

Literature Synthesis on Neurogenic Tremor

Jonas Nordstroem

Saybrook University

RES2100: Research Foundations and Literacy

November, 2021

Literature Synthesis for the Research of Neurogenic Tremor

In this synthesis of the literature for neurogenic tremor research, we look at six articles that deal with the effects of neurogenic tremor. Neurogenic tremor is thought to be the nervous system's natural and innate ability to downregulate to homeostasis after stressful and dangerous events. While one article is about Fitzmaurice Voicework research, the other five are about Trauma Releasing Exercises (TRE), a trauma modality developed by Dr. David Berceli. For over fifteen years I have been working with Dr. Berceli, utilizing neurogenic tremor as a critical component of trauma treatment. Although there have been numerous anecdotal stories about the benefits of neurogenic tremor, and some research has been done in the last five years, there is still far too little solid research on this topic. However, with my dissertation research at Saybrook University, I hope to be part of changing that.

A Brief Summary of the Literature Reviews

Since only half of the six articles included a detailed introduction or literature review, this section is based primarily on those articles. Talvinen (2017) defines stress as any demanding situation for which an individual lacks the necessary resources to cope. Whether the stressful event is perceived as positive or negative, the individual's response is determined by their current resources, attitudes, and perspectives. Prolonged stress can manifest physically as lightheadedness, tiredness, digestive problems, and backaches, as well as psychologically as anxiety, mood swings, hopelessness, aggressive behavior, insomnia, and impaired memory (Mattila 2010; Vichealth 2012 as cited in Talvinen, 2017). Porges (2011, as cited in Thommessen & Fougner, 2020) explains how stressful situations activate the autonomic nervous system's fight, flight, or freeze response. When this occurs, Berceli (2008, 2009) describes how the brain sends signals to the body, as a part of the startle response, to contract the

various muscles involved in moving into a fight-or-flight position. For instance, this includes slightly bent knees, a tightened psoas muscle to facilitate hip flexion, and an activated trapezius muscle to protect the cervical spine. Collectively, this posture enables you to move more quickly and smoothly than you would if you attempted to move with your legs extended and no hip flexion.

Thommessen and Fougner (2020) explain how unresolved stress can result in chronic tension that persists long after the stressful event has passed. According to Berceli (2008, 2009), this is because the hypothalamic-pituitary-adrenal (HPA) axis remains activated, signaling to the brain that the threat or stress remains, causing the body to remain tense and alert. Berceli (2008, 2009) and Scaer (2001) propose that nature evolved neurogenic tremor to deactivate the HPA axis, relieve tension, and restore the body and the nervous system to homeostasis. As evolution developed the fight-flight-freeze response to deal with stress and adversity, they argue nature should have evolved a function to calm the nervous system afterward, which they believe could be the neurogenic tremor.

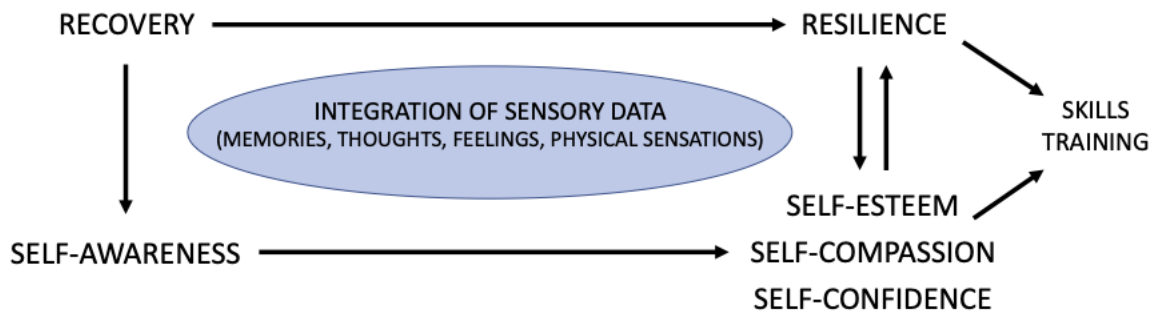
Neurogenic tremor, according to trauma expert Dr. Robert Scaer (2001), is an automatic brainstem response triggered to complete and discharge the fight-flight-freeze mechanism. According to Kollwitz (2016), these tremors are generated by the Golgi tendon organ reflex, which works in conjunction with muscle spindles to inhibit and activate motor neurons. When the tendon becomes too tight, the Golgi receptors stop the spinal cord motor neurons, resulting in muscle relaxation. When this occurs, the muscle spindles trigger the stretch reflex, which causes the motor neurons to fire again, resulting in a cycle of alternating contractions and relaxations, also known as tremoring.

A Synthesis of the Presented Results

An interesting pattern emerged after reading the results of the six articles and taking notes on the key findings in each article. Although this pattern is based on only six articles, it is consistent with the results I have seen in thousands of clients who have used neurogenic tremor for a variety of reasons, from processing trauma and healing PTSD to using it as an introspective exercise to learn more about themselves, make better decisions, or simply feel happier and more content. What appears to be consistent across all six articles, regardless of whether the findings are from a qualitative, quantitative, or mixed research study, is that participants who used neurogenic tremor appeared to progress from recovery to resilience, and as self-awareness increased, largely as a result of initiating a recovery process, so did self-esteem, self-confidence, and self-compassion, as shown in Figure 1.

Figure 1.

From Recovery and increased Self-awareness to Resilience.



In terms of *recovery*, Heath and Beattie (2019), Kollwitz (2016), Lynning et al. (2021), and Talvinen (2017) demonstrate how neurogenic tremor reduces the nervous system's stress response, resulting in participants feeling more relaxed, calm, and at ease, as well as improved sleep and digestion. While Heath and Beattie (2019) and Lynning et al. (2021) also discovered

that participants felt less pain and discomfort, Heath and Beattie (2019) and Talvinen (2017) demonstrated improvement in trauma and PTSD healing.

It appears that a critical component of the recovery process, and a natural process as *self-awareness* grows, is that participants become more aware of their thoughts, feelings, and physical sensations, as well as, in some cases, process unresolved past memories. Thommessen and Fougner (2020) and Kollwitz (2016), for example, reported increased self-awareness of the body and mind, including increased awareness of actions and thoughts, while Heath and Beattie (2019) described it as feeling more at ease and at home in one's body. An interesting question that arises is whether self-awareness and the ability to be present with the thoughts, feelings, physical sensations, and memories that arise are critical components of the actual recovery and healing process. What would happen if someone used neurogenic tremor and attempted to block out sensory input? Would the results have been different? This is something I will consider as I design my research project.

As the recovery process progresses and self-awareness improves, Kollwitz (2016) and Thommessen and Fougner (2020) describe how neurogenic tremor helps people process and let go of emotional negativity such as fear and anxiety, which in turn also seems to improve their performance and sense of being prepared and in control. These factors, along with the report of better capacity to deal with adversity demonstrated by Berceli et al. (2014) and Kollwitz's (2016) report of increased self-regulation, suggest that participants' *resilience* is enhanced. Hand in hand with resilience strengthening, *self-esteem*, *self-compassion*, and *self-confidence* also appear to improve. For instance, while Berceli et al. (2014) indicated that consistent use of neurogenic tremor leads to increased self-esteem and confidence in one's ability to cope with stress, Talvinen (2017) showed that compassion for self and others increases, and Heath and Beattie (2019) noted

that one also feels more self-sufficient and motivated. Finally, Thommessen and Fougner (2020) demonstrated that neurogenic tremor can improve not only performance under pressure, but also the quality and efficiency of *skills training*. This is also supported by Kollwitz's (2016) findings, which indicate that participants' reduction in performance anxiety enhances both performance and performance enjoyment.

Ideas Regarding the Used Research Methods

After compiling the six research articles on neurogenic tremor, it became clear how little is still known scientifically about this topic. I discovered that there were very few articles on neurogenic tremor, indicating that there was a significant gap in the literature on my topic, i.e., both the empirical and evidence gaps. By broadening my search criteria, I was able to find other relevant articles, such as those on essential tremor, that will help me better understand what happens in the brain and nervous system when tremor occurs. I'm aware of some other therapeutic methods that use tremor as part of the healing process, and I'll do my best to learn about them so that I can incorporate them into my research.

While Thommessen and Fougner's (2020) qualitative study taught me how to use semi-structured interviews in a focus group setting, Kollwitz's (2016) qualitative study taught me how to use grounded theory to learn more about a new topic. Both studies, in my opinion, demonstrated the power of qualitative studies in understanding a phenomenon that has not been well researched, as well as how similar the experiences of people who use neurogenic tremor can be, regardless of the setting or population that uses it. After reading the qualitative sections of Heath and Beattie's (2019) and Talvinen's (2017) mixed methods studies, I came to the same conclusions. Regardless of occupation, climate, or culture, it appears that everyone has a similar experience of their inner world. A stressed and tense body appears to feel the same in Finland as

it does in Brazil, though I'm sure climate and culture differences make a big difference, at least at the group level, for example, in how stress is internalized or externalized.

The researchers involved in the quantitative studies by Berceci et al. (2014) and Lynning et al. (2021) appeared to have more experience conducting research and also had different skills present in the group of researchers, such as one person conducting data collection and another performing statistical analysis. As a result, these studies were more professional and contained more of the information that we should consider when evaluating an article's quality. The same observation was made with regard to the mixed method studies. While Talvinen (2017) describes how her advisors provided extensive assistance in designing and carrying out her study, Kollwitz (2016) is an assistant professor who appears to have a strong understanding of and experience with research.

Reflections on Research Paradigms and the Writing of this Paper

In terms of research methodology, I initially preferred the use of mixed methods. The reason for this was that mixed methods research, which includes both qualitative and quantitative data, can assist the researcher in gaining a broader perspective on the topic under study. However, after reading these six articles, I believe that a mixed methods approach may be too time consuming and difficult to narrow down for a dissertation research project, and thus may not be appropriate for me. Furthermore, although qualitative research provides significant insight into a phenomenon, in this case the efficacy of neurogenic tremor as a form of therapy, it appears to be less valued in the medical community. In a society that still prefers a positivist approach, perhaps because it is easier to understand and has fewer variables to consider, I believe that a quantitative study could add more power and value to the therapeutic community that uses neurogenic tremor as a treatment modality.

When I train counselors, psychologists, or physicians in the use of neurogenic tremor, they almost always ask if there are quantitative studies on neurogenic tremor, and especially if they include biological measures such as measuring blood cortisol levels or heart rate variability (HRV) to better assess what neurogenic tremor actually does to the nervous system. Only one of the six articles on neurogenic tremor included a biological measurement, in this case HRV.

When I broadened my search for articles, I discovered another unpublished study that investigated the effects of neurogenic tremor on HRV. Both Talvinen (2017) and the unpublished study by Torres de Almeida and Rodrigues (2021) found an improvement in HRV after using neurogenic tremor, implying a reduction in stress in the autonomic nervous system and that the functions of the sympathetic and parasympathetic nervous systems work more in balance with each other, as opposed to stress, when one of the two systems takes precedence over the other. Although these two studies provide a wealth of useful information about how HRV can be used in researching neurogenic tremor, one was conducted in Finnish and the other has not been published.

In conclusion, although I tend to favor the post-positivist perspective and qualitative studies, I would prefer to conduct a quantitative study for my dissertation project, using scales such as Quality of Life, Flourishing Scales, and Perceived Stress Scales to measure the potential impact of neurogenic tremor on stress and resilience, as well as incorporating HRV to more closely track changes in sympathetic and parasympathetic activity, or perhaps even an fMRI to learn even more about what happens in the brain when neurogenic tremor occurs. Overall, I learned a great deal about my research topic as well as how to conduct a research study. I am inspired to learn more in this course and in all future courses at Saybrook University.

References

- Berceli, D. (2008). *The revolutionary trauma release process: transcend your toughest times*. Canada: *Namaste Publishers*.
- Berceli, D. (2009). *Evaluating the effects of stress reduction exercises employing mild tremors: a pilot study [dissertation]*. *Arizona State University*.
- Berceli, D., Salmon, M., Bonifas, R., & Ndefo, N. (2014). Effects of Self-induced Unclassified Therapeutic Tremors on Quality of Life among Non-Professional Caregivers: A Pilot Study. *Global Advances in Health and Medicine*, 3(5), 45-48. 10.7453/gahmj.2014.032
- Heath, R., & Beattie, J. (2019). Case Report of a Former Soldier Using TRE (Tension/Trauma Releasing Exercises) for Post-Traumatic Stress Disorder Self-Care. *Journal of Military and Veterans' Health*.
- Kollwitz, M. (2016). Breath, tremoring, and performance anxiety: How can Fitzmaurice Voicework's Deconstructing address performance anxiety in undergraduate acting training? *Voice & amp; Speech Review*, 10(2-3), 100-120. 10.1080/23268263.2016.1349726
- Lynning, M., Svane, C., Westergaard, K., Bergien, S. O., Gunnensen, S. R., & Skovgaard, L. (2021). Tension and trauma releasing exercises for people with multiple sclerosis – An exploratory pilot study. *Journal of Traditional and Complementary Medicine*, 11(5), 383-389. 10.1016/j.jtcme.2021.02.003
- Scaer, R. (2001). *The body bears the burden: trauma, dissociation and disease*. New York: *Hawthorn Press*.
- Talvinen, H. (2017). *The effects of TRE-method on stress relief. Pilot study for employees of psychiatric work at Kuopio Psychiatric Center and Julkula Hospital*. *Savonia University of Applied Sciences*.

Thommessen, C. S., & Fougner, M. (2020). Body awareness in acting - a case study of TRE as a supporting tool for drama students' personal and professional development. *Theatre, Dance and Performance Training*, 11(4), 434-452. 10.1080/19443927.2019.1694971

Torres de Almeida, J., & Rodrigues, G. O. (2021). The TRE process improves HRV and psychophysiological stress in university students. Unpublished manuscript.

<https://traumaprevention.com/wp-content/uploads/2021/09/2021->

[Almeida Rodrigues Effecs-of-TRE-on-HRV Psychophysiological-Stress.pdf](#)