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Integrating Occupational Therapy with Technology to Enhance Occupational Functioning in an Adolescent with Conduct Disorder Along with ADHD and Primary Nocturnal Enuresis - A Case Report

Dr. Bhagyashree B Risbud[1], Dr. Karuna Nadkarni[2]

[1] Final year MOT student (Mental Health Sciences), Seth GSMC and KEM Hospital, Department of Occupational Therapy, Mumbai.
[2]Faculty and PG Guide (Mental Health Sciences), Seth GSMC and KEM Hospital, Department of Occupational Therapy, Mumbai.

Corresponding Author: Dr. Bhagyashree B Risbud

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ABSTRACT

The global burden of Conduct Disorder and Attention Deficit/Hyperactivity Disorder is significant, particularly in male children. The comorbidity of the two disorders seems to combine the worst features of both disorders. As both the conditions significantly impacts occupational functioning, it highlights the necessity for specialized intervention. This case report aims to contribute to the limited evidence base by integrating occupational therapy with technology to address difficulties in daily occupations in these co-morbid conditions. One male subject was recruited in the Outpatient Department, Occupational Therapy unit at KEM Hospital.The SCOPE, ESQ, and MOAS scores were evaluated at baseline and following the 6-months intervention. Intervention was based on Model of Human Occupation, Motivational Interviewing and behavioural approaches along with the use of technology. Findings showed increased SCOPE and ESQ scores, and decreased MOAS scores, indicating improvements in behaviour, executive functioning and occupational participation. Hence, this case report illustrated the effectiveness of combining Occupational Therapy with technology to improve overall occupational functioning in an adolescent with co-morbid conditions.

Keywords: *Conduct Disorder, Attention Deficit/Hyperactivity Disorder, Technology, MOHO, Xbox Kinect 360, SCOPE*

INTRODUCTION

Attention Deficit/Hyperactivity Disorder (ADHD)

Attention-deficit/hyperactivity disorder (ADHD) is a common and serious behavioral disorder [3]. In the Indian scenario, the pooled prevalence of ADHD based on meta-analysis is 7.1% [13]. The main problems associated with ADHD are hyperactivity, inattention, and impulsiveness [2]. The behavioral characteristics of it have a clear relationship with defects in executive function [2].

Significantly impaired cognitive, family, school, and psychosocial functioning have been observed in adolescents with persistent ADHD [1]. Research states that defective

executive function affects aspects of occupational function [2]. Studies also indicate that patients with ADHD are at risk for developing comorbidities like oppositional defiant disorder (ODD), conduct disorder (CD), and depression [1]

Conduct Disorder (CD)

According to Diagnostic and Statistical Manual of Mental Disorders (DSM-V), Conduct Disorder (CD) is one of the important forms of mental health problems in children and adolescents [5]. The prevalence of Conduct disorder in India varies across studies, but generally falls within the range of 4.5% to 14.5% [14-19]. Conduct disorder (CD) often emerges in childhood or adolescence and is characterized by behaviours that violate the rights of others, such as physical aggression towards people or animals, theft, property damage and rule violations [6]. It is a disabling disorder that must cause clinically significant impairment in social, academic, or occupational functioning [5]. Adolescents with conduct disorder have impaired socio-affective processing and cognitive control [4]

The global burden of CD and ADHD is significant, particularly in male children [8]. The comorbidity of the two disorders seems to combine the worst features of both disorders [7].

As both the conditions significantly impacts occupational functioning, it highlights the necessity for specialized intervention. This case report aims to contribute to the limited evidence base by integrating occupational therapy with technology to address difficulties in daily occupations in these co-morbid conditions.

MATERIALS & METHODS

Patient Information-

The patient is a 14-year-old male adolescent, currently attending schooling, was diagnosed with attention deficit hyperactivity disorder (ADHD) at the age of 6, presenting with hyperactivity, inability to remain seated, and aggressive behaviours such as biting. Pharmacological management was initiated at the time, with noted symptomatic improvement. However, treatment was abruptly discontinued following a school transfer to a distant boarding facility, where the principal reportedly discouraged medication use, labelling it as appropriate only for "mental patients."

Since the age of 12, the patient started exhibiting behavioural concerns consistent with Conduct Disorder. For the past two years, the mother has reported that the patient exhibited frequent anger outbursts, verbal threats, and physical aggression directed at her. Over the past year, he has demonstrated cruelty towards animals. She also noted that the patient frequently engages in physical altercations with peers, often triggered by trivial disagreements. The patient has strained relationship with his younger sister, with frequent physical fights occurring between them. He has also showed decreased interest in performing his daily living activities in form of not brushing regularly, skipping a regular bath, not coming home on time followed by skipping his meals and not attending his regular schooling. He also has frequent bedwetting at night. These behaviours have been persistent across environments, contributing to significant social, academic, and familial dysfunction. Due to the above concerns, he was admitted in psychiatry inpatient department at KEM hospital.

Family Background-

The patient lost his father to oral cancer when he was 3 years old. He currently resides with his mother and younger sister. Similar behavioural traits were observed in the patient's older brother, who has since left the family home, now lives independently, and is currently employed. The presence of similar patterns in the sibling suggests a possible familial or genetic predisposition. The overall family dynamics appears strained, with multiple instances of intra-familial conflict and a history of disrupted treatment

due to environmental and psychosocial factors.

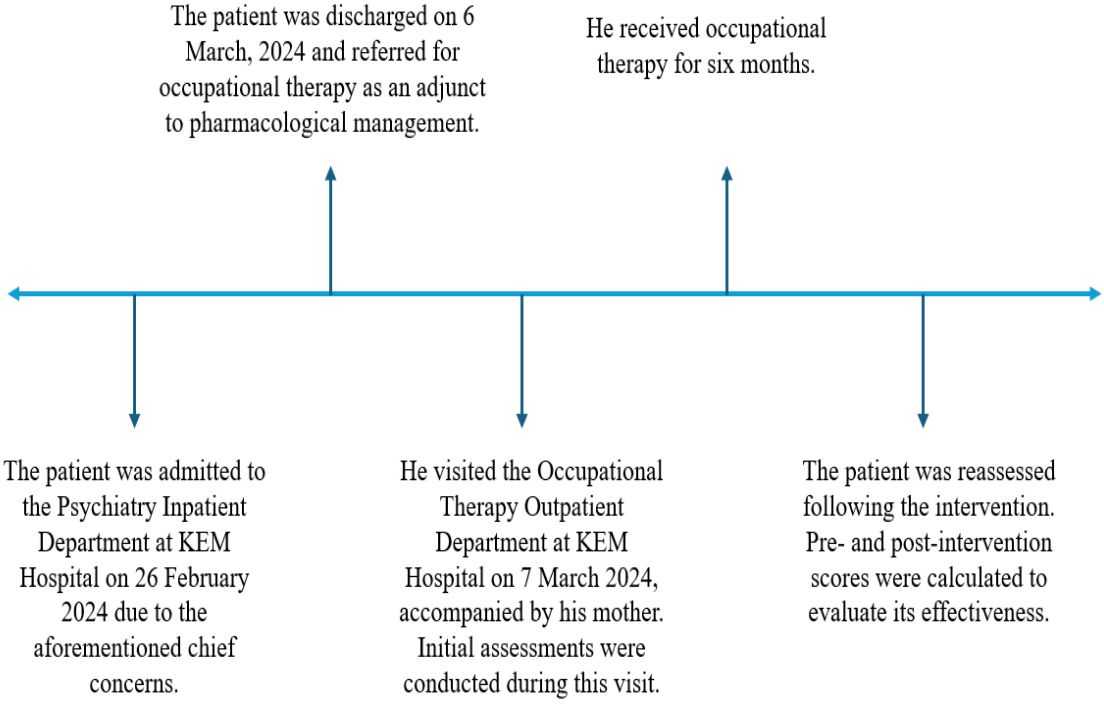
According to Mental Status Examination

I. Appearance	Dishevelled
II. Attitude towards examiner	Restless, defiant at times
III. Eye contact	Established but not maintained
IV. Behaviour	Impulsive, and aggressive behaviour towards the therapist was observed. Psychomotor agitation was observed. Difficulty remaining seated (sat only for 5 minutes) or following instructions.
V. Speech	Pressured
VI. Mood	Irritable
VII. Affect	labile or incongruent with the surroundings
VIII. Thought	Coherent and continuous
IX. Attention/Concentration	easily distracted, cannot sustain focus
X. Orientation	present
XI. Memory	Retention and recall is affected
XII. Insight	Level III
XII. Judgment	Social- impaired, test- present

Based on the identified problem areas, the patient was assessed on the Short Child Occupational Profile (SCOPE), Executive Skills Questionnaire for parents/teachers (ESQ), and Modified Overt Aggression Scale (MOAS), and were selected as outcome measures. Pre- and post-intervention scores were analyzed.

Timeline-

Following figure shows the timeline of the patient's intervention period.



Diagnostic Assessment-

Diagnostic assessments were conducted by the psychiatrist. The patient was diagnosed as Conduct disorder with ADHD along with primary nocturnal enuresis.

Therapeutic Intervention-

Occupational therapy intervention was implemented for over a period of six months, once a week, comprising individualized and group-based sessions for duration of 45 minutes. The intervention consisted as follows:

Intervention	Strategies
Motivational Interviewing	The Decisional Balance Grid exercise was implemented to enhance the patient's awareness of the discrepancy between his current neglect of self-care activities (bathing and brushing) and the potential benefits of maintaining regular self-care routines.
MOHO	Tablet games and meaningful activities of his choice were incorporated to build interest in the therapy session, to build a sense of autonomy and achievement. The therapist helped the patient to make a structured routine by helping him identify the necessary tasks and incorporating them with the help of his mother. Structured bed-time routine was also incorporated to decrease his incidence of bedwetting. Participation was encouraged in age-appropriate activities to develop his roles. Family members were psycho-educated regarding the diagnosis and the symptoms of the patient and how to deal effectively with him.
Behaviour Modification	Strategies like positive reinforcement and token economy were incorporated to help in maintaining his routine. Strategies like 'One Minute Counselling Technique [20] and Walking Through Technique [20], were incorporated by his mother to improve his engagement in self-care and prosocial activities.
Xbox Kinect 360	Tai Chi was given on it to improve his executive functions and emotional regulation.
Tablet based games	It was used as a therapeutic tool to build interest and develop rapport initially, later it was used to improve executive functions and as a part of leisure.
Group Therapy	Group therapy was conducted with his family members, with the therapist and with other patients of his age in the OPD environment. Social skills training was incorporated for helping the patient manage his anger by role playing and assertiveness training, to develop impulse control, to improve his communication skills with the family members and to improve his engagement in prosocial activities.

RESULT

Outcome measures were assessed after six months, which showed significant improvements in The Short Child Occupational Profile (SCOPE), Executive Skills Questionnaire (ESQ) and Modified Overt Aggression Scale (MOAS). The pre-test SCOPE classified the patient as 'Inhibits', while the post-test classified him as 'Allows'. The ESQ indicated improved executive functioning, and the MOAS showed reduced aggression post-intervention. The following Tables and Bar graphs shows the data analysed.

Components	Pre- score	Post-score
Volition	7	12
Habituation	6	13
Communication and interaction skills	8	12
Process skills	7	13
Motor skills	12	16
Environment	17	18

Table 1- SCOPE

Components	Pre- score	Post- score
Response Inhibition	7	11
Working Memory	3	8
Emotional Control	3	8
Sustained Attention	3	6
Task Initiation	3	8
Planning/Prioritization	3	7
Organization	3	9
Time Management	3	8
Goal-Directed Persistence	3	9
Flexibility	3	5
Metacognition	3	6

Table 2- ESQ

Categories	Pre-score	Post - score
Verbal Aggression	3	1
Aggression against property	8	0
Autoaggression	6	0
Physical aggression	12	0
Total Weighted score	29	1

Table 3- MOAS

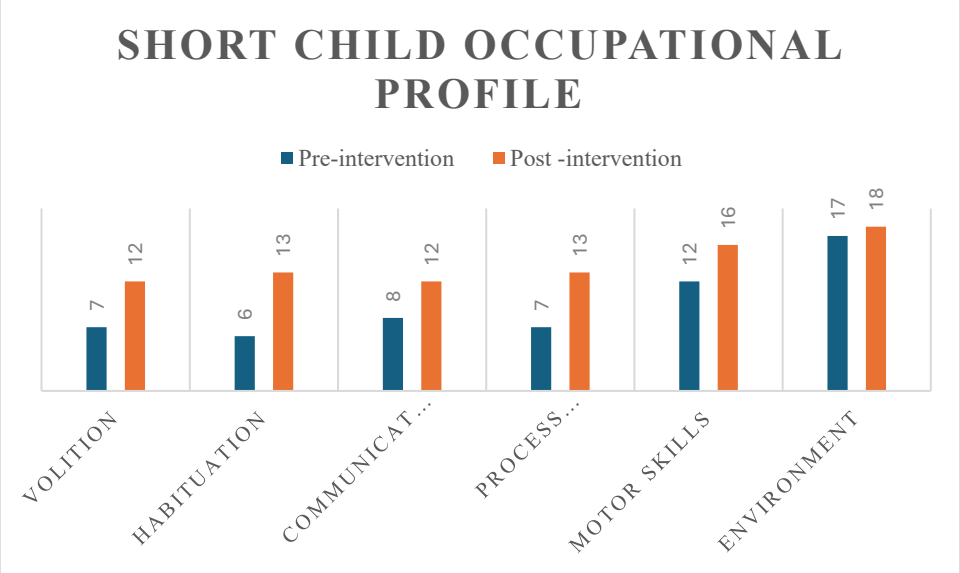


Figure 1

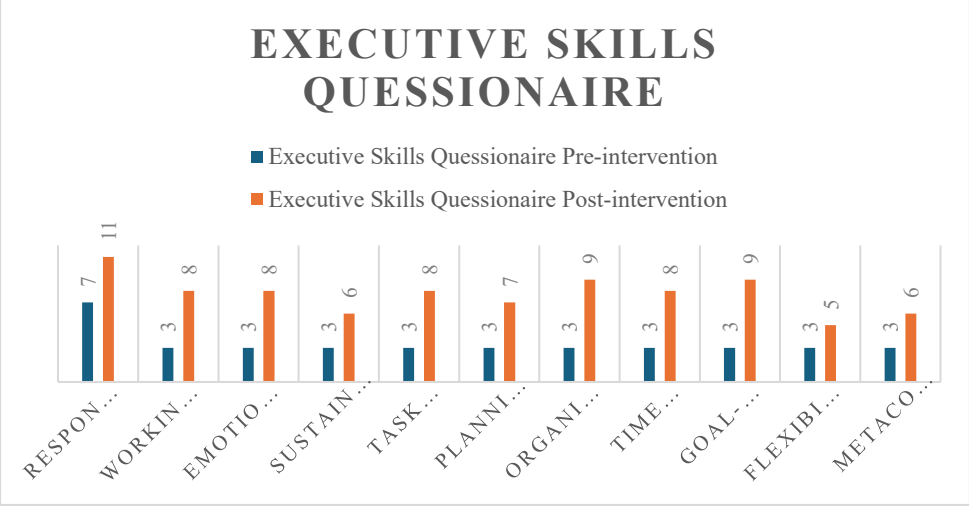


Figure 2

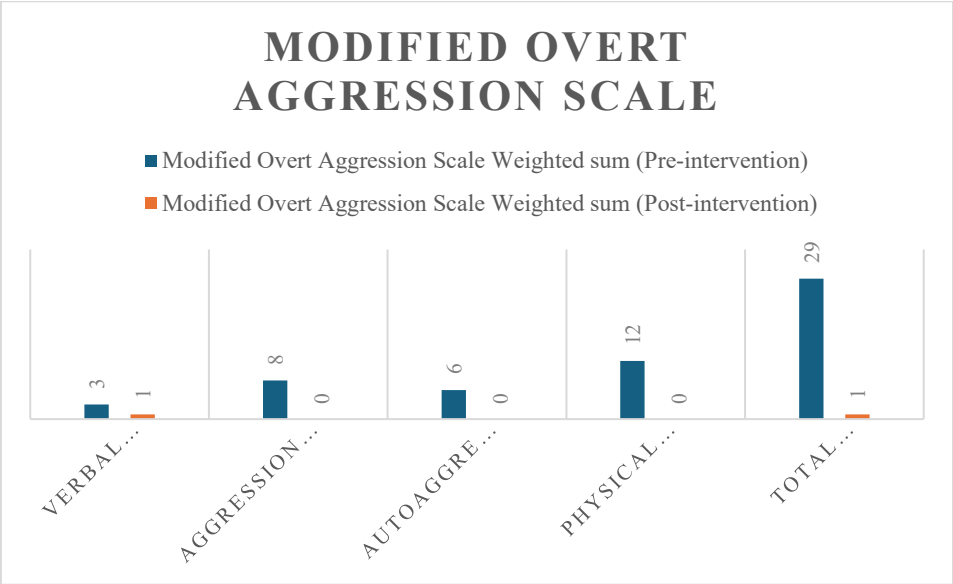


Figure 3

DISCUSSION

This case highlights the effectiveness of integrating occupational therapy with tablet-based games and Xbox Kinect 360-facilitated Tai Chi for a patient with Conduct Disorder and ADHD.

Post-intervention analysis of the SCOPE scores demonstrated positive outcomes. SCOPE scores were increased across all domains (Table 1 & Figure 1), indicating improvements in occupational performance and engagement, suggesting the effectiveness of the MOHO-based approach. Research states that because a case study allows the exploration and understanding of complex issues, MOHO deems to be a solid basis and appropriate theory to work on the case studies [10]. A study reports about a 6-week newspaper treatment group, in which the goals were related to volition, habituation, and performance, was found to be effective for adolescent with conduct disorder [12].

Similarly, the ESQ scores (Table 2 & Figure 2) showed significant improvement, reflecting the success of the technology-based intervention in addressing executive function deficits.

The studies also consistently demonstrate significant improvements in attention spans among ADHD children across various gaming interventions [11].

In addition, the Modified Overt Aggression Scale (MOAS) scores showed a marked reduction in total weighted scores following the intervention (Table 3 & Figure 3). This suggests that the combination of group therapy sessions and 12 sessions of Tai Chi conducted through Xbox Kinect 360 contributed effectively in reducing aggressive behaviours. Research also states that after the 10 Tai Chi sessions the adolescents displayed less anxiety, improved conduct, less daydreaming behaviours, less inappropriate emotions, and less hyperactivity [9]. A randomized study on parent management training (PMT) has shown decrease in the child conduct problem reported by mother [12]. The researcher concluded that behavioral and cognitive-behavioral group-based parenting interventions are effective [12].

Overall, the holistic approach proved beneficial in enhancing the functional outcomes.

LIMITATIONS

This case report is limited by its single-subject design, which restricts generalizability. Objective post-intervention neuropsychological assessments were not included, and outcome measures were primarily based on caregiver reports. Further

research is needed to evaluate long-term outcomes and broader applicability.

CONCLUSION

This case report illustrated the effectiveness of combining Occupational Therapy with technology to address complex comorbid conditions. The intervention led to measurable improvements in executive functioning, behavioural outcomes, and participation in daily activities, reflecting a significant impact on overall occupational functioning.

PATIENT PERSPECTIVE

The patient reported enjoying the use of tablet-based games and Tai Chi sessions, describing them as "fun" and "better than regular classes." Participation in group activities was initially challenging but later described as "less stressful" and "more comfortable," particularly when done with peers. He also noted feeling "less angry" and more "in control" during emotionally triggering situations by the end of the intervention period. His mother also experienced that interpersonal relationship is improved with him, he follows his routine consistently and his academic grades have improved.

INFORMED CONSENT

Informed consent was obtained from the patient's legal guardian for participation in the intervention and for the inclusion of anonymized data in this report.

Declaration by Authors

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Conflict of Interest: The authors declare no conflict of interest.

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