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Assessing Sensory Sensitivity and Behavioural Feeding Problems among children with Developmental Disabilities: A Pilot Study

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ABSTRACT

Introduction: Developmental disabilities prevalence appears to be significant worldwide. Sensory sensitivity has also been associated with behavioural feeding problems among children with developmental disabilities. **Objectives:** To assess & seek a relationship between sensory sensitivity & behavioural feeding problems among children with developmental disabilities and to seek an association between sensory sensitivity & behavioural feeding problems among developmentally disabled children with selected factors. **Research methodology:** The study used a descriptive survey research design including 50 children aged 6 - 11 years diagnosed with ASD, ADHD, Intellectual Disability, Cerebral Palsy, Specific Language Disability and Down syndrome attending Child Guidance Centre OT4 Kids, selected via purposive sampling technique. **Down Syndrome** Data collected through structured interviews, anthropometric measurements, and standardized tools i.e. Parent completed Glasgow Sensory Questionnaire and Behavioural Paediatric Feeding Assessment to assess sensory sensitivity and behavioural feeding problems. **Result:** Children with developmental disabilities had higher sensory sensitivity scores in cerebral palsy while Autism, ADHD, Intellectual Disability and Down syndrome have similar mean scores. The study found a significant positive correlation (p= 0.011) between hyposensitivity score and behavior pediatric feeding frequency and (p=0.03) problem score among children with developmental disabilities. **Conclusion:** Problematic parental feeding strategies along with behavioural feeding problems among children with developmental disabilities are associated with sensory hyper & hypo sensitivities found in these vulnerable populations**.**

Key words: Developmental disabilities, sensory sensitivity, behavioural feeding problems, Autism Spectrum Disorder (ASD), Attention Deficit Hyperactivity Disorder (ADHD), Cerebral Palsy, Specific Language Disability, Intellectual Disability, and Down syndrome

Introduction

Human development refers to the physical, cognitive, and psychosocial changes occurring throughout the lifespan. Developmental disabilities prevalence appears to be significant worldwide. Examples of more common developmental disabilities include, attention deficit/hyperactivity disorder (ADHD), Specific language disability (SLD), autism spectrum disorder (ASD), intellectual disability (ID), and other developmental delay. nearly 240 million children with disabilities in the world.[1] In most of the databases, Sub-Saharan Africa and South Asia accounted for more than half of children with disabilities.[2] In India, almost one in eight children of the age 2–9 years have at least one of the nine neuro-developmental disorders; this is a conservative estimate, and actual burden might be higher due to limitations of the study.[3] Sensory sensitivity refers to the internal sensory experience of a child covering seven sensory modalities, such as vision, auditory, olfactory, gestation, tactile, proprioception and vestibular.

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Hypersensitivity refers to an excessive or heightened response of a child to sensory stimuli resulting in sensory avoiding behaviour whereas hyposensitivity refers to a child's reduced responsiveness or decreased sensitivity to sensory input resulting in sensory seeking behaviour sensory processing challenges may exist independently, co-morbidly, or as part of a larger overarching diagnosis. Among children without disabilities, the prevalence of Sensory Problems ranges from 10% to 55%. The range for children with disabilities is estimated at 40%-88%.[4] The most common feeding behavioural problems in childhood are refusal to eat, eating too little, choosing food, and inappropriate behaviour at mealtimes, and the prevalence is 25%-40% in healthy children, while it can increase up to 80% in children with neuro developmental disorders.[5] Sensory sensitivity is linked to feeding problems in clinical samples by investigating how these factors interact and contribute to feeding challenges can provide valuable insights into the underlying mechanisms affecting feeding behaviours in children with developmental disabilities.

Need of the Study: Sensory sensitivities and behavioural feeding problems are viewed as a distinct disorder or as a complex of symptoms embedded in a larger neuro-developmental disorder, the primary responsibility of the nurse is to minimize the impact of these differences on the social, emotional, and behavioural development of the child by early identification and treatment referral.

Therefore, there is a need for a study to assess sensory sensitivity and behavioural feeding problems among children with developmental disabilities to further understand the specific sensory processes that impact feeding difficulties in this population. This study would contribute to the development of targeted early interventions to address these feeding problems and improve the overall well-being of children with developmental disabilities.

Statement of the Problem: A pilot study to assess sensory sensitivity and behavioural feeding problems among children with developmental disabilities attending Child Guidance Centre OT4 Kids, New Delhi.

Methodology

Research setting: This study conducted in Child Guidance Centre OT4 Kids, New Delhi. The location was chosen based on three factors: proximity to one another geographically, study feasibility, and sample availability.

***Variables Under Study Are*:**

Dependent variables: In the present study, the dependent variables are **sensory sensitivity & behavioural feeding problems** among children with development disabilities

Independent variables: independent variable is **developmental disabilities** among children.

Demographic variables: age, sex, mode of delivery at birth, birth order, birth weight, number of siblings, type of family, socio-economic status, maternal education, maternal occupation, nutritional status, diagnosis of child, duration of treatment, age of diagnosis.

Population: children with developmental disabilities i.e., diagnosed with autism spectrum disorder, cerebral palsy, specific language disability, Attention Deficit Hyperactivity Disorder, intellectual disability & down syndromeattending Child Development Centre of Safdarjung hospital.

Sample and sample size: Sample of the present study population consisted of **children with developmental disabilities between the age group of 6 years to 11 years attending Child Development Centre of Safdarjung hospital. The sample size of this study is 150** children with developmental disabilities attending child development centre of Safdarjung Hospital, New Delhi.

Sampling technique: For the present study **non probability purposive sampling technique** was used for selecting the children in the range of 6 to 11 years of age and their parents.

Inclusion criteria: Children with age group 6 years – 11 years attending Child Guidance Centre OT4 Kids.

- Children diagnosed with autism spectrum disorder, cerebral palsy, specific language disability, ADHD, intellectual disability & Down syndrome.
- Parents of children who are willing to participate.

Exclusion criteria: Parents of children who do not understand Hindi & English.

Tool For Data Collection: The investigator prepared the structured interview schedule in order to collect the socio demographic variables. Two Standardized rating scales were used: Parent completed Glasgow sensory questionnaire & Behavioural Pediatrics Feeding Assessment for assessing sensory sensitivity & behavioural feeding problems among children with developmental disabilities.

Development and Description of the tool

SECTION-I: Demographic structured interview schedule & anthropometric measurement

(a) ***Identification Data:*** It contains 16 items which ascertain information regarding Child code no., age of the child, sex of the child, mode of delivery at birth, birth order, birth weight, number of siblings, type of family, education of the head of the family, occupation of the head of the family, total family income, maternal education, maternal occupation, nutritional status, diagnosis of child, duration of treatment, age of diagnosis.

(b) ***Anthropometric measurements:*** It includes measurement of height & weight of the children. Nutritional status of children with developmental disabilities according to BMI for age categories was assessed by IAP Growth chart application software (2014) based on WHO growth standards.

SECTION- II: Parent completed Glasgow Sensory questionnaire- The GSQ-P is our 42-item parent-report questionnaire, assessing sensory sensitivities reported scoring system that ranges from 0 to 168, where higher scores indicate greater sensory sensitivityin the children of respondents. Half of the items addressed hypersensitivity and half addressed hyposensitivitythat ranges from 0-84 across seven sensory modalities. These items were equally distributed across seven sense subscales (visual, auditory, gustatory, olfactory, tactile, vestibular, proprioception) giving three questions per cell (e.g., 3 questions for visual hypersensitivity, 3 questions for visual hyposensitivity, 3 questions for auditory hypersensitivity, etc.). Each question had five possible responses: Never, Rarely, Sometimes, Often, Always (coded 0 to 4).

SECTION- III: Behaviour Pediatric Feeding Assessment - The BPFAS is a comprehensive and widely used measure of behavioural and skill-based feeding problems. The 25-item parent-report BPFAS was used to assess child mealtime behaviours, child's feeding patterns and mealtimes at home are also explored. For each one of the 25 questions the (child frequency score), parents were requested to answer how often a named behaviour is observed (on a five-point scale from 1-never to 5-always). The score more than 61 represents the presence of behavioural feeding problems among children.

Results and Findings

SECTION 1: Findings Related To Description of Socio-Demographic Characteristics

The majority of children with developmental disabilities were male (60%) and fell within the age group of 6-7 years (80%). Most came from nuclear families (56%) and belonged to an upper-middle socioeconomic class (56%). In terms of birth characteristics, 42% of these children had a birth weight between 2kg-3kg, while 28% weighed less than 1kg, and 52% were born via caesarean section. The mothers of these children were predominantly homemakers (56%) and well-educated, with 68% having a graduate or postgraduate degree. Nearly half of the mothers were primi-gravida (48%), while 52% were multi gravida. Many children with developmental disabilities were either underweight or overweight (both 32%) and were diagnosed before the age of 2 years (78%). The most common diagnoses were autism (44%) and ADHD (22%), with fewer cases of

cerebral palsy (8%), specific language disorder (12%), intellectual disability (8%), and Down syndrome (6%). Sensory intervention programs were provided to 28% of the children between 7 months to 1 year, and a similar percentage between 1 to 2 years of age. Additionally, 66% of these children had only one sibling.

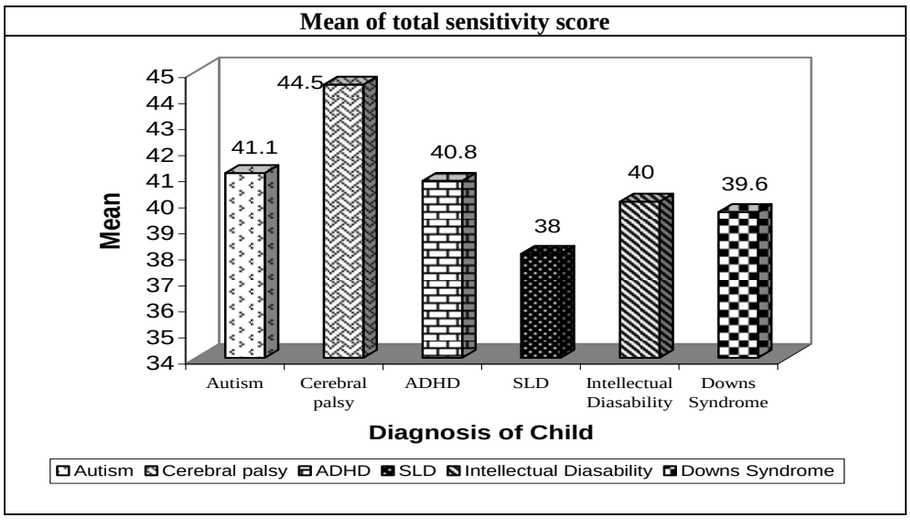
SECTION-2: Findings Related To Total Sensory Sensitivity, Sensory Hyper/Hypo Sensitivity & Behavioural Feeding Problem Among Children With Developmental Disabilities.

Table-1: Mean, Standard deviation of total sensitivity scores of children with developmental disabilities

Developmental Disabilities	Total Sensitivity Score	Hyper-Sensitivity Score	Hypo-Sensitivity Score
	Mean ± S. D.	**Mean ± S. D.**	**Mean ± S. D.**
Autism	41.1 ± 17.5	20.2 ± 9.6	20.9 ± 8.8
Cerebral palsy	44.5 ± 13.1	18.7 ± 3.8	25.7 ± 10.2
ADHD	40.8 ± 17.1	18.8 ± 7.3	22.0 ± 11.0
SLD	38.0 ± 16.7	20.1 ± 7.6	17.8 ± 10.1
Intellectual Disability	40.0 ± 14.6	17.7 ± 4.7	22.2 ± 10.8
Downs Syndrome	39.6 ± 12.0	21.6 ± 9.2	18.0 ± 3.0

The children with developmental disabilities had total sensory sensitivity score highest in children cerebral palsy, whereas it is lowest in children with SLD. Autism, ADHD, Intellectual Disability, and down syndrome fall within a similar range of mean scores, with Autism having a slightly lower mean score compared to Cerebral Palsy. The children with developmental disabilities had equivalent mean hypersensitive score and mean hypo sensitive score among children with autism. Whereas children with cerebral palsy & ADHD had more mean hypersensitive score than mean hyposensitive score. Whereas children with SLD & Downs syndrome had more mean hypersensitive scores. The children with intellectual disability had more mean hyposensitivity score than mean hypersensitivity score.

Fig.-1 : Bar diagram showing mean of total sensory sensitivity score of children with different developmental disabilities



Overall data also suggested that children diagnosed with autism (44.4%) had more behavioural feeding frequency significantly higher than normative mean as compared to other children diagnosed with Attention Deficit

Hyperactivity Disorder (18.50%), Cerebral palsy (11.10%), Specific Language Disorder (11.10%), Intellectual Disability (7.40%), Downs syndrome (7.40%).

SECTION-3: Findings related to relationship between total sensory, Hyper/Hypo Sensitivity Score and Behaviour Pediatric Feeding Frequency & Problem Score among Children with Developmental Disabilities

Table -2: Karl Pearson Coefficient of Correlation between Total Sensory, Hyper/Hypo Sensitivity Score and Behaviour Pediatric Feeding Frequency & Problem Score.

Variables	Mean ± SD	"r" value	P value (at 0.05 level of significance)
Total hypersensitivity score	19.68 ± 7.98	0.372	**0.050**
Total behaviour pediatric feeding frequency score	87.66 ± 20.17		
Total hypersensitivity score	19.68 ± 7.98	0.539	**0.037**
Total behaviour pediatric feeding problem score	7.08 ± 5.76		
Total hyposensitivity score	21.12 ± 9.35	0.758	0.011
Total behaviour pediatric feeding frequency score	87.66 ±20.17		
Total hyposensitivity score	21.12 ± 9.35	0.508	0.030
Total behaviour pediatric feeding problem score	7.08 ±5.76		
Total behaviour pediatric feeding frequency score	87.66 ±20.17	0.827	0.000
Total behaviour pediatric feeding problem score	7.08 ±5.76		

Total, hypersensitivity and hyposensitivity among children with developmental disabilities were having significant relationship as well as children with behavioural feeding frequency and problem reported by parents among children with developmental disabilities were having significant relationship.

Discussion

- ***Sensory Sensitivity (Total, Hypersensitivity & Hyposensitivity) And Behavioural Pediatric Feeding Problem Among Children With Developmental Disabilities***: All the children with developmental disabilities had sensory sensitivity whereas the children with ASD, ADHD and Intellectual Disability had higher sensory sensitivity in terms of total sensory sensitivity, sensory hypersensitivity & hyposensitivity and higher behavioural feeding problems compared to the children with Cerebral Palsy, Specific Language Disability and Down's Syndrome. The highest sensory sensitivity subscale was proprioception, tactile, vestibular are also declared same findings in their respective studies.[6,7,8,9,10,11, 12]
- ***Relationship between total/hyper/hypo sensory sensitivity among children with developmental disabilities and behavioural pediatric feeding problem:*** There was a significant moderate positive relationship between total sensory sensitivity among children with developmental disabilities and behavioural pediatric feeding problem. also concluded the same findings in their studies. [11, 13, 14]

Hence, present study finding is congruent to supporting studies.

Conclusion

It is concluded that higher sensory sensitivity is more likely to have behavioural pediatric feeding problems and problematic parental feeding strategies among children with developmental disabilities and The finding of the study also has several implications so that nursing services to be based on implementation of individualized specific assessment and regular screening for sensory profile & behavioural feeding problems among children with developmental disabilities in hospital and community settings.

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