Resting Heart Rate and Frequency of Meltdowns

Ms Adrienne Furness[1]
[1]University of Sydney, [2]Adrienne J Furness

Biography:
Adrienne was a classroom teacher before the words autism and meltdown became part of popular language. From teaching Adrienne moved into technology and software design, and adult education in various corporate arenas. To wrap Adrienne's interests of Education, Neuroscience and Technology together, she commenced studies at the University of Sydney seeking a Masters of Learning Science and Technology. These studies conclude with a research project she has held close for more than 6 years.

With the increase in issues of the mind impacting the classroom – ASD, anxiety and stress, behavior, meltdowns and disruptions, Adrienne's research looks at the Autonomic Nervous System and internal state using the readily available Fitbit. While most use a Fitness Tracker to measure health in steps and exercise, Adrienne correlates various data elements to inform on the regulatory status that may possible predict an imminent meltdown.

Adrienne is a mother, educator, researcher, and application designer, with a long history in technology. Adrienne encourages heart-based interventions and the adaptation of regulatory state through breath. She seeks interventions which can lead to greater self-regulation and better health outcomes for those on the Autism Spectrum and those supporting them.

Background
Affect dysregulation episodes ('meltdowns') are a common problem for those with Autism Spectrum Disorder (ASD), co-experienced by parents, family members, and teachers as well as the individual diagnosed with ASD. While affect dysregulation or affect failures are not part of the formal diagnostic criteria for ASD (DSM-5, 2013, APA), stress and anxiety are often sideline diagnoses which have an additional impact. A build up in the sympathetic nervous system (SNS) can lead to outward expressions of anger, aggression, meltdowns and self-injury, or internal expressions of crying, rumination, worry and depression.

Previous studies have indicated that those with autism can have twice the resting heart rate of non-autistic peers. If the resting heart rate is an indicator of a highly engaged SNS an affect dysregulation episode (meltdown) can occur without warning or visible external signs of the internal stress levels.

Purpose
This pilot study, -in process, investigates the correlation between resting heart rate and frequency of meltdowns. Using Fitbit Charge2 technology and smart-phones, biofeedback data is retrieved from children aged 6-9 years, formally diagnosed with ASD, over a 30-day period during non school hours, with parallel tracking of the meltdown events using a mobile app during this period. The FitBit Charge2 technology was chosen for its capacity to measure biofeedback of heart rate, resting heart rate, sleep, activity and sedentary behaviors in a non-invasive way close to 24/7. The mobile app was designed by the presenter with unique links for each participant.

Strategy and Method

The research strategy consists of a quasi-experiment using quantitative data collection from the Fitbit and qualitative tracking of meltdown events entered by the parents. Each meltdown event was recorded in two stages. Stage one was to capture as close to real-time as possible for a meltdown event with a brief memory jogger. Stage two was to update later with additional qualitative data based on parent reports of the perceived trigger, duration, expression and recovery.