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The Effect of Oral Motor Therapy on Feeding Difficulties and Eating Behaviours in Younger ASD Children

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ABSTRACT

Background: *A variety of feeding difficulties like aversion of food, food selectivity, complete food refusal are the most common problems reported by the Parents of ASD children. Every parent of ASD children struggles to manage their child's feeding routine as well as undesirable mealtime behaviours, which can cause parental concern and poor family dynamics.*

Aim: *The aim of this study is to analyze the effect of dedicated oral motor work in children with ASD who presented with feeding difficulty. To determine parental concerns related to feeding behavior shown by their child and assess whether an additional home program in parallel with oral motor work by an Occupational Therapist would provide any benefits.*

Method: *This is a pre and post study where a total number of 18 ASD children at the age of 2-4 year old were participated and selected through BPFAS, out of which 15 copies were considered to be concerned with the oral motor and feeding difficulties of the child. Therefore, 15 participants who were facing feeding difficulties with their children were recruited. Concerned Participants were further assessed by Occupational therapist with the help of 'The com deall Oro-motor assessment scale for toddlers'.*

Result: *According to The Com Deall Oral-motor assessment scale, some changes observed in the oral motor skills and when parental concern is considered via home plan including mealtime strategies with oral motor activities, the post intervention result showed decrease in Total problem score as well as in Total frequency score.*

Conclusion: *The study concluded that continuous structured direct oral motor work as well as addressing parental concerns via home programs is helpful for the ASD children and gives better understanding of feeding difficulties to their parents. Also, some changes have been seen in oral motor skills through continuous practice of oral motor activities by the therapist.*

Key words: ASD children, BPFAS, Oral-motor assessment scale, Frequency score

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INTRODUCTION

As per the previous studies, Oral motor skills develop within a system that changes rapidly both in structural growth and neurological control during the first three years of life. During this period, children engage in a great variety of oral motor experiences as they satisfy their basic needs for food and comfort and begin to explore their world. Developmentally, a feeding problem exists when a child is "stuck" in their feeding pattern and cannot progress with relating to Autism Spectrum Disorder (ASD) which is characterized by social communication deficits and repetitive and restrictive behaviors. Many children with ASD also have co-occurring behavioral concerns. For example, an estimated 46-89% of these children exhibit problematic feeding and eating habits compared with about 13-32% of typically developing children. The most common feeding problems in children with ASD include food selectivity based on type, texture or presentation, and disruptive mealtime behaviors, and many presents with both. These problems often emerge in toddler and preschool years before ASD diagnosis and remain in adolescence. Therefore, this study targeted the toddler population in children with ASD who presented feeding difficulties according to their parents [1].

Including parents as the primary agent to address feeding problems seems most appropriate given the central role that parents play in all areas of a young child's life. Hence, the level of intensity of intervention can be naturally increased if parents play the role of change agent. Furthermore, as a child's disruptive mealtime behaviors, selectiveeating, and rigidity have been shown to be correlated with stress and family burden, teaching parent's strategies to improve eating and decrease disruptive mealtimes behaviors could result in decreased parental stress as previously suggested. In a study of disruptive behaviors in children with ASD, parent training diminished parental stress and improved parental sense of competence.

Hypothesis

Research hypothesis 1: Oral motor work reduces feeding difficulties in children with ASD and improves the quality of oral motor skills.

Null hypothesis 1: Oral motor work does not have any effect on feeding difficulties or quality of oral motor skills.

Research hypothesis 2: If parents are involved and their concerns are addressed then there will be significant changes in the child's eating behaviours.

Null hypothesis 2: If parental concerns are involved and addressed even then there will be no changes in their child's eating behaviors.

Aim and objective of the study

In this study, we aim to analyze the effect of dedicated oral motor work in children with ASD who presented with feeding difficulty. To determine parental concerns related to feeding behavior shown by their child and assess whether an additional home program in parallel with oral motor work by an Occupational Therapist would provide any benefits [2].

METHODOLOGY

Sample size

A minimum of 15 participants will be selected for study based on inclusion and exclusion criteria.

Inclusion criteria:

- Age - 2 to 4 Years Old.
- 15 children with Autism Spectrum disorder.
- Both girls and boys are considered for this study.
- Include those children who show oral motor and feeding difficulty.

Exclusion criteria:

- Children who do not show any feeding difficulties.
- Children who are not able to respond to verbal instructions.
- Children below 2 years and more than 4 years.

Research design

Experimental study.

Procedure

- Permission was taken from the ethical committee of the university.
- Written consent will be taken from the parents/ guardians of the selected and Children will be assessed by the therapist through "The Com DEALL Oro motor assessment " scale.
- Parents' caregivers will be given the assessment forms "Behavioral Pediatric Feeding Assessment Scale" to fill.
- Parents of the participants will be handed over certain feeding and mealtime strategies to be incorporated as a home program.
- Participants will be given oral motor work as per the treatment protocol twice a week for one and a half months. This will be administered during their intervention sessions by the respective therapist either in 'one on one', dyadic session or group format.
- After 1.5 months, children will be reassessed by the therapist through "The Com DEALL Oro motor assessment."
- Again, Parents' caregivers will be given the assessment forms "behavioral pediatric feeding assessment scale" to fill up again.
- Scores were statistically analyzed and interpreted for pre and post assessment forms.

Ethical clearance

- Proposal was passed through the dissertation committee of Jaipur Occupational Therapy College and the ethical committee of Maharaj Vinayak Global University before its implementation.
- Participants and their spouses/caregivers were informed about the study objectives, method of testing, benefits of study and risks involved in testing, if any,
- No harm will be caused to participants involved.
- No interference was done in the Participants medical treatment as well as rehabilitation.
- Participants' details were maintained confidential.
- Data thus collected was used only for research purposes.

RESULTS

Intervention

Patients participated in 20-30 minutes of oral motor therapy sessions with an Occupational Therapist twice a week for 1.5 months (10 sessions in total).

Oral stimulation (tapping around the mouth and massages intra & extra orally) was performed manually when mouth muscle control was insufficient.

To improve oral awareness and reduce sensitivity, the vibratory brush is introduced and given passively in a play way by singing rhymes, visual toys, etc. To improve oral muscle strength, a chew tube has been introduced and given by the therapist while sitting in one place.

To improve oral muscle control, the texture of food was gradually thickened (Table 1). Feeding and mealtime strategies were given to the parent/caregiver, as parents are part of this treatment [3].

Table 1: Comparison of jaw movement (JM) scores between pre and post-paired t-test.

JM	Mean	SD	t -value
Pre-score	4.53	1.885	10.333**
Post-score	8.33	1.839	

**Significant at .01 levels.

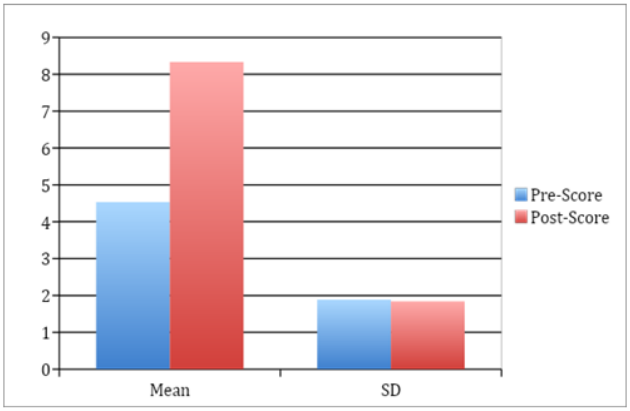

Figure 1: Comparison of JM scores between pre and post-paired t-test.

According to "The Com DEALL Oro motor assessment Scale", the scores are inversely proportional to the oral motor difficulty in children with ASD (Figure 1). Therefore, Pre-test results of Jaw movement of oral motor scale shows a mean 4.53 and standard deviation of 1.885, whereas Post-test results shows an increase in mean of 8.33 and standard deviation of 1.839. So, the results are significant at <0.01 level (Table 2).

Table 2: Comparison of tongue movement scores between pre and post-paired t-test.

TM	Mean	SD	t-value
Pre-score	5.13	1.393	9.886**
Post-score	9.53	1.627	

**Significant at .01 levels.

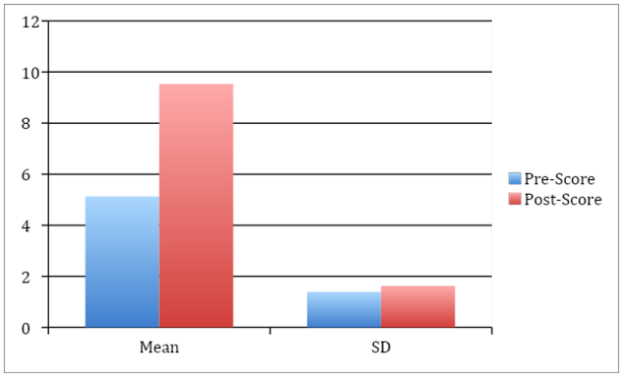

Figure 2: Comparison of TM scores between pre and post-paired t-test.

According to "The Com DEALL Oro motor assessment Scale", the scores are inversely proportional to the oral motor difficulty in children with ASD (Figure 2). Therefore, Pre-test results of Tongue movement of oral motor scale shows a mean 5.13 and standard deviation of 1.393, whereas Post test results shows increase in mean of 9.53 and standard deviation of 1.627. So, the results are significant at <0.01 level (Table 3).

Table 3: Comparison of Lip Movement (LM) scores between pre and post-paired t-test.

LM	Mean	SD	t-value
Pre-score	7.07	4.818	6.271**
Post-score	10.4	4.137	

**Significant at .01 levels.

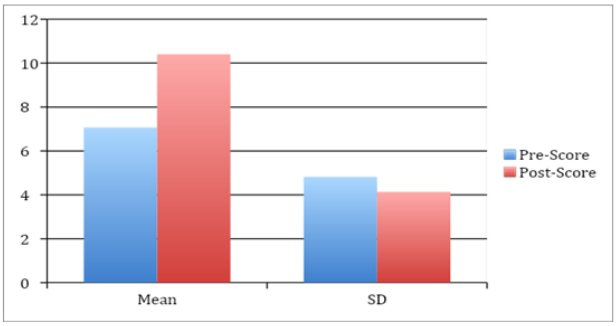

Figure 3: Comparison of Lip Movement (LM) scores between pre and post-paired t-test.

According to "The Com DEALL Oro motor assessment Scale", the scores are inversely proportional to the oral motor difficulty in children with ASD (Figure 3). Therefore, Pre-test results of Lip movement of oral motor scale show a mean 7.07 and standard deviation of 4.818, whereas Post test results shows increase in mean of 10.40 and standard deviation of 4.137. So, the results are significant at <0.01 level (Table 4).

Table 4: Comparison of Speech (S) scores between pre and post-paired t-test.

S	Mean	SD	t-value
Pre-score	2.2	2.933	3.850**
Post-score	3.4	3.68	

**Significant at .01 levels.

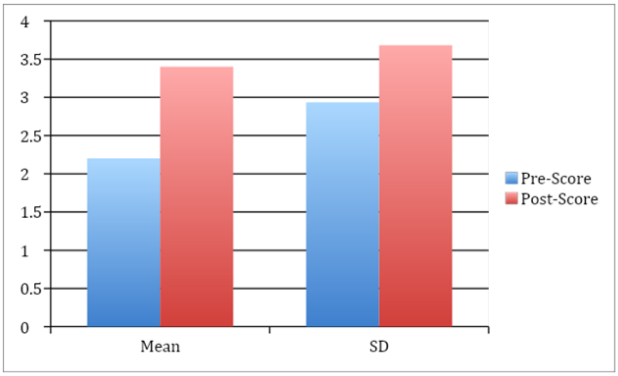

Figure 4: Comparison of speech (S) scores between pre and post-paired t-test.

According to "The Com DEALL Oro motor assessment Scale", the scores are inversely proportional to the oral motor difficulty in children with ASD (Figures 4 and 5). Therefore, Pre test results of Speech of oral motor scale shows a mean 2.20 and standard deviation of 2.933, whereas Post test results shows increase in mean of 3.40 and standard deviation of 3.680. So, the results are significant at <0.01 level (Table 5).

Table 5: Comparison of TFS scores between pre and post-paired t-test.

TFS	Mean	SD	t-value
Pre-score	85.67	16.141	4.234**
Post-score	71.13	17.146	

**Significant at .01 levels.

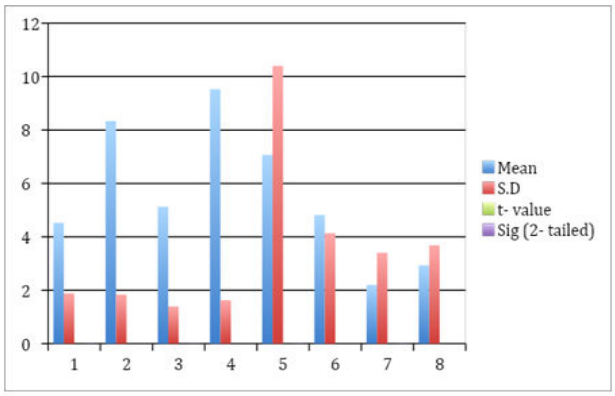

Figure 5: Comparison of the mean Pre and Post score of Jaw, Tongue, Lip and Speech-Paired t-test.

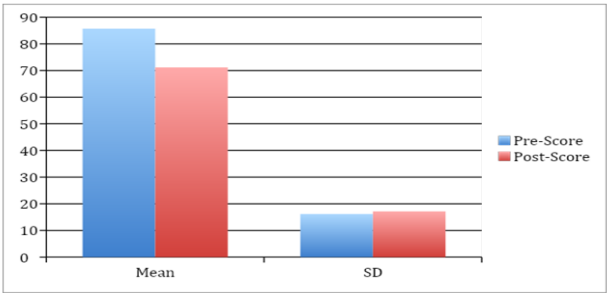

Figure 6: Comparison of TFS scores between pre and post-paired t-test.

According to BPFAS, a higher score is directly proportional to the level of difficulty parents are facing

with their child (Figure 6). Therefore, Pre-test results of Total frequency score of BPFAS shows a mean 85.67 and standard deviation of 16.141, whereas Post test results shows decrease in mean of 71.13 and standard deviation of 17.146. So, the results are significant at <0.01 level (Table 6).

Table 6: Comparison of TPS scores between pre and post-paired t test.

TPS	Mean	SD	t-value
Pre-score	11.13	9.657	5.022**
Post-score	8	8.409	
**Significant at .01 levels.			

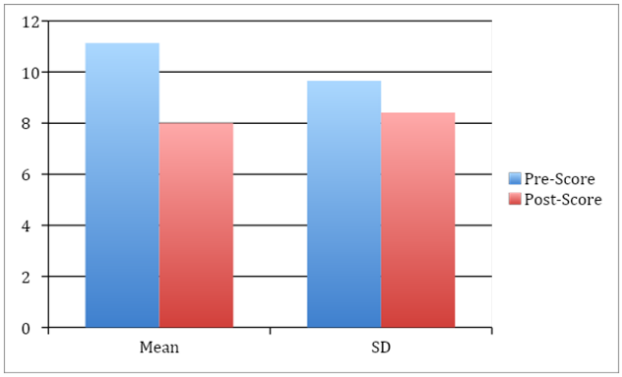

Figure 7: Comparison of TPS scores between pre and post-paired t test.

According to BPFAS, a higher score is directly proportional to the level of difficulty parents are facing with their child (Figure 7). Therefore, Pre-test results of Total Problem score of BPFAS shows a mean 11.13 and standard deviation of 9.657, whereas Post test results shows decrease in mean of 8.00 and standard deviation of 8.409. So, the results are significant at <0.01 level (Table 7).

Table 7: Comparison of CFS scores between pre and post–paired t-test.

CFS	Mean	SD	t-value
Pre-score	66.67	8.902	4.862**
Post-score	51.6	12.217	
**Significant at .01 levels.			

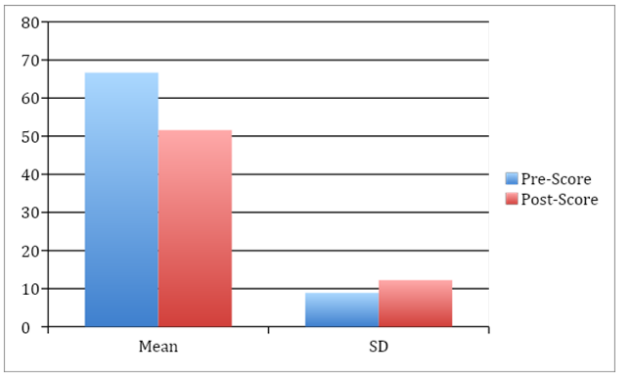

Figure 8: Comparison of CFS scores between pre and post-paired t-test.

According to BPFAS, a higher score is directly proportional to the level of difficulty parents are facing with their child (Figure 8). Therefore, Pre-test results of Children frequency score of BPFAS shows a mean 66.67 and standard deviation of 8.902, whereas Post test results shows decrease in mean of 51.60 and standard deviation of 12.217. So, the results are significant at <0.01 level (Table 8).

Table 8: Comparison of CPS Scores between pre and post-paired t-test.

CPS	Mean	SD	t-value
Pre-score	7.6	6.522	4.281**
Post-score	5.53	6.093	
**Significant at .01 levels.			

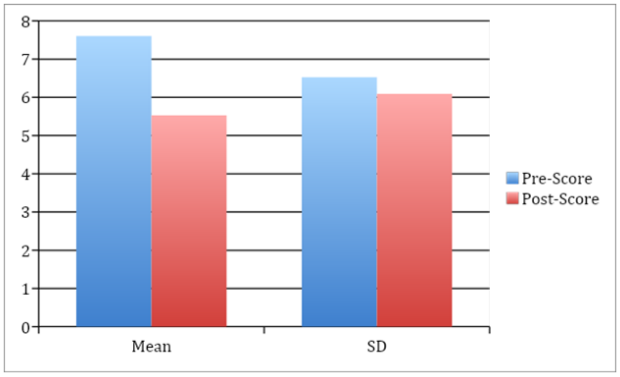

Figure 9: Comparison of CPS Scores between pre and post-paired t-test.

Table 10: Comparison of PFS Scores between pre and post – Paired t-test (N = 15).

PFS	Mean	SD	t-value
Pre-Score	27.27	5.663	6.140**
Post-Score	21.40	7.347	

**Significant at .01 levels.

According to BPFAS, a higher score is directly proportional to the level of difficulty parents are facing with their child (Figure 9). Therefore, Pre-test results of Children Problem score of BPFAS shows a mean 7.60 and standard deviation of 6.522, whereas Post test results shows decrease in mean of 5.53 and standard deviation of 6.093. So, the results are significant at <0.01 level (Table 10) (Figure 10).

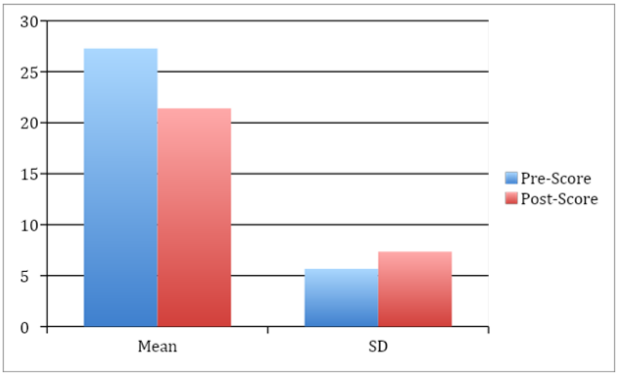

Figure 10: Comparison of CPS Scores between pre and post-paired t-test.

DISCUSSION

This study contributes to our understanding of analysing the effect of dedicated oral motor work in children with ASD who presented with feeding difficulty and to determine parental concerns related to feeding behaviour shown by their child and assess whether an additional home program in parallel with oral motor work by an Occupational Therapist would provide any benefits. The result of present study suggests that there is improvement observed in the level of difficulty shown by the ASD children. Total of 15 ASD children participated in the study along with their parents as feeding was an activity which is carried out by the parents and consent forms were taken. BPFAS were given to 18 participants, out of which 15 copies were considered to be concerned with the oral motor and feeding difficulties of the child. As a result, 15 participants who were facing feeding difficulties with their child were recruited. Concerned Participants were further assessed by Occupational therapist with the help of 'The com deall Oro-motor assessment scale for toddlers'. According to The Com Deall Oral-motor assessment scale, the scores are inversely proportional to the oral motor difficulty in children with ASD.With continuous oral motor therapy for 6 weeks, there were some changes observed in the oral motor skills by the mean post result are Jaw (8.33), Tongue (9.53), Lip (4.818) and Speech (3.40). These results are significant at <0.01 level. Although Speech is not a part of this study but through oral motor therapy some improvement has been witnessed in the speech component. Most of the improvements have been shown in Tongue and Jaw movement as compared to other components [4].

According to BPFAS, a higher score is directly proportional to the level of difficulty parents are facing with their child. When parental concern is considered via home plan including mealtime strategies and oral motor activities, the post intervention result showed decrease in Total problem score by mean of 8.00 and standard deviation of 8.409 as well as in Total frequency score by mean of 71.13 and standard deviation of 17.146. These result are significant at <0.01 level. Therefore, Overall result showed that Oral motor therapy and addressing parental concern via home program intervention were significant ($p<0.01$), reduced the difficulty level as reported by the parents and some changes has been seen in oral motor skills through continuous practise of oral motor activities by the therapist. Hence, the experimental hypothesis is proved by rejecting the null hypothesis. This study is supported by Leila Cherif, Jaweher baudadous et.al, a comparison was made between 57 children with autism spectrum disorders and 57 control groups regarding the feeding problems. Our findings suggest that feeding problems are more common in

children with autism. Clinical implication strigger the need for clinicians to provide the necessary assessment and treatment. Therefore, on the basis of analysis it was found that continuous structured direct oral motor work as well as addressing parental concerns via home programs is helpful for the ASD children and gives better understanding of feeding difficulties to their parents [5].

CONCLUSION

This study concluded that oral motor therapy and addressing parental concern via home program leads to significant changes in ASD children who have feeding difficulties and eating behaviors were significant at the level of <0.01.There were significant changes observed in the oral motor skills and most of the improvements have been shown in Tongue and Jaw movement as compared to other components. Although Speech is not a part of this study, some improvement has been witnessed in the speech component as well. When parental concern is addressed via home program including mealtime strategies and oral motor activities, the post intervention result showed decrease in Total problem score and Total frequency score. Hence, the "Experimental hypothesis- the effect of Oral motor therapy in feeding difficulties and eating behavior in younger ASD children's" is accepted.

Limitation of the study

- The study should be conducted in a larger population for better results.
- Different scales can be used to have a better understanding of the assessment, the com deal oro-motor assessment scale have oro-motor skills components but the sensory component is not there.
- The Behavioural feeding assessment scale is too lengthy; another scale with less questions can be used for better understanding of parental concern.

Direction for future research

The study suggested the need for future research, this study can be studied in a larger population with an experimental group and controlled group along with the parents to see the effect of oral motor therapy via addressing parental concern with the help of the home plan.

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