

# When the Body Speaks: An Occupational Therapy–Led Sensory Approach to Tic Management in Tourette syndrome and Functional Neurological Disorder – Case Study

## Authors and Affiliations

Ione Georgakis<sup>1,2,3</sup>, and Edward Palmer<sup>1</sup>

<sup>1</sup>Tourettes Action <sup>2</sup>Sheffield Hallam University <sup>3</sup>Sensory Integration Education Network



## BACKGROUND

Premonitory urges in Tourette syndrome (TS) are often perceived as uncomfortable interoceptive experiences. Variations in interoceptive sensitivity, characterised by hypo- or hyper-responsivity to internal bodily signals, can impact an individual's ability to recognise and articulate these experiences. This sensitivity also influences the perceived intensity, physical impact, and psychological distress associated with these urges. Consequently, this may hinder participation in traditional tic management strategies, such as Habit Reversal Training (HRT), and increase susceptibility to functional symptoms. Neurodevelopmental conditions, such as TS and the frequently co-occurring Autism Spectrum Conditions (ASC), are linked to differences in sensory domains, including processing, integration, modulation, and reactivity.

## METHODS

- Eight-session community paediatrics Occupational Therapy–led intervention
- 15-year-old female who had previously unsuccessful engagement with HRT.
- Diagnoses of TS, Functional Neurological Disorder (FND) and tic-like behaviours and was awaiting an ASC assessment.
- Presented with severe motor and vocal tics (YGTSS = 86), coprolalia, non-epileptic seizures, alexithymia, and significant sensory sensitivities, contributing to reduced school attendance (61%).

## INTERVENTION

### ASSESSMENT

- Getting to know you/ LEGO games
- Administration of YGSSTS

### ASSESSMENT / GOALS

- Occupational Therapy interview
- Goal setting
- Adult/Adolescent Sensory History (AASH) self-report and parent/carer

### PSYCHOEDUCATION

- Face-to-face psychoeducation for young person, parents, and siblings

### SCHOOL CONSULTATION

- 1:1 online meeting with SENCO and Head of Year, staff training on TS, functional tics and FND, including attention, arousal, and sensory influences
- Support and response plan, use of ABC charts to monitor symptoms and FTLB

### SENSORY INTERVENTION

- Review of assessment outcomes and sensory psychoeducation
- Tactile / auditory modulation strategies

### SENSORY INTERVENTION

- Interoceptive awareness training to build recognition of premonitory urge, bathroom cues, and stress signals

### SENSORY INTERVENTION

- Proprioceptive and vestibular input for regulation
- Sensory attention reorientation strategies

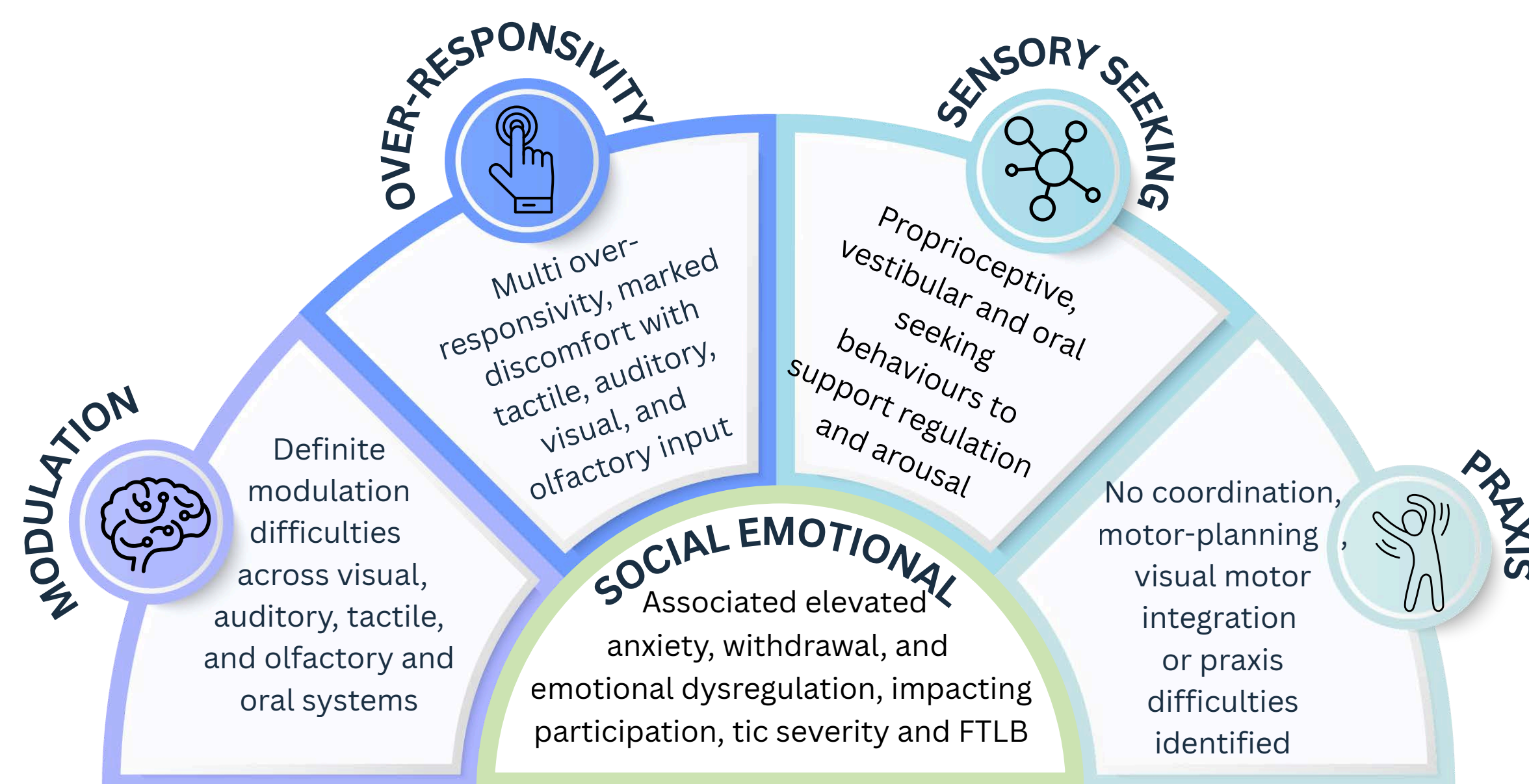
### SENSORY INTERVENTION

- Individualised sensory regulation ladder
- Re-administration of YGTSS

### REVIEW / GOALS / FEEDBACK

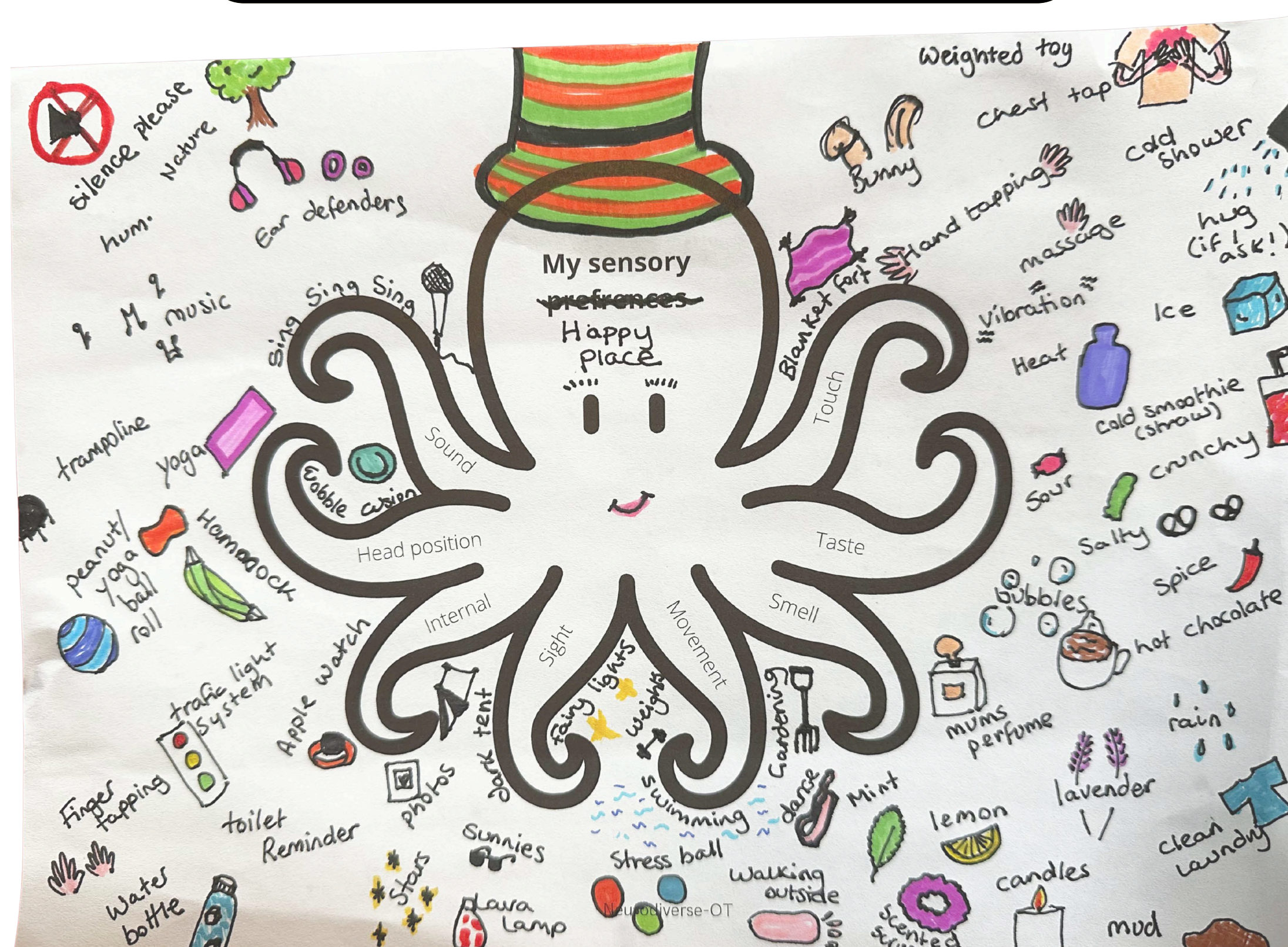
- Four-week post-intervention telephone review and GBOS outcome measures and digital feedback forms

### Adult/Adolescent Sensory History outcomes



Goals	Confidence
I want to better understand my tics	2/10
I want to better manage my tics	3/10

### Personal Sensory Supports

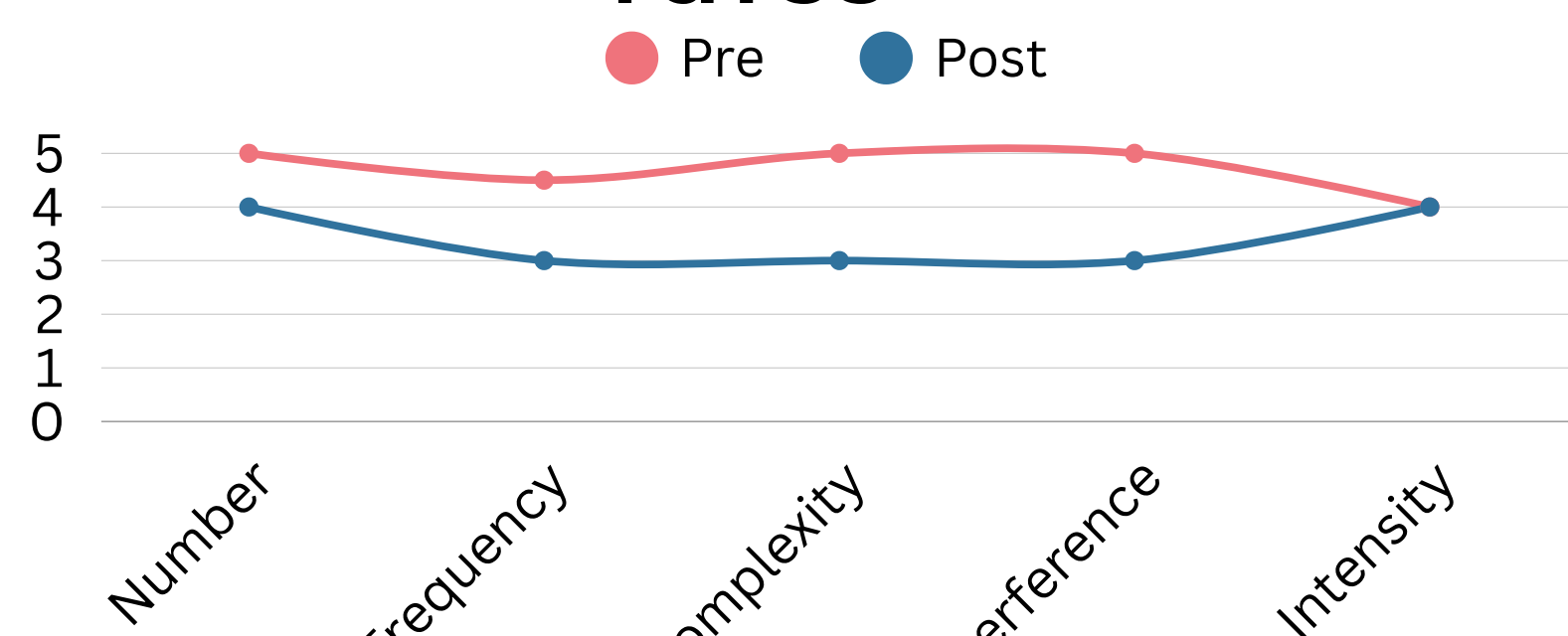


### Sensory Modulation Ladder

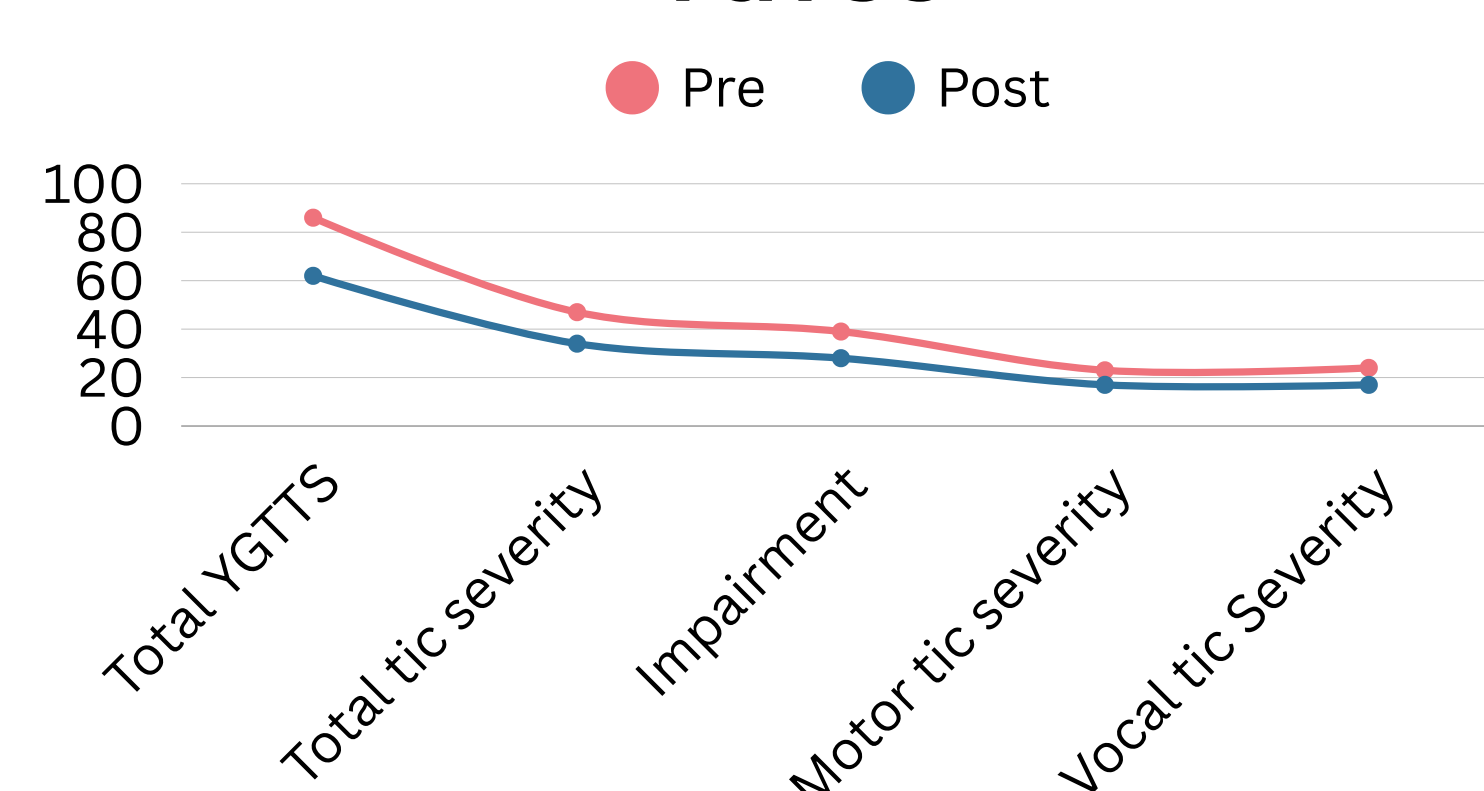
What I feel	What you might see	What I need
Shut down Overwhelmed Fight Flight Freeze Anger Hot Too much!	<ul style="list-style-type: none"> <li>• Self-Hitting</li> <li>• Punching objects</li> <li>• Screaming or shouting</li> <li>• Head banging</li> <li>• Picking my skin/scratching</li> <li>• Panic attacks</li> <li>• Agitated</li> <li>• Non verbal</li> <li>• Non-epileptic seizures</li> <li>• 'Tic attacks'</li> <li>• Throwing objects</li> <li>• Big tics</li> <li>• Complex tics</li> <li>• Breaking my own and other people's things</li> <li>• Not attending school or social activities</li> </ul>	<ul style="list-style-type: none"> <li>• Ice</li> <li>• Timed tapping, fingers, chest</li> <li>• Butterfly hug</li> <li>• Privacy from others</li> <li>• Low demand setting</li> <li>• Reduce external stimuli</li> <li>• Environmental I spy game</li> <li>• No background noise</li> <li>• Scented scrunchie (mums perfume)</li> <li>• Time in dark tent with fairy lights</li> <li>• Vibrating pillow squeeze and breathe</li> <li>• Weighted soft toy</li> <li>• Slow rocking motions</li> <li>• Time in my body sock - alone</li> </ul>
Overstimulated Irritated Fizzy Short fuse Unfocused Restless Unheard	<ul style="list-style-type: none"> <li>• Agitated</li> <li>• Touching objects</li> <li>• Touching other people</li> <li>• Covering my ears</li> <li>• 'Snappy' or 'Sassy'</li> <li>• Pacing my room</li> <li>• Lots of tics</li> <li>• Swearing tics</li> <li>• Difficulty suppressing my tics</li> <li>• Not attending school but still attending social activities</li> </ul>	<ul style="list-style-type: none"> <li>• A new environment</li> <li>• Crunchy, salty, or sour snack</li> <li>• My 'Chill Winston' playlist</li> <li>• Deep pressure on my hands - self massage/pressure points</li> <li>• Fresh air/time outside to walk and run</li> <li>• Scented oil - lavender, jasmine and orange</li> <li>• Slow rocking motions</li> <li>• Roll body on exercise ball</li> <li>• Body weight exercise - wall sits, weights, resistance band, swim</li> </ul>
Calm Focused Alert At my best In my wise mind Ready to rock Ninja mode	<ul style="list-style-type: none"> <li>• Engaging with people</li> <li>• Being my best fun self</li> <li>• Spending time with others</li> <li>• Doing my activities</li> <li>• Attending school</li> <li>• Eye tics</li> <li>• Mouth tics</li> <li>• Nose clearing tics</li> <li>• Steady tic severity</li> <li>• Using my fidget toys</li> <li>• Humming</li> <li>• Asking other people questions</li> <li>• In communal areas in the house and school</li> <li>• Attending school and social activities/dance</li> </ul>	<ul style="list-style-type: none"> <li>• Regular movement breaks</li> <li>• Timed finger tapping</li> <li>• Fidgets</li> <li>• Music in the background</li> <li>• Wobble cushion</li> <li>• Resistance band on my chair</li> <li>• Controlled sounds</li> <li>• In ear noise reducing head phones</li> <li>• Digital and physical prompts to eat/drink</li> <li>• Time outside</li> <li>• Barefoot nature walking</li> <li>• Reminders of my long term goal</li> <li>• Praise and positive feedback</li> <li>• Visual feelings check in</li> </ul>
Under-stimulated Sloth mode Tired Unmotivated Can't be bothered Hopeless Bored	<ul style="list-style-type: none"> <li>• Slow</li> <li>• Sleepy</li> <li>• In bed</li> <li>• No energy</li> <li>• Low mood / tearful</li> <li>• Spaced out</li> <li>• Low motivation</li> <li>• Can't be bothered</li> <li>• Quiet talking</li> <li>• Barely any tics</li> <li>• Heavy and sore</li> <li>• Not attending school or social activities or dance</li> </ul>	<ul style="list-style-type: none"> <li>• 'Morning madness' playlist</li> <li>• Cold drink - smoothie or iced coffee</li> <li>• Shower</li> <li>• Lemon / mint body wash</li> <li>• Bouncing or spinning</li> <li>• 'Dance it out'</li> <li>• Spiked massage ball on feet</li> <li>• Walk on the textured mat</li> <li>• Sorting games</li> <li>• Lego</li> <li>• Cold air / time outside</li> <li>• Bare foot nature walking</li> </ul>

## OUTCOMES / CONCLUSIONS

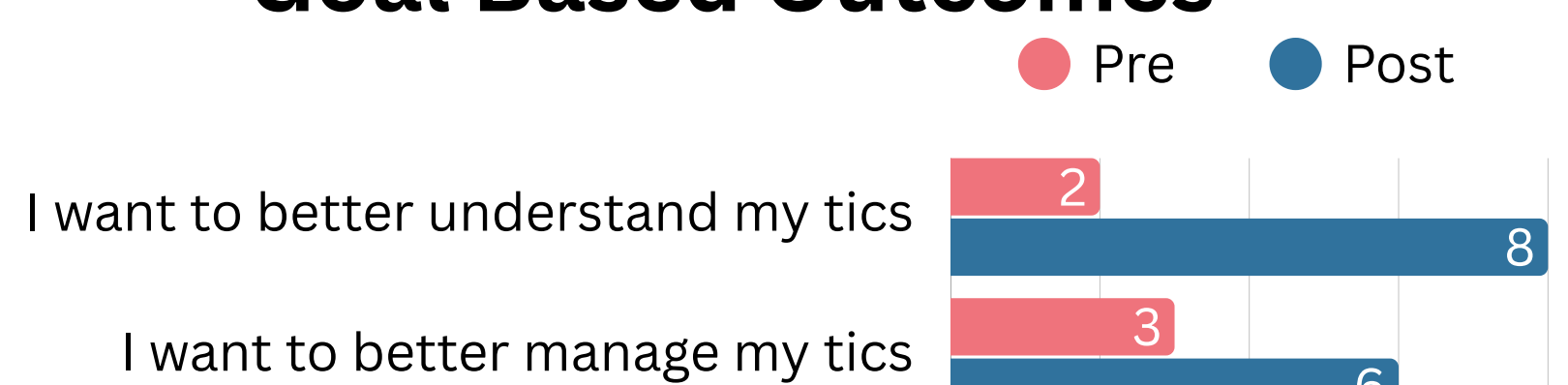
### YGTSS



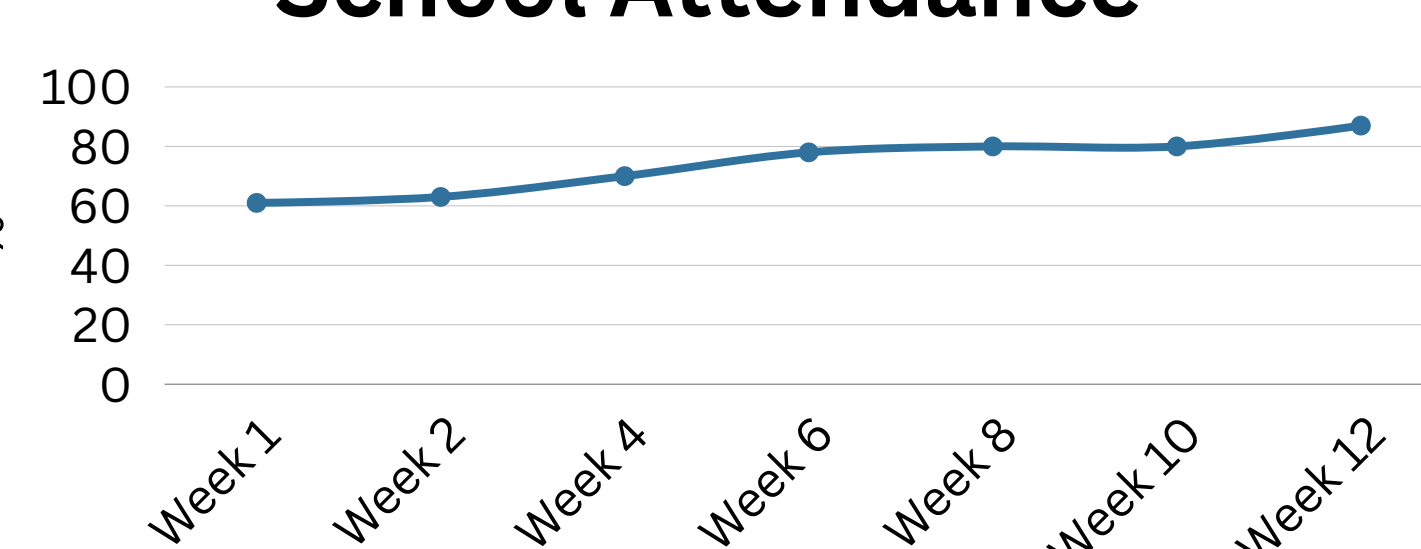
### YGTSS



### Goal Based Outcomes



### School Attendance



Reduced frequency and duration of non-epileptic seizures

Improved confidence and consistency in managing tic and FND symptoms for parents and school staff

Tic severity decreased (YGTSS: 86–62), notably in impairment, frequency, and complexity

Greater engagement with sensory-based supports, reported to be more enjoyable and less distressing than previous HRT attempts

Enhanced awareness of premonitory urges, reduced tic-related distress, better arousal regulation, and increased participation in activities

Highlights the potential benefits of sensory-informed methods combining interoceptive awareness with sensory modulation and attention-based strategies to reduce tic and functional symptomatology