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The Behavioral Pediatrics Feeding Assessment Scale in Telugu (BPFAS-T)

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Abstract

The Behavioural Paediatrics Feeding Assessment Scale (BPFAS) was commonly used to assess the children's feeding behaviours. Assessing behaviours is extremely beneficial in understanding the child's mental state and tracking further developmental aspects. This scale was available in the majority of languages; which is not available in Telugu, the language spoken by the Indian states of Andhra Pradesh and Telangana. However, cultural and lingual aspects should be considered when assessing certain aspects of children's behaviour. In this context the current study aimed to adapt the BPFAS scale into Telugu. This study included 380 parents of children with autism spectrum disorders (ASD). The children ranged in age from 1 to 8 years. Parents were instructed to fill out the questionnaire correctly. The obtained scores were examined using reliability, independent t test, and one way ANOVA. The results revealed a Cronbach's alpha of ***0.729***, indicating that the BPFS-Telugu is acceptable and can be used clinically. The independent t test revealed that there is a high significant difference between total scores, a significant difference between frequency scores, and no significant difference between problem scores. One-way ANOVA was used to compare severity, and the results show that there is a significant difference between total scores, a high significant difference between problem scores, and no significant difference between frequency scores. The independent test for frequency score revealed a highly significant difference between ASD children with and without behavioural problems, as well as problem scores. Overall, 55.5 % (frequency scores) and 55.1% (problem scores) of ASD children were identified with behavioural issues during feeding time. Finally, the authors stated that BPFAS in Telugu is clinically acceptable and can be used to assess for behavioural issues during feeding time.

Keywords: ASD; BPFAS; Telugu; Behavior and feeding problems

1. Introduction

The Diagnostic and Statistical Manual of Mental Disorders (DSM-5 TR) 2022 refers to a group of disorders as having a "autism spectrum disorder" (ASD), which includes autism, Asperger syndrome, childhood disintegrative disorder, and pervasive developmental disorder-not otherwise specified (PDD-NOS). The most common form of ASD, a neuro-developmental condition, is autism/autistic disorder.

The most common symptoms of autism include difficulties with communication and social interaction, language delay, constrained interests, repetitive behaviors, poor speech or no speech, lack of eye contact, trouble adjusting to changes in routine, hyperactivity or passiveness, and over- or under sensitivity to touch and noise. Diagnostic criteria for autism spectrum disorder include challenges with "social communication" and "restricted, repetitive and/or sensory behaviors or interests. For a teen to be recognized as having autism spectrum disorder, have demanding situations and/or variances from what is usual in both areas, and even if these traits aren't noticed until later in childhood, they have existed since early childhood.

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According to DSM-5, "eating/feeding problems" or "disruptive mealtime behaviours" are listed as secondary symptoms of ASD, however food refusal, food selectivity, and stressful mealtime behaviours (i.e. , oral-motor issues, such as difficulty chewing, swallowing medicines, and behavioural issues (such as sobbing, closing his/her mouth, spitting, keeping the food in mouth, etc.) are often visible in autism. In addition, children with autism frequently experience issues with drooling, vomiting, and gagging. ASD usually manifests before the age of three and can last the rest of a person's life, though symptoms occasionally become better with age.

Within the first year of life, some children can exhibit ASD symptoms. Some individuals might not start to exhibit symptoms until they are 24 months or older. Up until the age of 18 to 24 months, some children with ASD experience new skill development and developmental milestones, after which they stop or lose the skills they had before. Anyone, regardless of gender, race or ethnicity, or socioeconomic standing, can be diagnosed with ASD. Despite the fact that ASD can be a lifelong illness, there are programs and therapies that can help with symptoms and day-to-day functioning.

In order to encourage healthy eating habits and guarantee that the child's nutritional needs are satisfied, parental duties in feeding and supporting a kid with autism spectrum disorder (ASD) in their eating habits can be vital. The management of children with autism must include parental engagement in food and eating issues. Mealtimes can be difficult for both the child and their parents when a youngster has autism spectrum disorder (ASD), which frequently causes sensory sensitivities, food aversions, and selective eating patterns.

[1] developed BPFAS in English and assessed on 96 healthy children in the age range of 9m to 7years and found that there was no significant correlation between socioeconomic status and BPFAS total frequency score ($r = .078$, $p = .479$). Univariate analysis found no significant effects for child's gender, birth order, age group, feeding skill, or marital status on the BPFAS total frequency score. Comparing scores between independent eaters ($n = 42$) and those requiring assistance ($n = 54$), mean total frequency scores on the BPFAS did not differ ($F = .479$, $df = 1,94$, $p = .49$). In contrast to fundamental differences in mealtime behaviours, the variation in parental reports of feeding difficulties between the healthy and clinical groups appeared to be related to the frequency of problematic behaviour exhibited by children with feeding difficulties. [2] feeding problems are common, affecting around 25% to 45% of typically developing children in early age (6 to 42mths). [3] 90% of ASD children face picky eating and mealtime disruptions. [4] significant main effect for age on the BPFAS total frequency score, indicating that feeding difficulties increased as children aged. There was no connection between feeding assessment and socioeconomic status since the socioeconomic status was similar in ASD and normal children [5]. [6] parent-reported feeding problems are relatively common among typically developing children in Greece. [7] used Karaduman Chewing Performance Scale (KCPS) to asses chewing performance, the Behavioural Paediatrics Feeding Assessment Scale (BPFAS) to check feeding issues, and the Turkish version of the Feeding/Swallowing Impact Survey (T-FS-IS) to check the parental impacts on 56 children (37 with autism, 19 typically developing) and found that there is a high significant difference between frequency score in BPFAS and authors also stated that children with autism had more trouble biting and eating than regular children. [8] no significant predictors of BPFAS total frequency scores. If a child shows a lot of feeding problems, especially those related to skills or behaviour, they should be referred for further evaluation and necessary treatment, as this might indicate underlying feeding difficulties [9]. Children with autism exhibiting oral hypersensitivity may face more challenges related to food acceptance compared to those without oral hypersensitivity [10]. Oral sensory problems are associated with both feeding and communication difficulties in children with autism [11]. [12] stated that feeding problems are more common in young children with gastrointestinal diseases and are influenced by specific mealtime factors and parental practices. no gender differences [13], no significant difference between malnourished and healthy children [14]. Relation between oromotor deficits with specific food consistencies and feeding related behaviour problems in children with neurodevelopmental children [15].

1.1. Need and Aim of the study

Despite the fact that BPFAS is available in English and many other languages, it is essential to have it in regional languages in order to overcome multilingual/multicultural issues. When it comes to languages, India is a multilingual and multicultural country. Telugu is the reputable language of the Indian states of Andhra Pradesh and Telangana. Telugu is the maximum broadly spoken member of the Dravidian language family, and one of the Republic of India's twenty-two scheduled languages, spoken by approximately 96 million people (2022). Along with Hindi and Bengali, it is one of the few Indian languages with primary official status in more than one state. In current days the ASD is increasing in population and due to insufficient of scales and tools many aspects were untreated at the right time to the child. Due to dearth of research in assessing behavioral issues in ASD children in Telugu language, the current study was aimed to develop and standardize BPFAS into Telugu language.

2. Material and Method

2.1. Participants

The study included 380 parents of children with autism spectrum disorder (ASD). The children ranged in age from 1 to 7.11 years. All of the children have ASD and are undergoing various therapies.

Updated Kuppuswamy socioeconomic scale [16] was used to check the participant's socio-economic status which revealed that all the participants were fall under the range of 16-25 (upper middle) and 26-29 (middle) category.

2.2. Materials

[1] developed the Behavioural Paediatric Feeding Assessment Scale (BPFAS) in English. The authors were granted the necessary permission to trans-adapt.

2.2.1. Translation Process

The BPFAS English version was trans adapted into Telugu language (forward) and Telugu to English (backward) to check the accuracy of the questionnaire. Further, the questionnaire was given to Telugu linguist and also was given to five experienced Speech Language Pathologist's to check the proficiency of the questionnaire.

2.3. Procedure

2.3.1. Pilot study

The final questionnaire was given to the parents of twenty normal children and ten ASD children in the age range of 3 to 8 yrs. After the results of pilot study minor modifications was done to the questionnaire which was later used for the study.

Prior to the research, the researcher thoroughly explained the study's goals and benefits, and consent forms were obtained. All of the parents were instructed to read the questions and select the appropriate answers. The collected data was used for further analysis.

2.4. Analysis

Statistical analyses such as alpha, independent t test, and one way ANOVA were used to compare and check the reliability, severity, and with and without behavioral problems in children with ASD.

3. Results

The current study results were explained in detailed based on various factors such as reliability, gender, age, severity, behavioral problems in both frequency and problem scores in children with ASD as follows.

3.1. Reliability

The overall reliability index of BPFAS-T items using Cronbach's alpha is $\boldsymbol{\alpha=0.729}$ this indicates the BPFAS-T questionnaire is acceptable and reliable to assess behavioural issues during feeding in children.

3.2. Gender

Previous research had shown that males are more affected than females. The current study will determine whether gender has an effect on behavioural problems during feeding in ASD. There were 326 males and 59 females among the 380 participants. This means that 85.7% of the population is male, while only 15.5% is female. It is clear that males are more likely to be diagnosed with ASD than females. The current study found a statistically significant difference ($p=0.008$, $p<0.05$) between total scores, but no statistical difference between frequency and problem scores. The data was given in table 1.

Table 1 Mean and SD between gender in various scores

Scores	Gender	Mean	SD	t	Sig.
Total scores	Males	93.61	13.05	-2.66	0.008*
	Females	98.85	17.82		
Frequency score	Males	81.87	15.84	-0.33	0.73
	Females	82.61	13.15		
Problem score	Males	8.2	4.2	0.35	0.72
	Females	8.0	3.2		

*Statistically significant difference (p<0.05)

3.3. Age

Table 2 Mean and SD across age groups

Scores	Age Groups	N	Mean	SD	F	Sig.
Total Score	G1	120	93.29	14.88	0.74	0.47
	G2	140	95.42	14.33		
	G3	120	94.40	12.73		
	Total	380	94.43	14.02		
Frequency Score	G1	120	80.69	15.75	0.64	0.52
	G2	140	82.59	16.38		
	G3	120	82.68	14.07		
	Total	380	82.02	15.47		
Problem Score	G1	120	7.52	3.61	3.16	0.04*
	G2	140	8.66	4.01		
	G3	120	8.53	4.06		
	Total	380	8.26	3.93		

*Statistically significant difference (p<0.05)

The BPFAS-T scores were compared and checked across age groups because behaviours vary with age. In the current study focused on three age groups: G1 (1 to 2.11yrs), G2 (3 to 4.11 yrs) and G3 (5 to 7.11 yrs). Table 2 contains the information relation to mean and SD across age groups. One way ANOVA followed by post hoc (Bonferroni) was done to compare test scores between age groups. The results revealed that there is no significant difference between age groups in both total and frequency scores, whereas, F=3.16 (2, 377) = 0.04 (p<0.05); this indicates that there is a significant difference between age groups in problem score, similarly, post hoc test revealed that there is a significant difference between G1 and G2 where p= 0.05 (≤0.05).

3.4. Severity

The severity of ASD symptoms and behaviours varies. In order to determine the BPFAS-T severity scores, A one-way ANOVA was used, and the results show a suggestive difference (p=0.004) in total scores, a high significant difference (p=0.000) in problem scores, and no significant difference (p=0.49) in frequency scores. The post hoc test (Bonferroni) reveals a significant difference in total scores between mild to severe (p=0.014) and moderate to severe (p=0.007). In contrast, mild to moderate (p=0.005) is a suggestive difference, while moderate to severe (p=0.000) is a highly significant difference. The data was given in the table 3.

Table 3 Mean and SD across severity

Scores	Severity	N	Mean	SD	F	Sig.
Total Score	Mild	235	95.15	15.44	5.59	0.004*
	Moderate	66	97.14	9.00		
	Severe	79	90.01	12.03		
	Total	380	94.43	14.02		
Frequency Score	Mild	235	82.09	16.73	0.71	0.49
	Moderate	66	83.57	12.17		
	Severe	79	80.50	13.97		
	Total	380	82.02	15.47		
Problem Score	Mild	235	8.12	3.90	7.77	0.000**
	Moderate	66	9.83	4.27		
	Severe	79	7.35	3.33		
	Total	380	8.26	3.93		

*Statistically significant difference ($p<0.05$) and **High statistical difference.

3.5. Frequency score

Out of a total 380 ASD children, 169 ASD were identified with no behavioural problems during feeding whereas 211 ASD children identified with behavioural problems. Which states that more no. of children is having behavioural issues during feeding time which should be screened in early ages. Independent t test revealed that there is a high significant difference between with and with out behavioural problems based on frequency scores. The data is given in the table 4.

Table 4 Mean and SD across frequency scores

Scores	State	N	Mean	SD	t	Sig.
Frequency Score	Without behaviours	169	95.7	9.41	25.68	0.000*
	With behaviours	211	70.9	9.29		

3.6. Problem score

Out of a total 380 ASD children, 184 were identified with no behavioural problems during feeding whereas 196 ASD children identified with behavioural problems. Which states that more no. of children is having behavioural issues during feeding time which should be screened in early ages. Independent test revealed that there is a high significant difference between with and without behavioural problems based on problem scores. The data is given in the table 5.

Table 5 Mean and SD across problem scores

Scores	State	N	Mean	SD	t	Sig.
Problem Score	Without behaviours	184	11.54	2.5	26.91	0.000*
	With behaviours	196	5.17	2.0		

Overall, the summary of the results states that the reliability of BPFAS-T found to be $\alpha=0.729$ which is acceptable and reliable. Only total scores showed a significant difference between gender whereas, there is no Significant difference in frequency and problems scores. However, there is a significant difference between age groups in problems scores and no significant difference found in total and frequency scores. Based on the severity there is a significant difference in total scores and high significant difference in problem scores. According to frequency scores it was identified that 169 ASD children were identified as no behavioural issues during feeding time whereas, 211 ASD children were identified

with behavioural issues during feeding time and there is also a high significant difference between the ASD children with and without behavioural problems during feeding time. Similarly, in problem scores it was noted that 184 ASD children were found with no behavioural problems during feeding time whereas, 196 ASD children were found to be having behavioural problems during feeding time and there is a high statistical difference between them.

4. Discussion

The present study showed that there is no gender difference in frequency and problem scores whereas, gender difference found in total scores. Problem scores showed significant difference based on age groups whereas total scores and frequency scores were not significantly different, authors agreed to [1] found no significant difference between age and gender in BPFAS. The present study authors are also found that out of 380 ASD children 55.5% of the ASD children are having behavioural issues based on frequency scores whereas 51.5% of the ASD children are having behavioural issues based on problem scores, similarly [3] found that 90% of ASD children face picky eating and meal time disruptions. This indicates that most of the ASD children have behavioural issues during feeding time and in general these behavioural problems may have severe impact on the child's malnutrition and as well as oral sensory problems as those problems may indicate sensory issues, which may also show impact on developing speech. High significant difference found between frequency score in ASD children with and without behavioural problems during feeding time which is in favour with [6]. Hence the present study authors stated that it should be mandatory to use a scale like BPFAS-T to identify behavioural issues during feeding time which may also helpful in preventing further complications such as behavioural, feeding and as well as communication problems.

5. Conclusion

Surprisingly, the BPFAS-T was applied to children with ASD, and it was noted that 55.5% of the children were identified as having behavioural issues during feeding time. This demonstrates unequivocally that the BPFAS-T aids clinicians in recognising behavioural issues in ASD children during feeding time. The impact on the child's feeding and communication issues can be better when they are identified earlier. This scale can be expanded even further by using it on a variety of disorders and in a range of age groups.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declared that there are no conflicts of interest.

Statement of ethical approval

If studies involve use of animal/human subject, authors must give appropriate statement of ethical approval. If not applicable then mention 'The present research work does not contain any studies performed on animals/humans subjects by any of the authors'.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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