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Is Sensory Integration & Praxis Test Useful in India? Single Parameter Index Analysis in an Indian Set Up

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Abstract

Introduction: Integration of various senses is a function of childhood development. Subtle problems in these areas of development leads to many problems in children and adult life including learning and emotional problems. Currently, these can be measured reliably and thus, remedied; leading to satisfactory resolution, if intervened early. Sensory Integration & Praxis Test (SIPT) is one such tool.

Aim: Study utility of SIPT in Indian setting to consider its widespread applicability.

Objective: Analyse one Indian set up having certified SIPT professionals using single parameter as index of utility for a defined period.

Methods: Retrospective analysis of SIPT tests in 2019 calendar year was conducted from one Child Development Centre at Kolkata. All Sensory Skill sub-sets of SIPT that were deficient beyond two Standard Deviations (SD) on the test were collated. This was analysed to see, if the data for significant deficiencies were useful in planning remediation for Sensory Dysfunctions identified.

Results: 17 areas of Sensory Functions were deficient in this cohort of 314 children with complaints suggestive of NDDs (below 2 SDs). 11 out of 17 sub-scales of SIPT scored, demonstrated deviation below 2SDs in more than half (>50%) subjects studied.

Conclusion: SIPT seems to be useful in Indian setting to plan multidisciplinary management for children with special needs. Larger studies involving other centres and involving deeper analysis of the SIPT scores can guide professionals to target their intervention better using upcoming precise tools like SIPT.

Keywords: Sensory Integration; Sensory Processing; Sensory Dysfunction; Special Needs; Learning Problems; Neurodevelopmental Disorders; Child Development Centre

Introduction

Learning1,2, behavioural and emotional disorders3,4 are 3-10% in India. In a study conducted in Chandigarh in 2017, it was found that 1.58 per cent of 12 to 18 year old school students, were specific learning disability5. Considering India's population of 1.38 billion in 2015 with about 0.65 billion under 14 years of age6, we are looking at 20 to 65 million affected children at least, who can benefit from the latest technologies to help them.

One of the underlying causes of their suffering remains their Sensory Processing difficulties7. Sensory Processing Skill Set is a set of childhood developmental functions, which like most other developmental skill sets, is amenable to accurate and targeted intervention8.

Sensory Integration & Praxis Test [SIPT] is a standardized9 tool of measurement of Sensory

difficulties10, leading to secondary difficulties like learning or emotional difficulties.

Since the training and accreditation of SIPT has become available in India, healthcare units like Child Developmental Centres now have trained and accredited professionals, who are in a position to unearth such maladies, which can easily escape the naked eye.

A retrospective analysis of available records from 2019 at one Indian Child Development Centre at Kolkata, that has three SIPT trained and accredited professionals, was conducted to see, if SIPT has utility in Indian setting, so that it can be widely applicable for more accurate pick-ups for remediation.

Aim

Aim is to conduct a short and retrospective study with the available SIPT reports to see, if SIPT is picking up Sensory Processing Disorders in children in India, using one Child Development Centre [CDC], where SIPT assessment is part of routine assessments in children presenting with suspected neurodevelopmental disorders [NDD], who are thought to have Sensory Dysfunction.

Objectives

SIPT identifies Sensory Processing Disorders by measuring 17 sub-scales of Sensory Processing development in a standardized manner. Two standard deviations below each sub-scale is considered to be Disorder in that area of Sensory Processing Skill.

This study identified, where in children living in India, presenting to CDC with diverse complaints with probable underlying NDD(s), these sub-scales are disordered viz. below 2SDs.

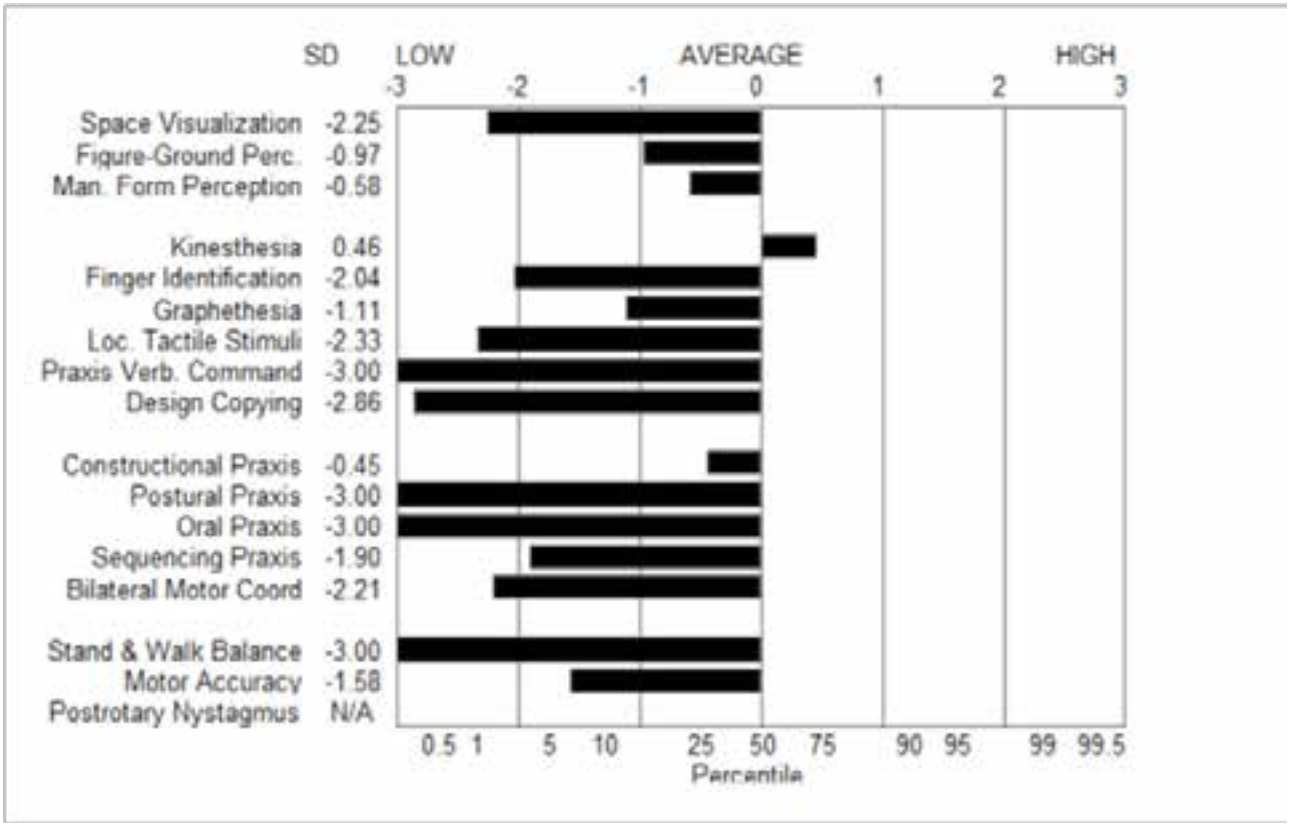
This is considered as an index of utility of SIPT in India, which could call for more widespread studies using similar and more diverse criteria to establish any need for its applicability. The postulate is that, if we know where SIPT helps children of India, we can refine and standardize an useful tool for more precise pick-ups and thereby improving opportunities of improved and better targeted interventions.

Methods

Available SIPT reports from the calendar year 2019 were collated and anonymised. Areas of deviations below 2SDs in each of the 17 subscales were identified. Data thus obtained, were then analysed to identify any pattern that has clinical utility for targeting remediation. Analysis was done by a qualified Developmental Paediatrician of Good Standing. SIPT evaluations were conducted and reports were generated by qualified (meeting SIPT qualifications standard C) and accredited consultant therapist. Assessor and Analysts did not confer to avoid one influencing the other.

Results

One example of SIPT report shows sub-scales in one page for appreciation



The following table shows the data collated from available reports of SIPT during 2019 at Kolkata CDC:

Total available SIPT reports at CDC. Kolkata in the calendar year 2019	314
Number of SIPT sub-scales <2SDs	
Space visualization	256 (81.5%)
Figure-Ground Perception	104 (33%)
Recognition of forms held in hands: Stereognosis (Manual Form Perception)	66 (21%)
Somatic Perception of Arm Position and Movement: Kinesthesia	111 (35%)
Tactile Perception of Individual Fingers: Finger Identification	132 (42%)
Tactile Perception of Single Designs: Praxis (Graphesthesia)	221 (70%)
Identification of Place on Arm or Hand Touched: Local Tactile Stimuli	183 (58%)
Translation of Verbal Directions into Actions: Praxis on Verbal Command	304 (97%)
Design Copying: Visual Praxis	299 (95%)
Three-Dimensional Visual Space Management: Constructional Praxis	52 (16.5%)
Planning and Executing Bodily Movements: Postural Praxis	287 (91.5%)
Imitating tongue/lip/jaw movements: Somatopraxis (Oral Praxis)	307 (97.7%)
Sequencing Praxis: Bilateral Integration to sequence movements	213 (68%)

Bilateral Motor Coordination	256 (81.5%)
Standing and Walking Balance	270 (86%)
Motor Accuracy	301 (95.8%)
Post-rotatory Nystagmus (CNS processing of vestibular input)	Separately done

Discussions

SIPT unearths many reasons behind a child's failure. Although the test was originally designed for children aged 4 to 9 years (8 year 11 months), SIPT is used beyond that age range worldwide now (albeit non-standard) even in adults (16 March, 2018) since it is increasingly felt that many people have missed out this ability to pinpoint real origin of a person's failures in life to target remediation, as far as possible.

Simply looking at one index in one centre in India, where children thought to have Special Needs (often Neurodevelopmental Disorders) largely present, it is obvious that so many of them actually have difficulties in their Sensory Development.

11 out of 17 sub-scales of SIPT scored, demonstrated deviation below 2SDs in more than half (>50%) subjects studied.

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First Table showing items where >50% caseloads show disorders, whereas the Second Table shows <50% affected.

It can therefore, be concluded that SIPT unearths significant under-recognized maladies in children with Special Needs and NDDs. Moreover, if this is the state of affairs identified in a single centre in India, how many children might be going either unrecognized or sub-optimally appreciated about their extent of primary biological issues. There are however, major limitations of this study that should be bourne in mind before generalizing the results.

Some of the limitation of this study involves (a) single centre, (b) only 2SD below data were utilized, (c) clinical correlates were missing, (d)

2SD above abnormalities (?Savants) were ignored (e) post-rotatory nystagmus is not measured as part of SIPT assessment in this centre (although, it is measured separately in Visuo-perceptual Assessments at this centre quite regularly) (f) absence of reference for using 50% cases as something of significance etc.

Nonetheless, this study unambiguously highlights the possibilities that closer and more scientific look at the underlying causes of functional failures in children of India in their life, particularly learning, behaviour and their emotions, definitely have potential to improved understanding of scientific fact behind their origins.

Since accurate targeting of therapeutic plans show to improve the subject's life chances multifold11 (topic of another study), it can be argued that precision standardized detection tools ought to be used more universally in evaluation of children of India with Special Needs.

Conclusions

SIPT is a useful tool in evaluation of children with Special Needs/NDDs

What is already known on the subject?	*What does this study add?*
SIPT is a useful tool to measure Sensory Integration and Praxis related difficulties in children	1. SIPT is useful in Indian setting 2. There is potential to use it more widely for improved outcome

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