



EFFECT OF FUNCTIONAL COMMUNICATION TRAINING, SENSORY INTEGRATION THERAPY AND BEHAVIOUR INTERVENTION FOR CHALLENGING BEHAVIOURS IN CHILDREN WITH AUTISM

RedkarSimranSandeep¹, Ganapathy Sankar.U^{1*}, Monisha.R³

1,2. SRM College of Occupational therapy, SRM Institute of Science and technology, SRM Nagar, Kattankulathur, 603203, Kancheepuram, Chennai Tamilnadu, India

Corresponding author mailing address: ganapatu@srmist.edu.in

Abstract

The study aims to compare the effect of Functional Communication Training, Sensory Integration Therapy and Behaviour Interventions for Challenging behaviours in children with autism. A total of sixty (N=60) children diagnosed with autism spectrum disorder exhibiting challenging behaviors were recruited for the study through convenience sampling. Amongst these, twenty (n=20) children were randomly assigned in one of the three groups (Functional communication training, sensory integration therapy & behavioural intervention). Functional behavioural analysis (FBA) and Repetitive behavior scale- Revised (RBS-R) were the outcome measures selected for pre and posttest analysis. The current study results showed that there was a clinically significant difference between the post test scores of the three groups (Mean value: BI 19.50, SIT 20, FCT 23), BI successfully reduced the frequency and occurrence of challenging behaviours significantly as compared to the other two groups. The study highlighted the domain of challenging behaviors in children with ASD & concluded that FCT, SIT and BI were effective Occupational therapy intervention strategies for managing such behaviours.

Key words: Autism spectrum disorder (ASD), Challenging behaviours, Sensory integration therapy (SIT), Functional communication training (FCT), Behavioural interventions (BI)

Introduction

Autism spectrum disorder (ASD) is a neurodevelopmental disorder classically appearing in the early childhood⁽¹⁾. It is known as a spectrum condition because of its uniqueness of

presentation in children at varying degree of complexity, symptoms and difficulties in everyday activities. It accounts to a lifelong course with difficulties arising at each stage. Autism spectrum disorder is however still not evident to have a certain etiological factor for its occurrence, but several genetic and environmental factors are known risk factors for the same. An estimated gender-based ratio for boys to girls is 4:1 respectively⁽²⁾.

Behaviours is an expressive act by an individual that takes various forms and meanings. They are actions, reactions and functioning in response to everyday functioning which depicts how a child conducts themselves whereas, challenging behaviours are used to describe behaviour that interferes with a child's daily life⁽³⁾. All children display a number of inappropriate or challenging behaviours as they grow up through various ages and stages of childhood⁽⁴⁾. All behaviours are said to have a cause or purpose. Behaviours are influenced by a number of factors, namely, internal factors (desire for control, poor sensory processing, poor self-regulation, pain, illness, ineffective communication, fatigue and poor emotional regulation) and external factors (task demands, unfamiliar place or person and change in schedule)⁽⁵⁾.

Restricted, repetitive patterns of behaviours, interest or activities are an important criterion-based features of autism spectrum disorder. These challenging behaviours are commonly seen in individuals demonstrating communication difficulties especially children with autism spectrum disorder⁽⁶⁾. Bright et al., (1981) reported that behaviours that are not achievable through adaptive response are inherently reinforced by tactile, proprioceptive and vestibular stimulation. Insufficient communication has a direct effect on the frequency and severity of challenging behaviours, which was more prevalent in children with developmental disabilities and autism spectrum disorder⁽⁷⁾. There are conclusions that almost 50% of the children with autism spectrum disorder have challenging behaviours to aid their communication by means of displaying them⁽⁸⁾. These

challenging behaviours are associated with functional difficulties. A study conducted on the contrast of Behavioural interventions and Sensory integration therapy on challenging behaviours in children with ASD concluded that Behavioural interventions yield more significant results than Sensory integration therapy⁽⁸⁾. However, the AB crossover design had its own limits in sequences of Behavioural and Sensory integration and also limited its scope with respect to the follow up of the participants. Reem et al in 2018 conducted a study to determine the effects of Functional communication training using an iPad application on challenging behaviours in children with ASD. This study proposed its limitation with respect its social validity and methodological variations.

The existing literature fails to abide to the theoretical base of Sensory integration as it focuses more on sensory stimulation strategies than sensory integration strategies. There is a significant evidence of inconsistency of potential success of the behavioral interventions over Sensory Integration Therapy⁽⁹⁾. Additionally, the available evidence has either only compared the efficacy of each type of intervention or an intergroup intervention. There is no study comparing the effectiveness of these three interventions yet⁽¹⁰⁾. The present study aims to compare the effectiveness of Functional communication training, Sensory integration therapy and Behavioural interventions on challenging behaviours in children with autism spectrum disorder.

Methodology

The present study obtained its ethical approval from the institutional committee of SRM Medical College & Research Centre, SRMIST, Kattankulathur, Chengalpattu. Ethical clearance number: 2085/IEC/2020. The research design adapted in the study is an Experimental pre posttest design. Approval of the ethical committee of SRM Medical College & Research Centre, SRMIST, Kattankulathur, Chengalpattu was obtained. The preliminary plan for the study included a total of N=60 children (n=20 in each group: SIT,

FCT, BIT) with ASD exhibiting challenging behavior. The Purpose of the study was explained in detail to the parents following which a written consent was obtained from them. A functional behavior analysis was conducted where the children were observed for 30 minutes as a preliminary measure for observing challenging behaviours. RBS-R was the outcome measure used to assess the challenging behaviours. Children were then randomly assigned to one of the 3 groups (SIT, FCT and BI). Group A, B and C, which were Sensory Integration therapy, Functional communication training, and Behavioral interventions respectively. This was the baseline established for the pre-test.

Study was conducted at SRM College of Occupational Therapy, OP department (Sensory integration therapy) for 12 weeks (3 days per week, 45 minutes session) while, functional communication training and behavioral interventions (3 days per week for 4 weeks) were conducted at the child's home due to restrictions of COVID-19 pandemic. Posttest scores were then calculated following the interventions given for a period of 12 weeks. The intervention program for each of the participant was individualized based on his/her underlying challenging behaviours. The principle of each of the intervention was based on the child's underlying challenging behavior for which an individualized occupational therapy intervention program was administered. Each participant then received interventions respective of the groups they were placed in.

Group A received Sensory integration therapy (SIT) as the mode of intervention (Ayres, 1972; Elizabeth et al., 2019; Melissa, 2009; Sinclair et al., 2005) for the challenging behaviours implemented for 45 minutes based on the underlying sensory functioning abnormalities for a period of 12 weeks (thrice a week).

Group B received Functional communication training (FCT) as the mode of intervention for the challenging behaviours (Carr & Durand, 1985; Danielle, 2019; Reem et al., 2018; Miriam et al., 2015; Jeffrey, 2008; Melissa et al., 2008). FCT consisted of implementation of the use of application of use of pictures to communicate. **Group C** received Behavioral interventions as a mode of intervention for their challenging behaviours in the form of reinforcement strategies through positive, negative and automatic reinforcement (Helena et al., 2017; Janine et al., 2014; Susan, 2012; Sarah et al., 2010)

Data analysis

TableNo.1: Effectiveness of SIT, FCT and BI on challenging behaviours in children with ASD on the RBS-R

Group	Test	Mean	SD	z value	p value
SIT	Pre	31.00	2.828	-1.342	0.180 NS
	Post	20.00	1.414		
FCT	Pre	27.50	14.849	2.035	0.041 S
	Post	23.00	11.314		
BI	Pre	40.00	15.556	2.252	0.024 S
	Post	19.50	12.021		

$p \leq 0.05$

Wilcoxon signed-rank test was used to compare the within group analysis on the effect of SIT, FCT and BI in reducing the challenging behaviours. The results indicated that there was no statistically significant difference between the pre and post test scores of groups 1: SIT ($z = -1.342, p = 0.180$), while a statistically significant difference was seen between the pre and post test scores in group 2: FCT ($z = 2.035, p = 0.041$) and in group 3: BI ($z = 2.252, p = 0.024$).

TableNo.2: Comparison of pre-test scores on RBS-R on SIT, FCT and BI on challengingbehaviours

Group	Mean	SD	z value	p value
SIT	31.00	2.828	0.515	0.773
FCT	27.50	14.849		NS
BI	40.00	15.556		

$p = \leq 0.05$

Kruskal Wallis test was used to compare the pre-test scores for between group analysis on the effect of SIT, FCT and BI in reducing the challenging behaviours. The results indicated that there was no statistically significant difference between the pre- test scores of all three groups: SIT, FCT and BI ($z = 0.515$, $p = 0.773$).

TableNo.3: Comparison of post test scores on RBS-R of SIT, FCT &BI

Group	Mean	SD	z value	p value
SIT	20.00	1.414	1.986	0.047
FCT	23.00	11.314		S
BI	19.50	12.021		

$p = \leq 0.05$

Kruskal Wallis test was used to compare the post-test scores for between group analysis on the effect of SIT, FCT and BI in reducing the challenging behaviours. The results indicated that there was a statistically significant difference between the post- test scores of all three groups: SIT, FCT and BI ($z = 1.986$, $p = 0.047$).

Discussion

The present study aimed to determine the effectiveness of functional communication training (FCT), sensory integration therapy (SIT), and behavioral interventions (BI) on challenging behaviours in children with autism spectrum disorder. The prime objective of this study was to identify participants who are diagnosed with ASD showing presence challenging behaviours which impair their everyday functioning and to compare the effectiveness of Sensory integration therapy (SIT), Functional communication training (FCT) and Behavioral interventions (BI) in reducing these behaviours.

The ages of the children with autism spectrum disorder included for the study ranged from 6-12 years. The challenging behaviours of each child was noted and the effectiveness of the intervention was studied.

Table No. 1 depicted the effectiveness of SIT, FCT & BI on reducing the challenging behaviours. The pre test scores between the three groups however did not reveal a statistically significant value, while the post test scores between the three groups did reveal a statistically significant which demonstrate its effectiveness. The within group analysis of the three groups although revealed a difference in the mean values, which signifies a clinically significant value; however, the p value of SIT was non-significant and that of the other two groups (FCT and BI) showed statistically significant scores respectively. Table No. 2 and 3 shows difference in mean value in the pre and post test scores on RBS-R with a statistically significant value. The basis behind administering behavioral interventions is that all behaviours are determined by causes. Such behaviours are intended to be developed and maintained by reinforcements: positive, negative and automatic⁽¹¹⁾. Behavioral interventions yielded the most positive results and reduced the

occurrence of challenging behaviours⁽¹²⁾. The current study agrees to the study previously conducted by Susan (2012) revealed that behavioral intervention is effective in intervening self-injurious behaviours in children with ASD. Behavioral strategies incorporated in the form of reinforcement based, extinction strategies and alternating stimuli were accounted to be beneficial strategies to reduce such behaviours⁽¹³⁾.

The current study compared three groups (SIT, FCT, BI) for reducing the occurrence of challenging behaviours participants with ASD. The results in the current study are similar to the study conducted by Helena (2017); Olive (2010); Mason & Iwata (1990) which compared the effectiveness of two interventions (SIT and BI) on reducing the occurrence of challenging behaviours in children with ASD. The current study indicated that BI was more beneficial in reducing these behaviours than SIT. Our current study too has accounted a more reduction in the frequency of challenging behaviours both on FBA and RBS-R in its post-testanalysis.

The current study results revealed that behavioral interventions (Clinical difference in the mean values: BI 19.50, SIT 20, FCT 23) was a more beneficial intervention for reducing the occurrence of challenging behaviours as compared to sensory integration therapy and functional communication training.

Conclusion

Challenging behaviours are one of the most confounding factors which limit the independency of children with autism spectrum disorder in all settings. Sixty (N=60) children diagnosed with autism spectrum disorder in the age range of 6-12 years, exhibiting challenging behaviours were recruited for the study through convenience sampling and were randomly assigned to one of the three groups (SIT, FCT and BI). The intervention was provided for a period of 12 weeks and the pre-post-test analysis was done

by using FBA and RBS-R. The results of the study indicated that there was a clinically significant difference post intervention which revealed that BI were the most beneficial than SIT and FCT. Further analysis revealed that there was an overall decline in the frequency of challenging behaviours exhibited by the children with ASD.

References

1. American Occupational Therapy Association. (2014). Occupational Therapy practice framework: Domain and process (3rd ed.). American Journal of Occupational Therapy, 68(Suppl. 1), S1– S48.
2. Anita C. Bundy. Sensory Integration: A. Jean Ayres' Theory Revisited. In: Anita
3. C. Bundy, Shelly J. Lane, Shelley Mulligan, Stacey Reynolds. Sensory Integration Theory and Practice, (3rd ed.). 2020 F.A Davis, Philadelphia.
4. Goldschmidt J. (2016) What happened to Paul? Manifestation of abnormal pain response for individuals with autism spectrum disorder. Qualitative Health Research 27, 1133–45.
5. Horvath, K., Papadimitriou, J. C., Rabszty, A., Drachenberg, C., & Tildon, J. T. (1999). Gastrointestinal abnormalities in children with autistic disorder. Journal of Pediatrics, 135, 559–563.
6. Carr, E. G., & Durand, V. M. (1985). Reducing problem behaviours through functional communication training. Journal of Applied Behavior Analysis, 18, 111–126. Carr, E. G., & Durand, V. M. (1985). Reducing problem behaviours through functional communication training. Journal of Applied Behavior Analysis, 18, 111–126.
7. Sankar U. G, Monisha R. Life Impact of Developmental Coordination Disorder: Qualitative Analysis of Patient and Therapist Experiences. Biomed Pharmacol J 2019;12(1).
8. David M Cutler. (2004). In: Behavioral Health Interventions: What Works and Why? Critical Perspectives on Racial and Ethnic Differences in ealth in Late Life.
9. Smith, B., & Fox, L. (2003). Systems of service delivery: A synthesis of evidence relevant

- to young children at risk of or who have challenging behavior. Tampa: Center for Evidence-Based Practice, Young Children with Challenging Behavior, University of South Florida.
10. Tomchek, S. (2010). Sensory Processing in individuals with an autism spectrum disorder. In H. Miller Kuhaneck & R. Watling (Eds.) *Autism: a comprehensive occupational therapy approach* (3rd ed., pp. 135-162).
 11. Emerson, E. (2000). *Challenging behavior: Analysis and intervention in people with intellectual disabilities* (2nd ed.). Cambridge, England: Cambridge University Press.
 12. Helena Lydon, Olive Healy, Ian Grey (2017). Comparison of behavioral intervention and sensory integration therapy on challenging behavior of children with autism. *Behavioral Interventions*. 2017;1–14
 13. Sarah Devlin, Olive Healy, Geraldine Leader, Brian M. Hughes (2011). Comparison of Behavioral Intervention and Sensory-Integration Therapy in the Treatment of Challenging Behavior. *Journal of Autism Developmental Disorders* (2011) 41:1303–1320