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Sensory Integration Strategies for Handwriting among Autistic Children

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Abstract

Children with neurological deficits such as Autism, Attention Deficit Hyperactivity Disorder (ADHD), Developmental Coordination Disorder (DCD), Developmental Delay have difficulties in sensory integration and praxis deficits causing problems in reading writing, copying from the blackboard, listening and understanding instructions in the classroom. According to Ayres research [1] children with learning and language difficulties had short duration Post Rotatory Nystagmus. These findings suggest that functioning of Vestibular Nuclei is directly linked with reading and writing aspects skills. The blog post is based on is hands-on, sensory strategies that can be explored to improve childrens fine and gross motor skills and support his handwriting problems with modifications within environment and adaptations of academic utilities.

Keywords: Sensory Integration; Handwriting; Pediatric

Introduction

The handwriting is an important functional task for school-aged children and the primary way to express thoughts, ideas and knowledge, and emotions. Composing stories, expressing own emotions, copying numbers, from the black board, completing school assignments, writing formal letters, or applications all needs precise handwriting skill.

Children with neurological deficits such as Autism, Attention Deficit Hyperactivity Disorder (ADHD), Developmental Coordination Disorder (DCD), Developmental Delay have difficulties in sensory integration and praxis deficits causing problems in reading writing, copying from the blackboard, listening and understanding instructions in the classroom. Minimal to moderate noise, an odour of different environmental objects, visual sensitivities towards fluorescent light are some of the examples that do not bother a typically developing child while working or sleeping.

This happens since child's body "tunes itself automatically" and gets adapted to environmental demands. However, in an atypically developing child "tuning" component does not work well, causing the child to struggle at each step and every moment since his body has to "tune itself manually" to get adapted to environmental demands. According to Case-smith [2], children began to draw and scribble on paper as soon as they are able to grasp a writing tool. The development of writing process in early years includes scribbling, drawing lines and circles. As the children grow to 5-7 years of age they develop fine motor skills such as jumping, skipping, playing with marbles and hopscotch.

During 7-8 years they learn to use the different functional tool such as knife and fork, scissors, pencils, zippers, buttons, brooms. They learn to plan and sequence actions which are an important part of motor planning. Developing ideas, for building blocks, construction toys, Legos, sand castles, are taken enthusiastically. All these experiences of childhood enable a developing brain to work efficiently and organise incoming sensory information received from different sense organs.

Writing is a complex process that requires synthesis and integration of different sensory systems such as tactile (touch, feeling the paper surface), proprioception (joint position sense, force needed to hold pencil, writing on the paper), vestibular (coordinating both sides of body) and visual motor skills along with visual-spatial abilities for initiating legible handwriting. Recent studies have predicted that children with Autism Spectrum Disorder often have poor hand legibility which affects their academic performance [3]. A child with Autism Spectrum disorder or Dyspraxia can have handwriting difficulties while copying letters from the blackboard, drawing pictures, solving maths problems or during touch typing.

Using extremely too much or too less force while writing or holding the pencil, following right to left approach, in abilities to cross the midline are some of the common difficulties faced by children while writing. According to Ayres research [1] children with learning and language difficulties had short duration Post Rotatory Nystagmus. These findings suggest that functioning of Vestibular Nuclie is directly linked with reading and writing aspects skills. According to recent publication Hand Strength, Handwriting, and Functional Skills in Children with Autism (2015), children with Autism demonstrate same developmental trends in strength as typically developing children for grip and pinch strength can be positively co-related to pencil control for handwriting and functional skills in typically growing children. As the ASD children grow they need different strategies to improve grip strength for handwriting control.

However, for an atypically growing child these opportunities and playful scenarios are sensory challenges. They may experience stress in a case in course of day to day tasks related to fine motor, gross motor and handwriting skills. These children are reluctant to write, easily tired, seen slouching in their chair, their desk is often disorganised, may drop things in hand and may display behavioural issues due to frustration, the anger of not being able to accomplish tasks in hand and other sensory difficulties.

Following are hands-on, sensory strategies that can be explored to improve child's fine and gross motor skills and support his handwriting problems with modifications within environment and adaptations of academic utilities. It should be remembered that every child different and unique in his needs and behaviours, therefore understanding child's priorities and behaviour is significantly important before implementing these suggestions.

Proprioception Sense Issues and Strategies

Proprioceptive awareness allows the child to where he is. It detects the muscles acting on the joints and provides a sense of position and movement. Children with poor proprioception may also have poor planning and sequencing skills. The proprioceptive-vestibular system work together to support child to enhance muscle tone, reduce fatigue level and coordinate both the sides of body.

A. May lack judgement about the amount of pressure needed to exert on paper.

B. May drop things in hand and look weak.

C. May erase so hard which may cause holes in sheet due to poor modulation issues.

D. May use the least pressure while writing on paper due to which writing is illegible

E. May get tired easily or tend to slump over the desk.

F. May avoid extended hours of sitting and writing

G. May complaint about pain in his hand, arm and neck if writing for prolonged hours.

H. May have a poor grip on pencil due to poor modulation.

Proprioceptive Sensory Strategies

a) Fidgets help to reduce fidgeting, anxiety or impulsivity.

b) Thera-bands are a good source of strengthening hand and wrist muscles and providing resistive exercises.

c) To improve tension forearms, forearms and hands give a gentle clasp.

d) Stress ball helps in strengthening hand muscles and reduces anxiety.

e) Movement breaks: 2-3 minutes of break can increase the efficacy and concentration by 15-20 minutes. Scheduled movement break is important may be once or twice a day.

f) Plastic bendable pencils can be used for children who likes chewing pencil tops for oral stimulation.

g) Use HB Pencil for if the child writes too light and the marks are not legible.

h) Use Soft lead 2B pencils if the child writes too hard leaving holes in paper.

i) Clutch Pencil (0.7 mm) helps to strengthen thumb muscles. Both propelling and clutch pencils are more efficient than wooden pencils as the child doesn't have to waste time sharpening pencils.

j) Use CLAW pencil grip to eliminate thumb wrap and fist grips.

k) Use paper towel under the sheet if child presses too hard while writing or creates holes.

l) Wrap clay around the pencil and ask the child to maintain the shape of clay. Shape distortion means he is using too much of force while writing.

Posture: Ergonomics for Seating

1) While sitting on chair hips, knees, and ankle should be perpendicular to each other.

2) Back should be straight and ninety-degree angle should form at an elbow.

3) Wrists should be in resting position.

4) Table and chair should have appropriate height.

5) The seat back should be angled at 15 degrees.

6) The child should lean forward with body weight supported by the floor with feet on the ground.

7) Provide slanting desk or tilt table desktop for achieving ideal reading and writing angles for vision and spine.

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8) Elbow rests prevent straining of shoulders and neck muscles.

9) Reading angle should be about 60 degrees from horizontal.

10) Writing angle should be about 10-20 degrees.

Vestibular Sense Issues & Strategies

This sense is called as vestibular sense. Our relationship to parents can be called secondary when explaining importance and relation to gravity in our lives. Due to this sense essential skills such as bilateral integration, eye-hand coordination and balance are accomplished during child's growth and development. Proprioceptive-vestibular system works in concert with visual system and allows the child to orient in space and perceive 3-dimenasional space. Many children with a poor processing of vestibular system have difficulties in controlling their eye movements when moving from one spatial plane to another. This the reason these children get easily fatigued while studying or doing any sedentary activities. Their postural control and postural stability are usually poor causing difficulties maintaining balance and coordination.

A The child may have difficulties in coordinating both the sides of the body that is left and right side confusion will be prominent.

B May get easily confused with instructions or directions that's why they easily forget classroom routes.

C May have difficulties in dancing, playing the drum, eating with knife and fork as hands and feet may not work in coordination.

D May be ambidextrous or have poor hand preference.

E May have trouble with maths.

F May have disorganised desk, room and surroundings

Bilateral Coordination

Ability to use both sides of the body simultaneously and independently is called as bilateral coordination skill. Usually, children with poor vestibular sense have poor bilateral integration. Some of the features are mentioned above. Following strategies can be helpful for improving Bilateral Coordination skills.

a Involve child in activities such as bike riding, football playing, throwing a ball, skating, horse riding, swimming.

b Playing musical instruments improves bilateral coordination.

c Target games

d Play nut-bolt games with the child for improving fine motor skills.

e Hitting ball with rolling pin or rolled up newspaper

f Cutting with scissors - large shapes then smaller followed with angular ones

g Climbing frames, tug of war.

h Star Jumps, Hopping

Visual-Auditory Processing issues & strategies

A May have difficulties in forming or staying in line when drawing, colouring or painting.

B May have difficulties in cutting along the lines or glueing properly.

C May have difficulties in placing cut-outs in the correct place in crafts project.

D May be sensitive and easily distracted to noise, visual stimuli or background sounds.

E May look confused often.

F May loose page while reading writing, copying

Auditory-visual strategies

a Drawing shapes, patterns, letters, numbers in different types of medium such as sand, playdoh, shaving form etc.

b Let child start with horizontal

c Encourage maze games.

d Reduce too much of visual stimulation.

e Construction toys, building blocks, Lego can support

Tactile Issues & Strategies

A May dislike being touched or approached from behind.

B May dislike getting hands messy in finger paint, glue and shaving form.

C May seem distressed when having nail cutting or toenail cutting.

D May chew pencil, shirt collar, hair or rubber while writing or reading in the classroom or home.

E Maybe a sensory seeker and have a tendency to touch everyone and everything.

Tactile Strategies

a Inform child before touching him.

b Try painting or messy activities in the vertical plane first.

c Try plastic bendable pencils for chewing purpose and oral stimulation.

Olfactory Issues and Strategies

The child may be distracted by different smells in a classroom such as deodorants, perfumes etc. Sometimes olfactory (smelling

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sense) sensitivities can be possible cause of limited sleep such as odours come from perfumes, deodorants of adults, toilet, food, cosmetics, or any household items. It is important to identify and realise that atypical child is slightly different from other children and therefore he needs special attention and care in areas which have minimal or no relevance for others.

Olfactory Strategies

a Use unscented shampoos and detergents.

b Avoid cooking when a child is studying

c To avoid allergies, wash beddings frequently in hot water.

d Vacuum clean child's room regularly to avoid bad odours.

Conclusion

In conclusion, sensory-rich environment and sensory strategies support in establishing handwriting skills in children with sensory processing difficulties to a great extent. Adaptations to facilitate learning and changes in the educational environment are important facets to make students successful in academics.

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