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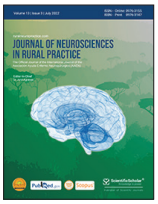

Original Article

Exploring behavioral pediatric feeding problems and parental perceptions among children with developmental disabilities

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ABSTRACT

Objectives: The objectives of the study are to assess and seek the association of behavioral pediatric feeding problems, parental problems, and strategies with selected variables among developmentally disabled children.

Materials and Methods: The study used a cross-sectional design including 150 children aged 6–11 years diagnosed with autism spectrum disorder (ASD), attention-deficit hyperactivity disorder (ADHD), intellectual disability, cerebral palsy, specific language disability, and Down syndrome in Child Developmental Center of Safdarjung hospital, selected through purposive sampling technique. Data were collected through structured interviews, anthropometric measurements, and behavioral pediatric feeding assessment.

Results: Mean behavioral feeding problem score and parent's pediatric feeding problem score were higher in children with ASD, ADHD, and intellectual disability. It was found that *P*-values for maternal occupation ($P = 0.027$), nutritional status ($P = 0.000$), and diagnosis of child ($P = 0.002$) were found to be statistically significant at 0.05 level of significance to seek the association between behavioral pediatric feeding problem among children with developmental disabilities and the selected variables, whereas the *P*-values for mode of delivery ($P = 0.016$), nutritional status ($P = 0.000$), diagnosis of child ($P = 0.003$), and socioeconomic status ($P = 0.050$) were found to be statistically significant at 0.05 level of significance to seek the association between parent's pediatric feeding problem and strategies among children with developmental disabilities and the selected variables.

Conclusion: Parental problems and their strategies may play a vital role in behavioral feeding problems among children with developmental disabilities which are further affected by various factors.

Keywords: Attention-deficit hyperactivity disorder, Autism spectrum disorder, Behavioral pediatric feeding problems, Developmental disabilities, Parental problems and strategies

INTRODUCTION

Development is the process by which a person changes physically, cognitively, and psychosocially throughout his/her life. Developmental disabilities are prevalent worldwide, with conditions such as autism spectrum disorder (ASD), Attention-deficit hyperactivity disorder (ADHD), intellectual disability (ID), specific language disability (SLD), and other developmental delays being common examples. Globally, nearly 240 million children live with disabilities, with Sub-Saharan Africa and South Asia representing more than half of this population.[1,2] The actual burden of neurodevelopmental disorders may be higher due to limitations in the studies. In India, approximately one in eight children between the ages of 2 and 9 suffer from at least one of the nine developmental disorders.[3]

Feeding is an essential activity that facilitates interaction between parent and child and plays a critical role in influencing the child's health. "Feeding behavior refers to the patterns of behavior at and around mealtimes, parental strategies, foods accepted and refused, refusal patterns such as whining and delaying, and behavior related to difficulty handling certain foods such as gagging."[4] The most common feeding behavior problems present in childhood include refusing to eat, eating too little, being selective about food, and acting inappropriately during mealtime. The prevalence of feeding difficulties is approximately

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30–90% among children with special needs, resulting in chronic malnutrition, decreased quality of life, and early death in children.[5] Food intake difficulties, self-feeding issues, oromotor skill deficits, or behavioral problems can cause these difficulties.[6] These problems are seen in 25–40% of healthy children, but the prevalence can rise to as much as 80% in children with neurodevelopmental disorders.[7] Research in India has also indicated that children with special needs who experience feeding challenges face a higher risk of malnutrition compared to typically developing children.[6] In children with neurodevelopmental challenges, disruptions in the typical progression of feeding skill development can lead to both temporary and lasting effects on behavior, sensory processing, psychological well-being, and nutritional health. A tactile oversensitivity, for instance, has been shown to influence children with and without atypical development in terms of their eating habits and food selection.[8] Consequently, there is a strain on the parent-child relationship during feeding, more coercive feeding strategies are used, the child's autonomy in feeding tasks is reduced, and the child's maladaptive feeding behavior persists.[9] A variety of environmental factors can also influence feeding skills, including family interactions during meals, particular feeding practices by the parents, and their level of knowledge regarding feeding.[10] Investigating feeding problems in clinical populations by examining how various factors interact and contribute to these challenges can offer valuable insights into the underlying mechanisms affecting feeding behaviors in children with developmental disabilities.

Need of the study

Defects in motor, intellectual, language, behavior, and/or sensory functioning are often present in children with special needs. Behavioral feeding problems may be treated as a distinct disorder or part of a larger neurodevelopmental disorder, so health professionals are responsible for identifying these differences early and referring children to treatment. A better understanding of information and strategies to support their children with developmental disabilities can be beneficial for parents and caregivers of children with developmental disabilities. The primary goal is to improve diagnoses and enhance intervention effectiveness by developing a holistic approach. Ultimately, this approach aims to improve the health and well-being of disabled children. Children with developmental disabilities and their families are likely to benefit significantly from the findings of this research.

Statement of the problem

"Exploring behavioral pediatric feeding problems and parental perceptions among children with developmental disabilities."

MATERIALS AND METHODS

After obtaining the administrative approval and ethical clearance from Rajkumari Amrit Kaur College of Nursing and the Ethical Review Board of Safdarjung Hospital, this cross-sectional study performed at the Child Development Center of Safdarjung Hospital, New Delhi, a specialized facility that focuses on assessing, diagnosing, and offering a variety of intervention services to children with developmental delays and disabilities that have been referred to it. Children between the age group of 6 years and 11 years were diagnosed with ASD, ADHD, ID, cerebral palsy, SLD, and Down syndrome attending the Child Development Center selected through purposive sampling technique. First, self-introduction and establishment of rapport with the subjects were done. All samples were selected using the purposive sampling method. Written consent was taken from the parents of each sample, who are willing to participate and confidentiality of the respondent was assured and maintained. Parents of children who do not understand Hindi and English were excluded.

We will begin by calculating the sample size for an infinite population and then adjust it to fit the desired population size. Given: Z = 1.960, P = 0.1 (prevalence of children with developmental disabilities in India = 10% by RBSK), M = 0.05.

Using Cochrane's sample size formula, S = Z2 × P × (1−P)/M ×M S= (1.960)2 × 0.1 × (1−0.1)/0.05 ×0.05 = 3.8416 × 0.25/0.0025 S = 138.

The sample size for the population is 138 by the Cochran formula; hence, 150 subjects were taken for the final study.

Tool for data collection

The tool for data collection was administered to children with developmental disabilities and their parents who accompanied them to the Child Development Center, Safdarjung Hospital or were interviewed there as per their availability. Before the administration of the tool, anthropometric measurements, i.e., height and weight of child were taken and calculated Nutritional status of children with developmental disabilities according to body mass index for age categories was assessed by Indian academy of pediatrics Growth chart application software (2014) based on the WHO growth standards.

The average time taken for anthropometric measurement and behavioral pediatric feeding assessment for each participant was 25–30 min. For content validity, tools were given to 15 experts from the different fields of medicine and nursing (child neurology, occupational therapy, psychology, pediatric neurosurgery, nutrition, child health nursing, mental health nursing, medical surgical nursing, and community health nursing). Try out of the tool was done on 10 sample subjects. As the behavioral pediatrics feeding assessment scale

(BPFAS) tool is a standardized scale, the reliability coefficient was found to be 0.88–0.91.[4]

Development and description of the tool

Section-I

The demographic structured interview schedule contains 16 items which ascertain information regarding child code number, age of the child, sex of the child, mode of delivery at birth, birth order, birth weight, number of siblings, type of family, education (head of the family), occupation (head of the family), family income, maternal education, maternal occupation, nutritional status, diagnosis of child, duration of treatment, and age of diagnosis. Anthropometric measurements include the height and weight of the children.

Section-II

Behavior pediatric feeding assessment - This is a comprehensive and widely used measure of behavioral and skill-based feeding problems. The 35-item parent-reported questionnaire was used to assess the child's mealtime behaviors, child's feeding patterns, and parental perceptions. Parents were asked to respond to each of the 25 questions about their child's feeding behavior, indicating how often specific behaviors occur on a five-point scale from 1 (never) to 5 (always). A score above 61 suggests the presence of behavioral feeding issues in the child. The first 25 questions focus on assessing the child's feeding behaviors, while the remaining 10 address parents' feelings about mealtimes, their child's feeding patterns, and strategies they use to manage potential issues. In addition, parents answer "yes" or "no" to each of the 35 questions on whether they find a certain behavior problematic. The total frequency score (TFS) (maximum score 175) and the total problem Score (TPS) (maximum score 35) are derived as a result. An individual with a TFS score of 84 and a TPS score of 9 is considered at risk for feeding problems.

Data was entered in Microsoft Excel 2016 and analyzed using SPSS-21 software for descriptive and inferential. Using mean and standard deviation, we described continuous variables. Frequency and percentages were used to describe categorical variables. We used Chi-square among categorical variables showing an association between behavioral pediatric feeding problem scores among children with developmental disabilities and selected variables.

RESULTS

Section 1: Findings related to description of sociodemographic characteristics

The majority (63.3%) of children with developmental disabilities were male and nearly half (48%) of the children were between the age group of 6 and 8 years. Nearly half (50.7%) of the children with developmental disabilities were from nuclear families whereas 36% of children belonged to families with upper lower socioeconomic class and 30% of children belonged to lower-middle-class families. 62% of the children with developmental disabilities had a birth weight above 2.5 kg, whereas 38% of children had a birth weight below 2.5 kg and nearly half (50%) of the children were born through vaginal institutional delivery. Over half (56%) of the mothers were homemakers and 40.7% were educated as a graduate or above. Nearly half (52.7%) of the children with developmental disabilities were born with a birth order of more than one whereas children who were born as first child were 47.3%. The majority (60%) of children with developmental disabilities were diagnosed before the age of 4 years and nearly half (48%) of the children were underweight. Children diagnosed with ASD were 21.3%, ADHD (18.7%), cerebral palsy (17.3%), specific language disorder (12.7%), ID (16%), and Down syndrome (14 %). Nearly half (48%) of the children received sensory intervention in less than a 6-month program given by the hospital/Child Guidance Center. Half (50%) of the children had no siblings whereas 21.3% of children had two siblings in the family.

Section 2: Findings related to behavioral pediatric feeding problems, parental feeding problems and parental feeding strategies and feelings among children with developmental disabilities.

The findings reveal that behavioral pediatric feeding problems were present in 47.3% (f = 71) of the children with developmental disabilities, 66.7% (f = 100) of parents had problematic strategies during mealtime, and 56% (f = 84) of parents considered feeding behavior of their children problematic. Children with ADHD (25.3%), ASD (23.9%), and ID (23.9%) had higher behavioral pediatric feeding problems compared to children with SLD (9.9%), Down's syndrome (8.5%), and cerebral palsy (8.5%). The mean and standard deviation of behavioral pediatric feeding problem scores among children with different developmental disabilities suggested that the majority of children with ID (66.62), ADHD (63.29), and ASD (58.59) had higher mean behavioral feeding problem scores compared to the children with Down's syndrome (54.33), SLD (57.11), and cerebral palsy (53.81) as shown in Table 1 and Table 2.

The frequency and percentage of most common behavioral feeding problems among children with developmental disabilities according to rank order and the findings reveal that with regard to behavioral pediatric feeding assessment score, leaving the table during meals (95.3%), prolonged meal durations exceeding 20 min (83.3%), and tantrums occurring at mealtimes (82%) were found to be the three most concerned behavioral feeding problems present in children with different developmental disabilities.

(scores above 61 indicate behavioral pediatric feeding problems, while scores 61 and below indicate no behavioral pediatric feeding problems, scores above 9 indicate the parent's pediatric feeding problem present, scores below 9 indicate no problem, scores above 20 indicate parental pediatric feeding strategies and feelings problematic, and scores below 20 indicate no problem).

Table 1: Frequency and percentage distribution of behavioral pediatric feeding problems and parental feeding problems and parental feeding strategies and feelings among children with developmental disabilities (*n*=150).

		Frequency	Percent
1.	Behavioral pediatric feeding problems not present	79	52.7
	Behavioral pediatric feeding problems present	71	47.3
2.	Parental pediatric feeding strategies and feelings not problematic	50	33.3
	Parental pediatric feeding strategies and feelings problematic	100	66.7
3.	The parent's pediatric feeding problem is not present	66	44.0
	Parent's pediatric feeding problems present	84	56.0

Section 3: Findings related to association of behavioral pediatric feeding problems, parental problems and parental feelings and strategies with selected variables.

Section 3A: Findings related to the association between behavioral pediatric feeding problems among children with developmental disabilities and selected variables as shown in Table 3.

Section 3B: Findings related to the association between parents' pediatric feeding problem score among children with developmental disabilities and selected variables.

The chi-square value was computed to seek the association between parent's pediatric feeding problem score among children with developmental disabilities and the selected variables and the findings reveal that the *P*-values for age ($P = 0.120$), sex ($P = 0.339$), birth order ($P = 0.210$), birth weight ($P = 0.989$), type of family ($P = 0.530$), maternal occupation ($P = 0.186$), maternal education ($P = 0.265$), duration of treatment ($P = 0.952$), age of diagnosis ($P = 0.846$), and number of siblings ($P = 0.803$) were not found to be

Table 2: Mean and standard deviation of behavioral pediatric feeding problem score, Parent's pediatric feeding problem score, and parental pediatric feeding strategies and feelings score among children with different developmental disabilities (*n*=150).

Diagnosis of child	Parent's pediatric feeding problem score	Behavioral pediatric feeding problem score	Parental pediatric feeding strategies and feelings score
Autism spectrum disorder			
Mean	10.75	58.59	28.22
Standard deviation	6.36	11.14	7.55
Cerebral palsy			
Mean	7.35	53.81	23.15
Standard Deviation	7.13	13.35	8.27
Attention-deficit hyperactivity disorder			
Mean	13.29	63.29	27.57
Standard Deviation	6.82	11.75	8.11
Specific language disability			
Mean	6.74	57.11	23.95
Standard Deviation	6.53	11.57	8.48
Intellectual disability			
Mean	13.79	66.62	31.17
Standard Deviation	6.33	10.95	9.43
Down's syndrome			
Mean	8.67	54.33	23.38
Standard Deviation	7.29	10.37	7.87

Range of behavioral pediatric feeding problem score - 25–125, Range of parent's pediatric feeding problem score - 0–35, Range of parental pediatric feeding strategies and feeling score - 10–50

Table 3: Chi-square value showing an association between behavioral pediatric feeding problem score among children with developmental disabilities and selected variables (*n*=150).

S. No.	Selected variables	Between behavioral pediatric feeding problem score		Chi-square value	*P*-value
		Behavioral pediatric feeding problems not present	Behavioral pediatric feeding problems present		
1	Age				
a	6 years–8 years	35	37	2.577	0.276
b	8 years–10 years	22	22		
c	10 years–12 years	22	12		
2	Sex				
a	Male	48	47	0.476	0.49
b	Female	31	24		
3	Mode of delivery				
a	Vaginal institutional delivery	43	32	3.931	0.14
b	Cesarean section delivery	26	34		
c	Assisted delivery (forceps/vacuum)	10	5		
4	Birth order				
a	One	38	33	5.519	0.138
b	Two	16	24		
c	Three	18	12		
d	More than three	7	2		
5	Birth weight				
a	Below 1.5 kg	11	15	2.326	0.508
b	1.5 kg–2.5 kg	18	13		
c	2.5 kg–3.5 kg	28	28		
d	3.5 kg above	22	15		
6	Number of siblings				
a	Nil	45	30	3.694	0.296
b	One	13	17		
c	Two	14	18		
d	More than two	7	6		
7	Type of family				
a	Nuclear Family	46	30	3.863	0.145
b	Joint Family	31	38		
c	Extended Family	2	3		
8	Socioeconomic Status				
a	Upper	3	2	5.775	0.217
b	Upper middle	28	14		
c	Lower middle	22	23		
d	Upper lower	25	29		
e	Lower	1	3		
9	Education of Mother				
a	Professional	8	1	6.626	0.357
b	Graduate and above	33	28		
c	Senior secondary	9	10		
d	Matric	6	6		

(Contd...)

Table 3: *(Continued).*

S. No.	Selected variables	Between behavioral pediatric feeding problem score		Chi-square value	*P*-value
		Behavioral pediatric feeding problems not present	Behavioral pediatric feeding problems present		
e	Middle school	6	7		
f	Primary school	9	7		
g	Illiterate	8	12		
10	Occupation of Mother				
a	Government	14	2	9.153	0.027*
b	Private	16	15		
c	Self-employed	8	11		
d	Housewife	41	43		
11	Nutritional status of child according to body mass index-for-age categories				
a	Normal weight	21	13	24.381	0.000*
b	Underweight	25	47		
c	Overweight	26	4		
d	Obesity	7	7		
12	Diagnosis of child				
a	Autism spectrum disorder	15	17	18.916	0.002*
b	Cerebral palsy	20	6		
c	Attention-deficit hyperactivity disorder	10	18		
d	Specific language disability	12	7		
e	Intellectual disability	7	17		
f	Down's syndrome	15	6		
13	Duration of any sensory intervention program given by the hospital/Child Guidance Center				
a	<6 months	39	33	0.708	0.871
b	6 months–1 year	15	16		
c	1–2 years	9	6		
d	>2 years	16	16		
14	Age of child at which diagnosis is made				
a	Birth–2 years	21	17	3.31	0.346
b	2 years–4 years	23	29		
c	4 years–6 years	24	20		
d	6 years–8 years	11	5		

*Significant at 0.05 level of significance

statistically significant at 0.05 level of significance except for mode of delivery at birth ($P = 0.016$), socioeconomic status ($P = 0.050$), nutritional status ($P = 0.000$), and diagnosis of child ($P = 0.003$).

Thus, the parent's pediatric feeding problem is influenced by the maternal mode of delivery, the socioeconomic status of the family, nutritional status, and diagnosis of the child.

Section 3C: Findings related to the association between parental pediatric feeding strategies and feelings among children with developmental disabilities and selected variables.

Chi-square value was computed to seek the association between parental pediatric feeding strategies and feelings score among children with developmental disabilities and the selected variables and the findings reveal that the *P*-values for age ($P = 0.315$), sex ($P = 0.188$), birth order ($P = 0.411$), birth weight ($P = 0.814$), type of family ($P = 0.221$), maternal occupation ($P = 0.070$), maternal education ($P = 0.089$), duration of treatment ($P = 0.945$), age of diagnosis ($P = 0.996$), and number of siblings ($P = 0.525$) were not found to be statistically significant at 0.05

level of significance except for mode of delivery at birth (P = 0.018), socioeconomic status (P = 0.050), nutritional status (P = 0.000), and diagnosis of child (P = 0.008).

Thus, parental pediatric feeding strategies and feelings are influenced by the maternal mode of delivery, socioeconomic status of the family, nutritional status, and diagnosis of the child.

DISCUSSION

The quality of life and emotional state of parents of children with neurodevelopmental disorders are recognized to be lower than those of parents whose children are developing normally and who require assistance to improve.[11] Other authors also described in their study that children with neurodevelopmental disorders need parental support for feeding and daily care.[3,11,12] In addition, these children show disrupted feeding patterns, which may have short- or long-term effects on behavioral, sensory, psychological, and nutritional domains. Parent-child interactions during feeding tend to be problematic, leading to more coercive feeding, limited autonomy in feeding, and maladaptive feeding-related behaviors.[7,11,12]

The present study found that almost all children with ASD, ADHD, ID, SLD, cerebral palsy, and Down syndrome were having behavioral feeding problems and problematic parental strategies and feelings. This supports the study done among children diagnosed with ASD, cerebral palsy, ID, ADHD, and SLD.[7,11,13-16]

Children with ASD frequently experience food refusal and limited food variety, with studies showing significant differences in mealtime behavior compared to typically developing peers.[17] Feeding difficulties often include picky eating, delayed self-feeding skills, and a reliance on specific food types among children with ASD.[18] Feeding difficulties in children with ASD can lead to malnutrition and childhood obesity. Parents report feeding difficulties and poor nutrition among children diagnosed with ASD.[19,20] According to previous studies, children with eating problems had a significantly higher prevalence of ADHD and/or ASD, suggesting an overlap.[21]

While specific studies on ADHD and ID were less prevalent, children with these conditions also demonstrated increased feeding problems, often exacerbated by behavioral issues and parenting stress. Disruptive behaviors in children with ADHD can lead to maladaptive feeding strategies, further complicating their nutritional intake.[22] Other studies also suggested that hyperactive children and children with psychiatric problems were susceptible to feeding problems.[23]

Previous similar studies indicate that children having feeding and eating disorders are at more risk for developing ADHD, ASD, and ID, suggesting a potential link between these neurodevelopmental disorders and behavioral feeding problems.[24] Feeding behavior problems are common in children diagnosed with SLD and found that 39.5% of children had feeding problems, which were associated with lower dietary protein intake and negative correlations with anthropometric measurements.[15] The BPFAS effectively captures the nuances of parental feelings and strategies, which are critical in understanding feeding behaviors in children with various diagnoses.[25] Similarly, another study showed a significant relationship between intellectual and developmental disabilities levels and feeding problems along with nutritional status in young adults with intellectual disabilities.[26]

The conclusions of this review are that children with ASD and their parents found significant challenges and need support and coping strategies to manage their child's care and their own well-being.[27] Feeding is strongly correlated with nutritional status and health status in children with CP, and multiple diagnosed health issues can also make feeding difficult.[28,29] Feeding issues reported by parents of children with Down syndrome include fussiness, satiety responsiveness, and a slower eating pace.[30] The most common behavioral feeding problems among developmentally disabled children according to rank order and the findings reveal that with regard to behavioral pediatric feeding assessment score, leaving the table during meals (95.3%), prolonged meal durations exceeding 20 min (83.3%), and tantrums occurring at mealtimes (82%) were found to be the three most concerned behavioral feeding problems present in children with varying developmental challenges. This is supported by the study in which the feeding behavior during mealtime such as delaying eating by talking and getting up from the table during meals were the main characteristics of food refusal among children.[4]

The study concluded that there is a relationship between parental feeding behavior and child weight status based on the child's diagnosis, family income, and gender.[31,32] Another literature on feeding interventions conducted among children with disabilities also identifies a lack of economic resources, insufficient training among medical staff and caregivers, and the need for sustainable interventions in resource-limited settings.[5] A systematic review study concluded that occupational therapists along with other health team members are best positioned to address different feeding behaviors through behavioral and parent-mediated interventions.

Limitations and recommendations

The study's limitations include its focus on developmental disabilities such as ASD, cerebral palsy, SLD, ADHD, ID, and Down syndrome, which may not encompass all conditions, and the limited generalizability due to the sample being drawn from a single center in New Delhi. In addition, the

focus on behavioral feeding problems may overlook other influencing factors such as environmental and psychological variables or additional health-related variables. Longitudinal studies could provide more comprehensive insights. Further research can be carried out considering factors affecting behavioral feeding, i.e., sensory problems/profile, parenting styles, different dietary interventions, malnutrition, functional mobility, and maternal cognition.

CONCLUSION

Children with ASD, ADHD, and ID exhibit higher behavioral feeding problems, with parental pediatric feeding strategies and feelings being more problematic. Leaving the table during meals (95.3%), prolonged meal durations exceeding 20 min (83.3%), and tantrums occurring at mealtimes (82%) were found to be the three most concerning behavioral problems of feeding present among children with learning and developmental differences. The study found an association between behavioral feeding issues, maternal occupation, child's nutritional status, and diagnosis and also found a link between parental pediatric feeding strategies and feelings as well as problems, delivery mode, and family socioeconomic status. The finding of the study also has several implications so that nursing services are to be based on individualized periodic assessment and dietary intervention for behavioral feeding problems among children. Parental counseling and training can be done for adopting better feeding strategies to deal with feeding problems among children with developmental disabilities in the hospital as well as in the community settings. The nurse administrator should take the initiative to make protocols and policies of regular screening for nutritional and feeding problems related to the behavior among these neurodiverse children. Future studies should involve a larger sample size to improve robustness and generalizability and adopt a multicentric approach, incorporating data from various regions of India and international settings.

Ethical approval: The research/study was approved by the Institutional Review Board at Vardhman Mahavir Medical College and Safdarjung Hospital, number IEC/VMMC/SJH/Project/Thesis/2023-11/406, dated December 08, 2023.

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