

Prevalence of Feeding Problems in Children with Intellectual Disability

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Objectives: Feeding is an essential function which affects quality of life of the intellectually disabled (ID) persons. Approximately 80% of the severe and profound mentally retarded population have some feeding difficulties. This study aimed to determine the prevalence of feeding problems in children with ID.

Methods: In this cross-sectional descriptive study, 144 individuals with Intellectual Disability referred to speech and language pathology clinic were included using random sampling. To gather the data, Screening Tool of feeding Problems (STEP) was used. Data analysis was done through SPSS.

Results: The findings of the study indicated that all subjects were somehow involved with feeding problems. The results also show that mean score of problem in feeding skills (2.41) are most prevalent and aspiration risks (0.37) are of less prevalence among the subjects. Analyses revealed that gender and level of ID severity are effective factors in feeding problems.

Conclusion: Our study indicates that in children with ID, eating problems are more prevalent than previously reported. The importance of these data is further underscored by the fact that the majority of these feeding problems had not been previously identified.

Key words: Feeding problems, Intellectual disability, Screening Tool of feeding Problems

Introduction

Feeding, an essential adaptive function that affects quality of life of the intellectual disabled persons (ID), is a complex sensorimotor process that involves integration between the nervous system and the muscles and is affected by environmental factors (1). Feeding enables the child to grow up, learn, and develop relationships with others (2) and is associated with the development of social and communicational skills (3). Any deficit in structure and/or function can lead to difficulties in performing feeding activities such as chewing, swallowing, and drinking (4). These feeding problems have been linked to various disorders, including ID (5), and shown to affect physical, mental, social and educational development (6, 7).

Feeding disorders are common in early childhood; the incidence of minor feeding problems has been

ranged between 25% and 35% in normal children (8). Palmer, Thompson, and Linscheid reported that approximately 1/3 of individuals with developmental disabilities have some feeding problems, furthermore approximately 80% of the severe and profound mentally retarded people have some feeding difficulties (9).

There are numerous types of feeding problems in the developmentally disabled people, and assessment and treatment should be tailored to address each specific one. Sisson and Van Hasselt suggested that feeding problems could be divided into four categories; (1) lack of independent skills, (2) disruptive behavior, (3) eating so much or little, and (4) selectivity (by type and texture) (10). Though these categories do account for many feeding problems, they are not comprehensive. Other feeding problems presented among the mentally

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retarded population that are not included in this model are rumination, vomiting, pica, food stealing (during and/or outside of meal times), and other areas of selectivity (*i.e.*, setting, temperature, and feeder). Fredericks, Carr, and Williams found that 6–10% of developmentally disabled persons living in institutional settings engage in rumination (behaviors that repeatedly bring food past one's airway) (11). Unfortunately, risks associated with rumination are aspiration, suffocation and/or pneumonia which can be fatal. According to Konarski, Favell, and Favell rumination is estimated to be the cause of death in 5–10% of those who ruminate (12). Pica is another serious behavior that occurs in 9–25% of mentally retarded individuals in institutional settings (13). Individuals who ingest inedible objects (*i.e.*, pica) such as paint chips and cigarette butts are at great risk of poisoning and intestinal obstruction (14). Individuals who are food refusal or food selective, either by type (*e.g.*, eat only cheeseburgers), texture (*e.g.*, eat only pureed foods), temperature (*e.g.*, eat only foods of room temperature), feeder (*e.g.*, will only eat if fed by their mother), location (*e.g.*, will only eat alone), or a combination of these, are at risk of malnutrition, and possibly the need for a feeding tube if they do not take in enough food or lack a well balanced diet. Many feeding difficulties pose serious health risks, including aspiration, the need for feeding tubes, poisoning, and malnutrition (15). O'Brien, Repp, Williams and Christophersen discussed the lack of feeding skills that can result being maintained on a developmentally inappropriate diet/food texture (16). An inappropriate diet for the individual's developmental level can result in delayed development of chewing and sucking. Systematic and effective identification of feeding problems and problematic mealtime behaviors is essential in order to inform the physicians and therapists (*i.e.*, psychologists, nutritionists, speech therapists and occupational therapists) who can be involved with evaluation and treatment (17). However, only slight evidence exists whether how people on the various levels of ID differ in amount and type of their feeding problems. According to the aforementioned issues, the prevalence of feeding problems in ID children has been targeted in the present study.

Materials and Methods

Participants

In this cross-sectional descriptive study, 144 individuals with intellectual disability (mild, moderate and

profound percentiles were 4.8%, 14.2% and 72% respectively) referred to speech and language pathology clinic of University of Social Welfare and Rehabilitation Sciences were recruited using random sampling. Diagnoses of intellectual disability were previously made by individually administered intelligence tests (*e.g.*, Stanford–Binet IV).

Materials

To gather the data, feeding problem questionnaire was used as well as demographic questionnaire which contains gender, age, height, weight, BMI, IQ, type of disability, mothers' age and education. To detect feeding problems in participants, we applied the Screening Tool of feeding Problems (STEP). The STEP is a 23-item feeding problem screening instrument for persons with intellectual disability. The contents of screening instrument were instructed to respond the items in terms of two dimensions, frequency and severity. Each dimension can be rated on a 3-point Likert-type scale. On the frequency dimension, "0" indicates no occurrence of the behavior in the last month, "1" indicates the behavior occurred once to 10 times, and "2" indicates the behavior has occurred more than 10 times. For the severity dimension, "0" suggests that the behavior does not cause any harm or problems, "1" presents the behavior causes some problems and/or results in harm, and "2" shows that the behavior causes serious problems and/or injury. The general categories of feeding problems included: aspiration risk, selectivity, feeding skills, food refusal related behavior problems, and nutrition related behavior problems.

Data analysis

The obtained data from the questionnaires were initially analyzed by descriptive statistics. Continuous variables are presented in terms of mean value, SD and range. Data analysis was conducted using the statistical package for the social sciences (SPSS) version 12. Simple percentages were obtained, Independent t-test and Univariate analysis of variance (ANOVA) were used and correlation analyses were also performed to assess the association between variables. $P < 0.05$ level was considered for statistical significance.

Results

The number of participants was 144 (96 male, 48 female) ranging from 3 to 13 years old with standard deviation of 2.125. Distribution of these children was as follow: 30 down syndrome (20.8%), 30 autistic (20.8%), 46 cerebral palsy (31.94), and 36

other disabilities (26.38) with IQ scores of 32 for mild (22.22%), 80 moderate (55.55%), and 32 cases severe with ID (22.22%).

Mothers' minimal and maximum ages were 26 and 55 respectively with the SD of 6.47 whose academic levels included; 10 under diploma (6.94%), 88 diploma (61.11%), 2 associate diploma (1.38%), 40 BSc (27.77%) and 4 MSc (2.77%). Other demographic information is presented in table 1.

Total feeding difficulties for individuals were measured by the sum of responses to the 23- STEP items (with scores ranging from 0 to 46). The findings of the study indicated that all subjects were somehow involved with feeding problems. Mean score for total STEP was 7.41 with a SD of 2.84.

Results showed that among the all participants 42 (29.16%) were at aspiration risk, 106 (73.61%) had disability of selectivity, 114 (79.16%) showed feeding skills disorders, 92 (63.88%) suffered from food refusal related behavior problems and 96 (66.66%) with nutrition related behavior problems. The other results indicate that mean scores of problem in feeding skills (2.41) are most prevalent and aspiration risks (0.37) are of less prevalence among the subjects.

Analyses were also implemented to determine the mean score in STEP depending on the participants' gender and level of ID. Independent t-test was used for comparison between the male and female and among the mild, moderate and severe levels of ID group. Severity of feeding difficulty was observed to be greatest in male participants (table 2). As seen in tables 3 and 4, the severity of feeding problem was also greatest for those with severe ID compared to the mild and moderate level of ID group.

Table 1

Variable	N = 144			
	Min	Max	Mean	SD
Height*	0.75	1.60	1.20	0.21
Weight**	8.00	52.00	28.13	11.54
BMI	10.20	32.00	18.57	4.16

* Meter

** Kilogram

Table 2

Variable	N = 144				P value
	Female		Male		
	Mean	SD	Mean	SD	
Feeding Problems	6.12	3.04	8.06	6.76	0.004

Table 3

Variable	N = 144						P value
	Sever		Moderate		Mild		
	Mean	SD	Mean	SD	Mean	SD	
Feeding Problems	13.81	8.45	6.37	3.15	3.62	1.50	< 0.001

Table 4

	N = 144			
	SS	df	MS	F
Between Groups	927.93	2	463.96	21.40
Within Groups	1495.56	141	21.67	
Total	2423.50	143		

Discussion

Proper eating/feeding behaviors are important to have a healthy lifestyle (18). Feeding problems are serious clinical problems that complicate the management of children with intellectual disabilities (19). The results of the current study show a high prevalence of feeding problems in children with ID. Other studies report feeding problems in about 80% of children with intellectual disabilities (9). The present results suggest a higher prevalence of feeding problems in children with ID. This is consistent with the study of Matson (13). Similar to other problem behaviors in ID, the etiologies of feeding problems are usually discussed as either medical or environmental (*e.g.*, esophageal reflux and food refusing as medical and environmental, respectively).

The most prevalent feeding problems found in this study were in the area of feeding skills, including, inability to feed him/herself independently, requiring special equipment for feeding, and requiring special positioning during feeding. This finding is similar to Matson (13). Feeding skill disorders include items which are motor oriented, may derive from sensory motor difficulties affected by sensory modulation, muscle tone, coordination and endurance that influence ability in timing and accuracy of the mouth movements, or from sensory-motor disabilities that affect control of the food in the mouth. Indeed, the literature suggests that children with ID often present difficulties in their motor skills that are affected by their general severe brain damage, lack of motivation to develop motor learning, and decreased heart activity (19). The lack of motor experiences may also result in further motor limitations (20). In this instance, being male and more severely intellectually disabled further increases the ID person's risk for feeding problems. This result should be taken into account in the planning of clinical services, particularly with respect to feeding issues.

Conclusion

To conclude, our study indicates that in children with ID, eating problems are more prevalent than previously reported. The importance of these data is better underscored by the fact that the majority of these feeding problems had not been previously identified. This study may therefore have great implications for the places where clinicians can direct efforts and preventative care. It is of importance that all children with ID will be assessed for feeding problems, and these problems will be treated using suitable and proper methods.

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