

RESEARCH ARTICLE

Development of a Multi-Sensory Plate Among Pre-School Children with Picky Eating Behaviour -An Exploratory Experimental Study.

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Abstract: **Background:** Picky eating in preschoolers, often caused by sensory sensitivities and food selectivity, can affect nutrition and development. Addressing this requires supportive strategies such as gradual food exposure and positive reinforcement. A multisensory plate, designed with compartments, animal prints, and audio feedback through sensors, helps engage children, encourage exploration of food, and promote healthy eating habits. This innovative tool supports balanced diets, positive mealtime behavior, and overall growth. **Aim:** To develop A Multi-Sensory Plate Among Pre-School Children with Picky Eating Behaviour **Methodology:** This study "Development of A Multi-Sensory Plate Among Pre -School Children with Picky Eating Behaviour-An Exploratory Experimental Study". A Convenient sampling method was adopted. Ten preschool children were included based on the inclusion and exclusion criteria for the study. Children aged between 3 -5 years were participated in this study. The preschool children were assessed using Behavioural Paediatric Feeding Assessment Scale (BPFAS). Demonstration of multisensory plate was given to the parents, teachers and children. Researcher collected consent and assent form from the institution and parents. The duration of the study period was one year with 6weeks of intervention. **Results:** Statistical analysis was conducted using an paired t-test to compare the mean scores of pre-test and post-test values of frequency and problem behaviours from Behavioural Paediatric Feeding Assessment Scale (BPFAS). After the intervention, the frequency scores decreased from 127.20 to 105.00. This reduction in the mean frequency score was found to be statistically significant. Additionally, the problem scores decreased from 28.4 to 18.6, and this reduction in the mean problem score was also found to be statistically significant. The p-value was 0.001 (≤ 0.05). Thus, the results indicate that the findings are extremely statistically significant **Conclusion:** This study concludes that introducing a multisensory plate result in a statistically significant increase in children's willingness to try new foods and a reduction in picky eating behaviours. Overall, there is a marked decrease in both frequency and problem scores between the pre-test and post-test results, indicating that this intervention is effective in enhancing food acceptance among preschool children. These findings suggest that a multisensory plate can be a valuable tool in improving dietary habits in early childhood.

Keywords: Picky eating behaviour, pre -school children, Multisensory plate.

INTRODUCTION

Picky eating in preschool children is a common issue that can affect growth, development, and overall well-being. It is characterized by reluctance to try new foods, preference for limited textures or flavors, and avoidance of fruits and vegetables, often leading to nutritional deficiencies, stunted growth, or delayed cognitive and motor skills. Causes include individual taste preferences, developmental changes, and sensory sensitivities. Addressing picky eating requires a multifaceted approach involving gradual exposure to foods, positive reinforcement, supportive mealtime environments, and active child participation in food choices. Parents, teachers, and therapists play a key role in creating engaging strategies, such as using multisensory plates with compartments, animal prints, and audio feedback to encourage exploration and healthy eating habits. Early intervention and tailored support are essential to promote balanced diets, positive mealtime behavior, and successful development.

METHODS

- **RESEARCH DESIGN:** Exploratory experimental study.
- **STATISTICAL TEST:** Paired t-test
- **SAMPLE SIZE:** 10 pre-school children
- **STUDY PLACE:** Kidzee Sholinganallur
- **DURATION OF THE STUDY:** Total duration of the study 1 year including 6 weeks of intervention

INCLUSION CRITERIA:

- Age range from 3-5 years
- Both gender
- History of persistent picky eating behaviour lasting greater than one month
- Cooperative parents/caregiver
- Children with similar taste preference

EXCLUSION CRITERIA

- Children below the age of 3 and above 5 years

- Children with medical conditions such as allergic to certain foods, or with bowel problems
- Children with developmental genetic/chromosomal abnormalities
- Children who have any other disability that might compromise their development
- **INDEPENDENT VARIABLE:** Multisensory plate
- **DEPENDENT VARIABLE:** Frequency and problem mealtime behaviour in pre-school children

TOOL DISCRIPTION:

The Behavioural Paediatric Feeding Assessment Scale (BPFAS)

- The behavioural paediatric feeding assessment scale is widely used parent report measure of

mealtime and feeding behaviour. It is a component in the Achenbach system of Empirically Based Assessment developed by Thomas M Achenbach in 1983. It consists of 35 items, the first 25 of which focus on child behaviour and the last 10 of which provide an index of parental feelings about, and strategies for, addressing mealtime and feeding problems. The parents are asked to indicate how often the behaviour occurs on a 5-point Likert scale. Greater overall scores indicate higher levels of problematic mealtime and feeding behaviour.

- Positively phrased items are reverse scored.
- Age range 9 month to 18 years

SCORING:

- If total frequency score > 84 then it is significantly higher than the normative data
- If total problem score > 9 then it is significantly higher than normative mean.

DATA COLLECTION PROCEDURE: Participants were selected based on inclusion and exclusion criteria .

- The parents are explained about the study and requested to sign the informed assent form.
- The Behavioural Paediatric Feeding Assessment Scale (BPFAS) was used to screen the participants.
- Ten pre-school children were participated in the study.
- Participants had a freedom of withdrawing from the study at any time without any Reason, and this would not affect their general programs in any way.
- Two Multisensory Plate was introduced to enhance their mealtime behaviour.
- The pre-test and post test score were collected and subjected to
- statistical analysis to Check the Effect of Development of A Multi- Sensory Plate Among Pre -School Children With Picky Eating Behaviour.
- Six weeks of duration, 4 days per week, 45 minutes per day.

S.no	WEEK	DAYS	FRUITS/SNACKS	VEGETABLES/ SNACKS
1	1	Day 3	Banana (F.O)	Dark Chocolate (F.O)
		Day 4	Apple (F.O)	Potatoes (F.O)
2	2	Day 5	Apple (F.O)	Potatoes (F.O)
		Day 6	Dark Chocolate (F.O)	Carrots (L.F)
		Day 7	Papaya (L.F)	Carrots (L.F)
		Day 8	Papaya (L.F)	Carrots (L.F)

3	3	Day 9	Apple (F.O)	Potatoes (F.O)
		Day 10	Papaya (L.F)	radish (F.H)
		Day 11	Grapes (F.H)	Carrots (L.F)
		Day 12	Grapes (F.H)	Beetroot (F.H)
4	4	Day 13	Grapes (F.H)	Potatoes (F.O)
		Day 14	Grapes (F.H)	Beans (F.H)
		Day 15	Mango (F.H)	Carrots (L.F)
		Day 16	Mango (F.H)	Beetroot (F.H)
5	5	Day 17	Banana (F.O)	Dark Chocolate (F.O)
		Day 18	Papaya (L.F)	Carrots (L.F)
		Day 19	Chikoo (F.H)	Bottle gourd (F.H)
		Day 20	Chikoo (F.H)	Bottle gourd (L.F)
6	6	Day 21	Grapes (F.H)	Beetroot (F.H)
		Day 22	Mango (F.H)	Cucumber (F.H)

F.O = favourite meal, L.F = least favourite meal, F.H= frequently hesitating meal

RESULTS

Statistical analysis was conducted using an paired t-test to compare the mean scores of pre-test and post-test values of frequency and problem behaviours from Behavioural Paediatric Feeding Assessment Scale (BPFAS). After the intervention, the frequency scores decreased from 127.20 to 105.00. This reduction in the mean frequency score was found to be statistically significant. Additionally, the problem scores decreased from 28.4 to 18.6, and this reduction in the mean problem score was also found to be statistically significant. The p-value was 0.001 (≤ 0.05). Thus, the results indicate that the findings are extremely statistically significant.

Tables and Figures:

Table: Comparison of BPFAS pretest and posttest frequency and problem behaviour mean score. Intra group comparisons:

		Mean	Std. Deviation	P value
Pair 1	BPFAS pretest frequency score	127.20	13.147	<0.001*
	BPFAS post test frequency score	105.00	16.228	
Pair 2	BPFAS pre test problem score	28.40	4.142	<0.001*
	BPFAS post test problem score	18.60	4.600	

DISCUSSION

The study showed that after using the multisensory plate, children's mean frequency scores reduced from 127.20 to 105.00 and problem scores from 28.4 to 18.6, both statistically significant ($p \leq 0.05$), indicating a decrease in mealtime behavioural issues and feeding-related stress. These findings align with previous studies by Katerina Sdravou et al. and Jeanne Marshall et al., which validated the use of parent-reported tools for assessing feeding difficulties in typically developing children. The intervention involved gradually introducing healthy snacks and vegetables through the multisensory plate, starting with familiar foods and progressing to less preferred options, while parents ensured food was appealing. Over time, children became more willing to try new foods and showed reduced picky eating behaviours, demonstrating the effectiveness of the multisensory plate in promoting healthier feeding habits and supporting long-term mealtime success.

CONCLUSION

This study concludes that introducing a multisensory plate result in a statistically significant increase in children's willingness to try new foods and a reduction in picky eating behaviors. Overall, there is a marked decrease in both frequency and problem scores between the pre -test and post-test results, indicating that this intervention is effective in enhancing food acceptance among preschool children. These findings suggest that a multisensory plate can be a valuable tool in improving dietary habits in early childhood.

Limitations and Recommendations

Limitations

- The present study was done with small sample size.
- Study involved only preschool children in Chennai.

Recommendations:

- A large sample size could be considered.
- Study can be done on different age groups.
- The present study can be performed for preschool children from different areas of the city.
- Wireless multi-sensory plate.

DECLARATION: The authors have no conflict of interest

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