.

The client can then learn awareness of the head and neck position. For example, one client with severe concussion experienced a significant increase in head pressure and dizziness when she slouched or looked at a computer screen as well as feeling she would never get better. She then practiced the exercise of alternating her awareness by bringing her head forward and then back, and then bringing her neck back while her chin was down, thereby elongating the neck while she continued to breathe. With her head forward, she would feel her molars touching, and with her neck back, she felt an increase in space between the molars. When she elongated her neck in an erect position, she felt the pressure draining out of her head and her dizziness and tinnitus significantly decrease.

4. *Assessing Ergonomics to Optimize Posture*

Change the seated posture of both the therapist and the client during treatment and training. Although people may be aware of their posture, it is much easier to change the

external environment so that they automatically sit in a more erect power posture. Possible options include:

- a. *Seat insert or cushions.* Sit in upright chairs that encourage an anterior pelvic tilt by having the seat pan slightly lower in the front than in the back or using a seat insert to facilitate a more erect posture (Schwanbeck, Peper, Booi-man, Harvey, & Lin, 2015), as shown in Figure 4.
- b. *Back cushion.* Place a small pillow or rolled-up towel at the kidney level so that the spine is slightly arched, instead of sitting collapsed, as shown in Figure 5.
- c. *Ergonomics.* Check ergonomic and worksite computer use to ensure that the client can sit upright while working at the computer. For some clients, this means checking their vision if they tend to crane forward and thus crunch their neck to read the text. For those who work on laptops, it means using an external keyboard, a monitor, or a laptop stand so the screen is at eye level, as shown in Figure 6.



Figure 7. Illustration of a posture feedback device, UpRight™. It provides vibratory feedback to wearers to indicate that they are beginning to slouch.

5. Wearable Posture Biofeedback Training Device

The wearable biofeedback device, UpRight™, consists of a small sensor placed on the spine and works as an app on the cell phone. After calibration of the erect and slouched positions, the posture device gives vibratory feedback each time the participant slouches, as shown in Figure 7.

Clinically, we have observed that clients can learn to identify conditions that are associated with slouching, such as feeling tired, thinking depressive/hopeless thoughts, or being in other situations that evoke slouching. When people wear a posture feedback device during the day, they rapidly become aware of these subjective experiences whenever they slouch. The feedback reminds them to sit in an erect position, and they subsequently report an improvement in health (Colombo et al., 2017). For example, a 26-year-old man who works more than 8 hours a day on a computer reported, “I have an improved awareness of my

posture throughout my day. I also notice that I had less back pain at the end of the day.”

6. Integrating Posture Awareness and Position Changes Throughout the Day

After clients have become aware of their posture, additional training includes having them observe their posture as well as negative changes in mood, energy level, or tension in their neck and head. When they become aware of these changes, they use it as a cue to slightly arch their back and look upward. If possible, have the clients look outside at the tops of trees and notice details such as how the leaves and branches move. Looking at the details interrupts any ongoing rumination. At the same time, have them think of an uplifting positive memory. Then have them take another breath, wiggle, and return to the task at hand. Recommend to clients that they go outside during

breaks and lunchtime to look upward at the trees, the hills, or the clouds. Each time one is distracted, return to appreciate the natural patterns. This mental break concludes by reminding oneself that humans are like trees.

Trees are rooted in the earth and reach upward to the light. Despite the trauma of being buffeted by the storms, they continue to reach upward. Similarly, clouds reflect the natural beauty of the world, and are often visible in the densest city environment. The upward movement reflects our intrinsic resilience and growth

—Erik Peper

Have clients place family photos and art slightly higher on the wall at home so that they automatically look upward to see the pictures. A similar strategy can be used in the office, using art to evoke positive feelings. When clients integrate an erect posture into their daily lives, they experience a more positive outlook and reduced neck and shoulder discomfort.

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Disclaimer

Conflict of Interest: Author Erik Peper has received donations of 15 UpRight™ posture feedback devices from UpRight (<http://www.uprightpose.com/>) and 12 BackJoy™ seat inserts from Backjoy (<https://www.backjoy.com>) for use in research. Coauthors I-Mei Lin and Richard Harvey declare that they have no conflict of interest.

This report evaluated a convenience sample of a student classroom activity related to posture, and the information was anonymously collected. As an evaluation of a classroom activity, this report of findings was exempted from Institutional Review Board oversight.

References

Bakker Elkhuisen. (n.d.). Office employees are like professional athletes! Retrieved August 23, 2017, from <https://www.bakkerelkhuisen.com/knowledge-center/whitepaper-improving-work-performance-with-insights-from-pro-sports/>

Colombo, S., Joy, M., Mason, L., Peper, E., Harvey, R., & Booiman, A. (2017, March). *Posture change feedback training and its effect on health*. Poster presented at the 48th Annual Meeting of the Association for Applied Psychophysiology and Biofeedback, Chicago, IL.

Cuddy, A. (2012). *Your body language shapes who you are*. Technology, Entertainment, and Design (TED) Talk. Retrieved August 23, 2017, from www.ted.com/talks/amy_cuddy_your_body_language_shapes_who_you_are

Guan, X., Fan, G., Chen, Z., Zeng, Y., Zhang, H., Hu, A., . . . He, S. (2016). Gender difference in mobile phone use and the impact of digital device exposure on neck posture. *Ergonomics*, *59*, 1453–1461.

Hansraj, K. K. (2014). Assessment of stresses in the cervical spine caused by posture and position of the head. *Surgical Technology International*, *25*, 277–279.

Kerry, R., Taylor, A. J., Mitchell, J., McCarthy, C., & Brew, J. (2008). Manual therapy and cervical arterial dysfunction, directions for the future: A clinical perspective. *Journal of Manual & Manipulative Therapy*, *16*(1), 39–48.

Matsui, T., & Fujimoto, T. (2011). Treatment for depression with chronic neck pain completely cured in 94.2% of patients following neck muscle treatment. *Neuroscience & Medicine*, *2*, 71–77.

Peper, E., Booiman, A., Lin, I. M., & Harvey, R. (2016). Increase strength and mood with posture. *Biofeedback*, *44*, 66–72.

Peper, E., & Lin, I. M. (2012). Increase or decrease depression—How body postures influence your energy level. *Biofeedback*, *40*, 126–130.

Peper, E., Lin, I. M., Harvey, R., & Perez, J. (2017). How posture affects memory recall and mood. *Biofeedback*, *45*(2), 36–41.

Schuch, F. B., Vancampfort, D., Richards, J., Rosenbaum, S., Ward, P. B., & Stubbs, B. (2016). Exercise as a treatment for depression: A meta-analysis adjusting for publication bias. *Journal of Psychiatric Research*, *77*, 42–51.

Schwanbeck, R., Peper, E., Booiman, A., Harvey, R., & Lin, I. M. (2015). Posture changes with a seat insert: Changes in strength and not EMG. *Applied Psychophysiology and Biofeedback*, *40*, 128–129.

Tsai, H. Y., Peper, E., & Lin, I. M. (2016). EEG patterns under positive/negative body postures and emotion recall tasks. *NeuroRegulation*, *3*(1), 23–27.



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