

SENSORY INTEGRATION

What is the current level of knowledge and confidence of mainstream school SENCOs in sensory integration theory and using sensory strategies within education?

*JENNY QUINN, KATY PEDLOW and
CHRIS BLEAKLEY*

The aims of the study were: to identify the number of SENCOs who have received specific training on sensory integration. To determine the understanding of the eight senses and sensory integration theory and sensory strategies. Determine any common gaps in knowledge or misconceptions. Fifty-five surveys were completed. 40% of respondents had received training on sensory processing. There was a significant chi-squared correlation between those that had received training and those that stated they did not know or made guesses about what the vestibular and proprioceptive senses are important for. There was a correlation between those that had received training and those that had good knowledge of the signs of sensory hyper-responsivity. There was no statistical significance of increased knowledge on sensory hypo-responsivity between those who had and had not received training. SENCOs who rated their school as being sensory-friendly had a greater understanding of what sensory integration is important for.

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Pertinently, those who rated their school as being ‘sensory-friendly’ (45.5%) were 8.5 times more likely to know sensory integration is needed for self-regulation. A number of recommendations are made including the need for greater collaboration between therapists and teachers to increase understanding of sensory integration and the impact of this on a child’s education and wellbeing at school. Sensory strategy programmes are to be written with teaching staff and not given by the therapist in an ‘expert’ role. Sensory integration awareness training, including why and how to utilise sensory strategies, is to be encompassed in the SENCO national qualification.

Key words: SENCO, mainstream, sensory, sensory strategies, collaboration.

Background

‘Inclusive education’ is an internationally recognised term. The definition has evolved to encompass school practices, policies and procedures to fully facilitate children with special educational needs (SEN) in mainstream settings (Ewing *et al.*, 2017). The literature provides varying perspectives on the success, benefits and challenges of implementation (Farrell *et al.*, 2007; Florian, 2014; Engelbrecht and Savolainen, 2018). Inclusive education requires teachers to adopt flexible teaching styles to improve academic attainment whilst simultaneously managing increasingly complex behaviours in mainstream schools (Ferguson, 2008). In 2015, it was reported 1 in 5 children leave primary school with below the minimum expected level in reading, writing and mathematics (Department for Education, 2016). Teachers have reported talking out of turn, unnecessary noise-making, distracting others, disobedience and aggression as areas of concern and increased stressors in the classroom (Clunies-Ross *et al.*, 2008). Furthermore, conduct problems and hyperactivity have been positively correlated to increased conflict in student-teacher relationships (Walker and Graham, 2021).

There are eight senses. These are vision, hearing (auditory), touch (tactile), smell (olfactory), taste (gustatory), proprioception, vestibular and interoception. The receptors

for proprioception are in the muscles, joints and tendons. This system tells the brain where the body is in space. It is needed for grading force and skilled actions. The receptors for the vestibular system are in the inner ears. It is needed for knowing where we are in relation to gravity, muscle tone, postural control, eye movement and bilateral coordination (Ayres, 1972; Lane *et al.*, 2009). In more recent years there has been increasing understanding of the role of the eighth sensory system, interoception. This system provides information on what is happening internally; the physical sensations, pain, thirst, hunger and many more (Mahler, 2017). The senses do not work in isolation; for humans to understand the world and engage with it, integration of this sensory information is needed (Ayres, 1972; Lane *et al.*, 2009).

Sensory integration theory, supported by neuroscience research, suggests humans are experience-dependent learners (Ayres, 1991; Stein and Stanford, 2008; Parsons, 2017). If a child is not processing sensory information correctly it can lead to difficulties with self-regulation, modulation (the ability to filter in and filter out irrelevant stimuli), muscle tone, postural control, coordination and praxis (the generation of an idea, motor plan and subsequently performing the desired task). These have an impact on a child's ability to maintain focus, control impulses, engage socially and learn new things to increase independence across all areas of life and academic learning. (Lane *et al.*, 2009) Thus, it can be assumed, for children with sensory processing difficulties, getting the correct sensory feedback can reduce the listed unwanted classroom behaviours contributing to the challenges of achieving truly inclusive education. A sensory strategy timetable, also known as a 'sensory diet' (Wilbarger and Wilbarger, 2002) is developed by an occupational therapist, physiotherapist or speech and language therapist to provide the identified sensory input required by the child to improve their participation. These should be individualised and based on a detailed assessment of the child's neurological thresholds and responses to sensory stimuli (Pingale *et al.*, 2019). Sensory strategy programmes are not Ayres Sensory Integration® (ASI) intervention. Ayres Sensory Integration® is a treatment approach that can only be carried out by a therapist with specific post-graduate training.

Literature has focused on the identification, assessment, impact, and management of sensory impairment (visual and auditory), sensory perception and sensory processing for children with ASD, in the school environment (Larocci and McDonald, 2006; Frederickson, 2009; McInerney, 2014; Miller Kuhaneck and Kelleher, 2015; Edwards, 2016; Robertson and Baron-Cohen, 2017). There are numerous studies on the effectiveness of specific sensory strategies in the classroom, from the therapist viewpoint (Watling and Hauer, 2015; Schaaf *et al.*, 2018).

A clear gap in the literature is the knowledge of teaching staff and/or SENCOs on sensory integration theory (Ayres, 1972) and sensory strategy use. The provision of training on sensory processing is not part of the teaching on SENCO training programmes. In some areas, the NHS or other bodies provide training to schools; there is no formal requirement or national consistency.

Aim

The aim of this research was to identify the level of knowledge and confidence amongst SENCOs in relation to sensory processing from a Sensory Integration Theory (Ayres, 1972) perspective. The study objectives were to:

- Identify the number of SENCOs who have received specific training on Sensory Integration.
- Determine the understanding of the eight senses, sensory integration theory and sensory strategies.
- Determine any common gaps in knowledge or misconceptions.

Method

Ethical approval was sought and granted by the Ulster University ethics committee. A quantitative survey was developed with a project group including OTs and SENCOs. The first section aimed to determine demographic information through Likert scale ratings and yes/no answering. This included the length of time employed in the SENCO role, amount of time each week designated to the role, whether or not they feel their school is ‘sensory-friendly’ and if they have received any specific sensory integration training. The second section included a number of multiple choices and true and false questions to assess knowledge. In an attempt to avoid bias from guessing, an option for ‘I don’t know’ was included for all relevant questions. The survey was hosted on Survey Monkey and distributed via email link. The researcher recruited respondents by attending SENCO group meetings and forwarding an email with the link to local authority SEN managers. Additional participants were recruited through SENCOs sharing the survey with colleagues. The cover page explained consent and stated participants could withdraw at any stage. There was an option for participants to opt in a draw to win a free days training on sensory processing for their school. When the survey closed, these were separated from the data to ensure anonymity.

The following inclusion criteria were applied:

- Qualified teacher currently working as a SENCO within a mainstream school. (SENCOs working in special schools were excluded.)
- SENCOs from both primary and secondary levels of education.
- SENCOs who have and have not completed the SENCO national qualification.

Data analysis

A total of 55 surveys were completed between April and June 2019. The Statistical Package for the Social Sciences (SPSS) version 25 was used to analyse the data. Descriptive statistics were used to identify percentages and frequencies of demographic information. The chi-squared test was used to determine if there was a significant relationship between individual and grouped variables. Grouped variables included tests of knowledge. For multiple-choice questions a score of 50% needed to be achieved to be classified as having good knowledge. This percentage was selected based on it being the university-recognised 2nd classification grade.

Results

Demographics

SENCOs were recruited from across the East Midlands, West Midlands and Warwickshire areas. The median length of time employed as a SENCO was 5 years. The median time each week designated to the SENCO role was 2 days. Length of time employed as a SENCO did not influence the likelihood of having received training. Similarly, the length of time employed in the role did not influence the likelihood of a SENCO rating their school as being sensory-friendly.

Statistical significance

There was a significant chi-squared correlation between those that had received training and those that stated they did not know or made guesses about what the vestibular and proprioceptive senses are important for ($1, n = 22$) = 0.011 $p > 0.05$. There was a correlation between those that had received training and those that have supported a student with a sensory strategy timetable (1,

$n = 22$) = 0.021 $p > 0.05$. Additionally, there was a correlation between those that had received training and those that had good knowledge of the signs of sensory hyper-responsivity (1, $n = 22$) = 0.011 $p > 0.05$. There was no statistical significance of knowledge on hypo-responsivity. An additional finding was a significant chi-squared correlation between those that rated their school as sensory-friendly and those who correctly know what sensory integration is important for (1, $n = 25$) = 0.004 $p > 0.05$.

Knowledge and confidence

Sixty per cent of the participants selected ‘I know some things but there are gaps in my knowledge’. Most teachers reported they are confident to support a pupil with a sensory strategy timetable. There is no correlation between assumed higher levels of knowledge and greater confidence to implement a sensory strategy timetable. Forty per cent had received training on sensory processing. This was from a range of professionals and organisations with the majority being occupational therapists (9/22 participants) and specialist teachers (8/22 participants).

SENCOs who rated their school as being sensory-friendly had a greater understanding of what sensory integration is important for. Pertinently, those who rated their school as being ‘sensory-friendly’ (45.5%) were 8.5 times more likely to know sensory integration is needed for self-regulation. This group was four times more likely to know sensory integration is needed for developing social skills and six times more likely to know it is needed for physical movement. They were 3.5 times more likely to know it is needed for learning to read and write.

There was a high level of knowledge (98%) that any child can have sensory processing difficulties; not only those with autism. There was a significantly greater understanding of the tactile system compared to the vestibular and proprioceptive systems. Knowledge of these two sensory systems and sensory-based dyspraxia is poor: 36.4% correctly identified what vestibular feedback is important for; 32.7% correctly identified what proprioceptive feedback is important for; 36% knew dyspraxia can be due to sensory processing difficulties.

Discussion

The findings of this study raise interesting questions about the current knowledge of SENCOs and the methods in which therapists and schools collaborate

to achieve inclusive education for pupils with additional needs in the mainstream education setting. The findings suggest a considerable amount of the training delivered to schools on sensory integration is not facilitated by a sensory integration trained therapist but by specialist teachers. This could lead to difficulties distinguishing the differences between hypo-responsivity, hyper-responsivity, and sensory seeking behaviours. Furthermore, understanding sensory discrimination and praxis requires a greater level of knowledge and understanding of the integration of all eight senses. A factor influencing this could be a lack of understanding of the complexity of sensory processing; therapists need to complete postgraduate training in order to assess for and treat sensory integration difficulties. Knowing where to access a sensory integration trained therapist and what level of qualification is needed for a practitioner to have this status may be an additional barrier. Sensory integration is not routinely offered by all NHS paediatric therapy teams. Furthermore, financial constraints and the need for in-service training to upskill staff teams are likely to be significant. This may be a contributory factor for why training did not correlate to increased knowledge and why knowledge was poor in the more complex areas of sensory processing including the vestibular and proprioceptive senses and, sensory-based dyspraxia.

In 2009, it became mandatory for SENCOs to complete a postgraduate national qualification within three years of taking up the position (Esposito and Carroll, 2009). This implies recognition of the importance of SENCOs having additional knowledge on how to support pupils with additional learning needs. Ahn *et al.* (2004) conducted a study of parent perception and concluded 13.7% of mainstream school children met the criteria for a sensory processing disorder. Sensory diets administered during the school day have been found to improve activity level, engagement and prosocial behaviours (Lin *et al.*, 2012; Pingale *et al.*, 2019). Joint working with teachers has been found to be essential due to the valuable insights they can provide with the successful implementation of a sensory strategy timetable for ASD students (Mills and Chapparo, 2018).

The SENCOs rating of the school as being sensory-friendly positively correlated to increased knowledge of what sensory integration is important for. A possible explanation for this may be due to staff having attended other or additional training that covered some aspects. The importance of the sensory environment and the impact on engagement and learning is covered in some ADHD, attachment and autism training programmes. Higher levels of knowledge and greater confidence to implement a sensory strategy timetable did not correlate. It is hypothesised this could be due to

the Aristotle theory ‘the more you learn the less you know.’ There is the potential for those that have learnt more about sensory integration to have increased awareness of the complexity and therefore, confidence is not increased.

Those who had received training had greater knowledge on the signs of sensory hyper-responsivity, but this was not the same for hypo-responsivity. Children displaying behaviours due to hyper-responsivity can be labelled with behavioural problems due to over-activation of the nervous system. Hypo-responsivity is commonly not identified as easily as hyper-responsivity and these children can be labelled as withdrawn or lazy (Miller *et al.*, 2007). Correct survey responses for hypo-responsivity included constant fidgeting, difficulties maintaining balance, frequently falling over and not noticing when face or hands are dirty. For all of these behaviours, it is easy to identify alternative explanations. A number of the behavioural signs included in the survey can indicate both hypo and hyper-responsivity. A qualified therapist will analyse a wide range of data sources and identify clusters of behaviour in order to generate a hypothesis as to why the child is displaying specific behaviours. However, actions such as covering the ears in response to loud noise are clearly indicative of hyper-responsivity. Furthermore, behaviours such as covering the ears, being easily distracted, showing distress at an accidental touch or not wanting to engage in messy play activities are likely to be covered in the sensory component of autism and attachment training programmes.

In 2017, an evaluation of the effectiveness of the SENCO qualification was completed. Recommendations were made for specialist modules to be made available dependent on the trainee’s previous experiences and current setting, the embedding of opportunities within the programme for SENCOs to network with external agencies and for the government to provide funding for SENCOs to stay up to date with guidance on interventions to support pupils (Passy *et al.*, 2017). Subsequently, it is recommended sensory integration awareness training, including why and how to utilise sensory strategies, is encompassed in the SENCO national qualification. This should be delivered by therapists with postgraduate training. A further recommendation to improve inclusive education is to introduce collaboration between teaching and allied health professional students.

Barriers to collaborative working between teachers and therapists have been widely researched. The barriers identified include a lack of understanding of each other’s roles and therapists giving ‘expert recommendations’ but teachers not having a good understanding of the purpose and therapists not showing consideration for how these fit within the setting and a lack of ongoing support (Bose and Hinojosa, 2008; Hutton, 2009; Villeneuve, 2009; Truong and

Hodgetts, 2017). Recommendations to improve this include pre-service collaborative training and in-service training to increase professional socialisation, to reduce tensions in OT-teacher collaborations (Wintle *et al.*, 2017). A pilot study conducted by Farrand *et al.* (2019) introduces a collaborative design model for student teachers and occupational therapists as a way to meet the needs of children with increasingly complex needs in schools and to increase professional self-efficacy. The results of this study indicate greater collaboration is needed between therapists and teachers to increase the understanding of sensory integration and the impact of this on a child's education and well-being at school. Sensory strategy programmes need to be written with teaching staff and not given by the therapist in an 'expert' role. As a part of this process, a short training session is recommended to aid understanding of why the sensory strategies are being put in place with ongoing follow up support sessions. This study highlights there is large variability and gaps in SENCOs knowledge of sensory integration.

It was not possible to calculate a response rate due to the distribution methods used, this is a limitation of the study that impacts on the results being generalised. A second limitation is the respondents are from one area of England and, therefore, the results are not generalisable to the whole of the UK. This study was designed to provide statistics on the current knowledge level. A follow up qualitative study would be useful to consider the narrative of SENCOs to add further meaning to the points raised in the discussion.

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Correspondence

Jenny Quinn
Children's Sensory Therapy
The Old Post Office
20 Main Street
Aslockton
Nottingham
NG13 9AL
UK
Email: jenny@childrensensorytherapy.co.uk