Original Researcher Article

Effect of Dance Movement Therapy (DMT) on Repetitive and Restricted Behaviors among Children with Moderate Autism

Sudhaker Gangadevi[1], Somasekhara Naraganti[2]

[1]Research Scholar (PhD Psychology), Bharatiya Engineering Science and Technology Innovation University, (BESTIU), Gorantla, Sri Sathya Sai District, Andhra Pradesh, India

[2]Assistant professor in Psychology, Bharatiya Engineering Science and Technology Innovation University (BESTIU), Gorantla, Sri Sathya Sai District, Andhra Pradesh, India

ABSTRACT

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition characterized by difficulties in social interaction, communication, learning, and behavior. Although ASD can be diagnosed at any stage of life, it is classified as a developmental disorder because symptoms typically emerge during early childhood, usually within the first two years. One of the core features of autism includes repetitive and restricted patterns of behavior, such as stereotyped movements, self-injurious actions, compulsive behaviors, insistence on sameness, ritualistic activities, and restricted interests.

The present study aimed to examine the effectiveness of Dance Movement Therapy (DMT) in reducing repetitive and restricted behaviors among children with moderate autism. The sample comprised eight children diagnosed with moderate ASD, aged between 5 and 10 years, recruited from special schools and child development centers in Chandanagar, Hyderabad. Both therapists and parents participated in a structured movement-based intervention program consisting of fifteen sessions of 45 minutes each, conducted over a period of three months.

To assess the impact of the intervention, the Repetitive Behavior Scale–Revised (RBS-R) was administered to parents before and after the intervention. The scale assessed six subdomains: stereotyped behavior, self-injurious behavior, compulsive behavior, ritualistic behavior, sameness behavior, and restricted behavior. Statistical analysis using mean scores, standard deviation, and paired t-tests revealed significant reductions in repetitive behavior subscales, including stereotyped, self-injurious, and compulsive behaviors. Similarly, significant improvements were observed in restricted behavior subscales such as ritualistic behavior, insistence on sameness, and restricted behaviors.

Overall, the findings indicate a significant reduction in repetitive and restricted behaviors among children with moderate autism following the Dance Movement Therapy intervention. The study provides empirical support for the effectiveness of movement-based therapeutic approaches as a beneficial intervention for managing core behavioral symptoms of autism.

Keywords: Autism Spectrum Disorder, Repetitive and Restricted Behaviors, Dance Movement Therapy (DMT).

1. INTRODUCTION:

Autism Spectrum Disorder (ASD) is a lifelong neurodevelopmental condition characterized by persistent deficits in social communication and social interaction, along with restricted and repetitive patterns of behavior, interests, or activities (American Psychiatric Association [APA], 2013). Difficulties in nonverbal communicative behaviors—such as limited eye contact, atypical facial expressions, impaired use of gestures, and poorly integrated verbal and nonverbal communication—significantly affect social reciprocity and functional participation in daily life. These challenges are often evident during early childhood and become more pronounced as developmental demands increase.

Among the core diagnostic features of ASD, repetitive and restricted behaviors (RRBs) constitute a critical yet underexplored domain, particularly in children with moderate autism. RRBs include stereotyped motor movements, self-injurious behaviors, compulsive acts, ritualistic behaviors, insistence on sameness, and restricted interests (Turner, 1999). These behaviors frequently emerge during early developmental stages and may intensify in response to stress, sensory overload, or environmental changes. Research indicates that RRBs interfere with adaptive functioning, learning processes, and social engagement, thereby limiting the acquisition of essential life skills and independence (Bodfish, Symons, Parker, & Lewis, 2000).

Children with moderate autism often present with pronounced deficits in social communication and interaction, accompanied by persistent RRBs that are resistant to change. These behaviors are frequently purposeless, repetitive, and rigid, and they disrupt daily routines, academic engagement, and social participation. Moreover, RRBs significantly affect the quality of life of children and impose an additional psychological, emotional, and caregiving burden on families (Gabriels et al., 2005). Despite their clinical significance, RRBs have received comparatively less attention in intervention

research than social and communication impairments, particularly in moderate autism.

Research indicates that high early screen exposure is significantly associated with language delays, social withdrawal, and repetitive behaviors, with daily screen time and limited parental engagement identified as key predictors of virtual autism symptoms, emphasizing the importance of parental awareness, digital hygiene, and early intervention (Vidhupriya et al., 2025). Similarly, toddlers exposed to more than two hours of daily screen time show reduced eye contact, joint attention, and symbolic play compared to those with minimal exposure (<30 minutes/day), suggesting that excessive early screen use may hinder socio-communicative development and functional play (Mallikarjuna et al., 2025). Additionally, children with Autism Spectrum Disorder consistently exhibit deficits in executive functions—including working memory, inhibitory control, and cognitive flexibility—which adversely affect academic performance, behavior regulation, and social functioning, highlighting the critical need to examine executive processes to better understand their functional challenges (Jagruth et al., 2021).

Behavioral and structured interventions have demonstrated some effectiveness in managing RRBs; however, these approaches often emphasize compliance and external behavior regulation, sometimes overlooking emotional expression, body awareness, and intrinsic motivation (Leekam, Prior, & Uljarević, 2011). There is a growing recognition of the need for holistic, child-centered interventions that integrate emotional, sensory, and motor experiences while addressing core behavioral symptoms of autism.

Dance Movement Therapy (DMT) is an expressive, body-based psychotherapeutic approach that utilizes movement as a primary medium for emotional expression, self-regulation, and interpersonal connection. Rooted in the principle that movement reflects internal psychological states, DMT facilitates the integration of physical, emotional, cognitive, and social functioning (Payne, 2006). For children with autism, DMT provides a nonverbal, sensory-rich, and developmentally appropriate platform to explore self-expression and relational engagement.

Key DMT techniques such as mirroring, movement synchrony, rhythm, and shared movement experiences have been shown to enhance emotional attunement and social connectedness. Fitzpatrick (2018) emphasized that mirroring in DMT enables children with ASD to develop awareness of their own movements and emotions while fostering social learning. Similarly, Manders and Goodill (2018) reported improvements in interaction quality and social synchrony among adolescents and adults on the autism spectrum through movement-based interventions. Fischman (2009) highlighted that techniques such as shadowing, echoing, and mirroring promote socialization by allowing children to refine movement patterns and develop relational awareness.

Empirical evidence further suggests that DMT positively influences communication skills, body attitude, emotional regulation, and self-awareness in children with autism.

Sen Gupta and Banerjee (2020) demonstrated improvements in communication and body awareness following DMT interventions. Additionally, Koegel, Vernon, Koegel, Koegel, and Paullin (2011) emphasized the importance of relational movement experiences in supporting developmental engagement and adaptive functioning in autism.

Despite the growing body of literature supporting the benefits of DMT for social and emotional outcomes, limited research has specifically examined its impact on repetitive and restricted behaviors, particularly among children with moderate autism. Furthermore, there is a notable lack of empirical studies conducted within the Indian context, where culturally responsive, play-based, and family-inclusive interventions are critically needed.

Therefore, the present study aims to examine the effect of Dance Movement Therapy on reducing repetitive and restricted behaviors among children with moderate autism. By addressing a significant gap in existing literature, this study seeks to contribute evidence supporting DMT as a collaborative, joyful, and holistic intervention. The findings are expected to provide valuable insights for clinicians, educators, and caregivers, and to promote movement-based therapeutic approaches as an effective strategy for managing core behavioral symptoms of autism in Indian children.

2. METHODOLOGY

Aim of the Study

The present study was undertaken to examine the effect of Dance Movement Therapy (DMT) on reducing repetitive and restricted behaviors (RRBs) among children with moderate autism.

3. OBJECTIVES OF THE STUDY

To develop a structured Dance Movement Therapy package aimed at reducing repetitive and restricted behaviors in children with moderate autism.

To assess the effectiveness of DMT in reducing stereotyped behaviors.

To examine the effect of DMT on self-injurious behaviors.

To evaluate the impact of DMT on compulsive behaviors.

To study the effect of DMT on sameness behaviors.

To assess the effectiveness of DMT in reducing ritualistic behaviors.

To examine the effect of DMT on restricted behaviors among children with moderate autism.

Hypotheses

There would be a significant difference between pre-test and post-test scores on the overall repetitive and restricted behavior domain following the DMT intervention.

There would be a significant difference between pre-test and post-test scores on stereotyped behaviors.

There would be a significant difference between pre-test and post-test scores on self-injurious behaviors.

There would be a significant difference between pre-test and post-test scores on compulsive behaviors.

There would be a significant difference between pre-test and post-test scores on sameness behaviors.

There would be a significant difference between pre-test and post-test scores on ritualistic behaviors.

There would be a significant difference between pre-test and post-test scores on restricted behaviors.

Research Design

A pre-test and post-test quasi-experimental research design with a single group was employed to evaluate the effectiveness of the Dance Movement Therapy intervention.

Sample and Locale

The sample comprised eight children diagnosed with moderate autism, aged between 5 and 10 years. The participants were selected from a special school affiliated with the National Institute for Empowerment of Persons with Intellectual Disabilities (NIEPID), Secunderabad.

Sampling Technique

The purposive sampling technique was used to select participants who met the inclusion criteria of the study.

Inclusion and Exclusion Criteria

The study followed clearly defined inclusion and exclusion criteria to ensure the selection of an appropriate and homogeneous sample. The inclusion criteria comprised children diagnosed with moderate autism, falling within the age range of 5 to 10 years. Both verbal and non-verbal children were included to capture a broader representation of communication abilities. Additionally, only children with adequate motor abilities were selected, enabling them to actively participate in and benefit from movement-based therapeutic activities.

The exclusion criteria included children who were receiving medication at the time of the study, as pharmacological intervention could influence behavioral and therapeutic outcomes. Children diagnosed with severe autism or Attention Deficit Hyperactivity Disorder (ADHD) were also excluded to maintain sample consistency. Furthermore, children with hearing or visual impairments were not included, as such sensory limitations could interfere with participation in the movement-based intervention and the accurate assessment of outcomes.

Tools Used in the Study

Two standardized tools were used for data collection in the present study:

Indian Scale for Assessment of Autism (ISAA)

The Indian Scale for Assessment of Autism (ISAA) was used to confirm the diagnosis and determine the severity level of autism among the participants. ISAA is a standardized diagnostic tool developed and validated for the Indian population. The scale consists of multiple domains assessing social relationships, emotional responsiveness, speech and language, behavior patterns, sensory aspects, and cognitive components.

Based on ISAA norms, children scoring between 107 and 153 were classified as having moderate autism, and only those children meeting this criterion were included in the study. The ISAA also provides an estimation of the percentage of disability, which aided in the clinical profiling of participants. The scale has been widely used in clinical and research settings in India and demonstrates good reliability and validity for diagnosing autism spectrum disorder.

Repetitive Behavior Scale–Revised (RBS-R)

Repetitive and restricted behaviors were assessed using the Repetitive Behavior Scale–Revised (RBS-R) developed by Lam and Aman (2004). The RBS-R is a 43-item parent-report questionnaire designed to measure the range and severity of repetitive behaviors in children and adolescents with Autism Spectrum Disorder aged 6–17 years.

The scale consists of six distinct subscales that assess different behavioral dimensions. These include Stereotyped Behavior, measured through six items; Self-Injurious Behavior, assessed using eight items; Compulsive Behavior, comprising six items; Sameness Behavior, evaluated with eight items; Ritualistic Behavior, which includes eleven items; and Restricted Behavior, measured through four items.

Each item is rated on a four-point Likert scale ranging from 0 (behavior does not occur) to 3 (behavior occurs and is a severe problem). The RBS-R allows differential identification of discrete forms of repetitive behaviors without item overlap. The scale has demonstrated high internal consistency, with Cronbach's alpha coefficients ranging from 0.73 to 0.98, along with satisfactory test–retest reliability and construct validity.

Procedure

After obtaining permission from the institution and informed consent from parents, baseline assessment was conducted using the RBS-R through structured parent interviews conducted in a quiet and comfortable environment. The child was not present during the interview to ensure unbiased reporting. Pre-test scores were recorded prior to the intervention.

Dance Movement Therapy Intervention

The Dance Movement Therapy (DMT) intervention package implemented in the present study was adapted from Joanne Lara's *"Wake Up the Brain"* autism movement therapy model. While the original framework emphasizes neurological activation through movement, it was systematically modified to suit the cognitive, motor, and behavioral capacities of children with moderate autism. The adaptations focused on enhancing structure, repetition, predictability, and engagement, thereby ensuring developmental appropriateness and therapeutic effectiveness for the target population.

Intervention Schedule and Setting

The intervention consisted of 30 structured sessions, each lasting 45 minutes, conducted three times per week over the intervention period. Sessions were delivered in a small-group format to facilitate peer interaction while maintaining individualized attention. All sessions were

facilitated by the researcher in a controlled and supportive environment.

Materials used during the intervention included a music box, song CDs, a stopwatch to regulate activity duration, and video-modeling aids to support visual learning and imitation.

Therapeutic Techniques Employed

The Dance Movement Therapy (DMT) intervention package integrated a range of evidence-based behavioral and movement-oriented techniques to maximize learning, engagement, and skill generalization among children with autism. These techniques were systematically applied throughout the sessions to address individual learning needs while maintaining a supportive and motivating therapeutic environment. The core therapeutic strategies included instruction, modeling, role play, video modeling, feedback, and reinforcement, all of which were carefully adapted to be developmentally appropriate and child-centered.

Instruction formed the foundation of each therapeutic activity. Clear and concise verbal explanations were provided to describe the target movements or behaviors expected from the participants. Instructions were deliberately kept brief, concrete, and simple to accommodate language and comprehension difficulties commonly observed in children with autism. To enhance understanding and reduce ambiguity, verbal instructions were consistently paired with visual and physical demonstrations, enabling children to process information through multiple sensory channels.

Modeling functioned as a primary teaching and learning strategy within the DMT framework. The therapist demonstrated the desired movements, postures, or behavioral responses in a slow, exaggerated, and structured manner to ensure visibility and clarity. Immediately following the demonstration, children were encouraged to imitate and practice the movements, allowing learning to occur through observation and repetition. This approach capitalized on visual learning strengths and supported the development of imitation, motor planning, and social learning skills.

To further reinforce learning and sustain interest, **role play and video modeling** were incorporated into the sessions. Role play allowed children to actively enact movement sequences and social scenarios in a safe and structured setting, fostering creativity, emotional expression, and social understanding. Video modeling, in particular, proved beneficial for children who responded better to visual cues, as it provided repeated and consistent demonstrations of movements and behaviors that could be observed and internalized at the child's own pace.

Feedback was provided continuously and sensitively throughout the therapy sessions. Positive feedback in the form of verbal praise, smiles, gestures, or affirming movements was offered immediately following correct or improved performance, reinforcing confidence and motivation. When errors or difficulties were observed, gentle corrective feedback and guided assistance were provided to help children adjust and refine their movements without causing frustration or discouragement. This ongoing feedback process supported skill acquisition and self-regulation.

Reinforcement strategies were systematically employed to strengthen and maintain desired behaviors. Positive reinforcement was used to encourage behaviors such as following instructions, sustaining attention, maintaining eye contact, engaging in turn-taking, and demonstrating coordinated and purposeful movements. Reinforcers included verbal appreciation, social approval, and motivating gestures, all tailored to the individual child's preferences. Consistent reinforcement increased the likelihood of repetition and generalization of learned behaviors beyond the therapy setting.

Overall, the integrated use of these therapeutic techniques ensured that the DMT intervention was structured, engaging, and responsive to the unique learning profiles of children with autism, thereby promoting meaningful behavioral, motor, and social outcomes.

Structure of the Therapy Sessions

Each Dance Movement Therapy (DMT) session was delivered through a carefully planned, highly structured, and predictable framework to meet the therapeutic needs of children with autism. Consistency in session structure plays a crucial role in reducing uncertainty and anxiety, enhancing emotional security, and facilitating better engagement and participation. The structured progression of activities also supports smoother transitions, improves attention span, and allows children to anticipate upcoming tasks, thereby fostering a sense of control and comfort within the therapeutic environment. The sessions were designed to move gradually from simple, grounding activities to more expressive and interactive movements, and finally toward a calm and socially meaningful closure.

The session began with a **welcome phase**, where the therapist and children exchanged mutual greetings through verbal cues, gestures, or simple movements. This phase aimed to encourage social initiation, eye contact, and group cohesion while setting a positive emotional tone for the session. Establishing this initial connection helped children attune to the therapist and peers, promoting readiness for group participation.

Following this, **warm-up activities** were introduced, consisting of simple, repetitive movements such as jumping, clapping, stamping, and turning. These activities helped activate the body, regulate arousal levels, and increase muscle awareness, preparing the children physically and mentally for more structured movement tasks. Repetition in warm-up exercises also supported motor learning and reduced resistance to participation.

Hand-crossing or cross-hemispheric exercises were then incorporated to stimulate bilateral integration and coordination between the left and right hemispheres of the brain. These movements supported improved motor planning, balance, and sensory integration, which are often areas of difficulty for children with autism. By engaging both sides of the body simultaneously, these activities also enhanced focus and neurological organization.

Next, **clapping games** involving rhythmic and patterned sequences were conducted to strengthen attention,
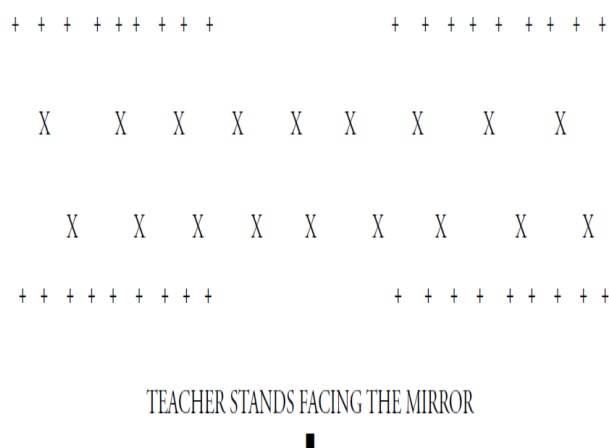
auditory–motor synchronization, imitation, and timing skills. These activities encouraged children to follow cues, anticipate movements, and respond appropriately, thereby enhancing impulse control and cooperative participation.

Circle time followed, during which children participated in floor-based group exercises without the use of music. The absence of music minimized sensory overload and helped children focus on bodily sensations, posture, and controlled movements. This segment promoted grounding, body awareness, and sustained attention within a shared group space, reinforcing social boundaries and turn-taking.

In the **four movements and four sounds activity**, each child was encouraged to take a leadership role by demonstrating two movements accompanied by corresponding vocal sounds. The rest of the group imitated these movements and sounds, fostering self-confidence, leadership skills, social imitation, and peer acknowledgment. This activity also supported expressive communication and enhanced the child's sense of agency within the group.

The **naming game** further promoted self-expression and identity awareness by breaking each child's name into syllables and pairing them with specific movements. This activity strengthened verbal–motor integration, rhythm, and self-recognition, while also reinforcing memory and sequencing skills. It provided an opportunity for children to express individuality in a structured and supportive environment.

Animal-based cross-clapping activities were then introduced, combining midline-crossing movements with naming or imitating animals. These activities integrated cognitive processing with motor coordination, enhanced symbolic thinking, and encouraged imaginative engagement. Similarly, **alphabet hemispheric clapping exercises** paired alphabet sounds with cross-lateral movements, supporting auditory processing, sequencing, coordination, and early academic readiness skills.

+ + + ++ ++ + +   + + ++ + ++ + +

X   X   X   X   X   X   X   X   X

X   X   X   X   X   X   X   X   X

+ + + + + ++ +   + + + + + ++ + +

TEACHER STANDS FACING THE MIRROR

▮

Imitative movement activities such as the **mouse activity**, where children enacted a mouse cleaning different body parts, were used to enhance body awareness, imitation, and self-care concepts. This was followed by the **elephant activity**, which involved large, slow, and rhythmic movements that promoted balance, strength, postural control, and gross motor coordination. These animal-

themed activities also increased motivation and enjoyment, making therapeutic goals more accessible.

Slide activities, performed in pairs and involving movement across the floor with directional changes, were incorporated to develop spatial awareness, coordination, and cooperative interaction. Working in pairs encouraged peer engagement, turn-taking, and social cooperation, which are essential social skills for children with autism.

Each session concluded with a **farewell phase**, providing a structured and emotionally meaningful closure to the therapeutic experience. Children expressed goodbye through words, gestures, or movements, reinforcing social reciprocity, emotional regulation, and a clear sense of completion. This closing ritual helped children transition smoothly from the therapeutic setting and reinforced the predictability and safety of the session structure.

Overall, the structured yet flexible design of the DMT sessions ensured a balanced integration of physical movement, emotional expression, cognitive engagement, and social interaction, thereby supporting the holistic development of children with autism.

DMT classroom floor layout (Small group)

T- Dance Movement Teacher trainee

X- Students standing the position

+ - Students moving across the floor pathway

Session Procedures and Group Rules

Each Dance Movement Therapy session was conducted in a structured and predictable manner to ensure emotional safety, consistency, and active participation among children with moderate autism. Participants entered the therapy space in an orderly line and proceeded to their designated positions on the floor. This entry routine was intentionally incorporated to promote transition readiness, reduce anxiety, and establish a sense of order before the commencement of movement activities.

Every session began with a brief group discussion facilitated by the researcher. During this phase, children were encouraged, according to their verbal abilities, to share their experiences from the previous session and express their expectations or feelings about the current session. This interaction served as an opportunity to enhance social initiation, communication, and emotional expression, while also reinforcing continuity between sessions. The researcher guided the discussion sensitively, ensuring that both verbal and non-verbal children were included through gestures, prompts, or modeled responses.

Throughout the session, the researcher played a central role in facilitating all activities, providing clear instructions, modeling movements, and maintaining the flow of the session. Transitions between activities were carefully planned and executed using verbal cues, rhythmic signals, or musical prompts to minimize confusion and maintain engagement. This structured sequencing of activities was particularly important in supporting children who exhibit rigidity or difficulty with transitions.

At the beginning of each session, group rules were clearly stated and demonstrated to promote consistency, cooperation, and positive group dynamics. These rules were reinforced verbally and through modeling whenever necessary. The core group rules were clearly established and consistently reinforced to ensure a safe, structured, and cooperative therapeutic environment. Participants were expected to follow both group-level and individual instructions provided by the therapist, promoting attention, compliance, and understanding of task expectations. Children were encouraged to accurately repeat movements as demonstrated, either independently or in synchrony with peers, thereby enhancing imitation and group participation.

Maintaining appropriate personal space during movement activities was emphasized to support physical boundaries and social awareness. Turn-taking was actively practiced during group and paired exercises to foster patience and cooperative interaction. Participants were also guided to sustain eye contact and remain socially aware of peers during interactive tasks, strengthening social engagement and responsiveness. Coordinating movements with others was encouraged to promote group synchrony, cooperation, and a sense of belonging. Additionally, children were supported in seeking assistance from the therapist or peers whenever required, reinforcing help-seeking behavior and positive social communication.

Emphasis was placed on helping children internalize these rules gradually through repetition, positive reinforcement, and consistent practice. Praise and encouragement were provided to reinforce rule-following behaviors and cooperative participation. When difficulties arose, gentle prompts and redirection were used to support self-regulation and re-engagement without causing distress.

Strict adherence to step-by-step session procedures was maintained across all intervention sessions to ensure uniformity in delivery and therapeutic consistency. This predictable and well-organized framework enabled children to anticipate session activities, thereby reducing anxiety and minimizing disruptive behaviors. The structured yet flexible nature of the sessions allowed repetitive and restricted behaviors to be redirected into purposeful, rhythmic, and socially meaningful movements.

Overall, the session procedures and group rules formed a foundational component of the intervention, facilitating behavioral regulation, enhancing peer interaction, and supporting the therapeutic goal of reducing repetitive and restricted behaviors through structured movement-based engagement.

4. ETHICAL CONSIDERATIONS

The study was conducted in strict accordance with established ethical guidelines for research involving human participants. Ethical approval was obtained from the institutional ethics committee prior to data collection. Informed written consent was secured from all primary caregivers after providing a clear explanation of the study's objectives, procedures, and the voluntary nature of participation.

Confidentiality and anonymity were maintained by assigning unique identification codes to participants, and all data were securely stored with access restricted to the research team. Efforts were made to minimize any physical or psychological discomfort during assessments, allowing children to take breaks or withdraw from tasks if distress was observed. Parents were informed of their right to withdraw from the study at any time without penalty.

Upon completion of the assessments, caregivers received feedback on their child's developmental profile, along with guidance and referrals for intervention services when needed. These measures ensured that the study upheld the principles of respect, beneficence, and integrity while prioritizing the well-being of both children and their caregivers.

5. STATISTICAL ANALYSIS

Data were analyzed using the Statistical Package for Social Sciences (SPSS), Version 20. Descriptive statistics, including mean and standard deviation, were calculated for pre-test and post-test scores. Paired *t*-tests were employed to determine the significance of differences between pre-intervention and post-intervention scores across the overall RRB domain and its subscales. Statistical significance was set at $p < .05$.

6. RESULTS AND DISCUSSION

The present study examined the effectiveness of Dance Movement Therapy (DMT) in reducing repetitive and restricted behaviors among children with moderate Autism Spectrum Disorder. Data were collected from a sample of 10 children diagnosed with moderate autism attending the Child Development Centre at KIDZ LIFE Autism Center, Chandanagar. The Repetitive Behavior Scale–Revised (RBS-R) was administered to parents before and after the intervention to assess changes in repetitive and restricted behaviors.

The intervention was delivered three times per week over a period of four months, comprising a total of 48 sessions. Data were analyzed using the Statistical Package for Social Sciences (SPSS), Version 20. Descriptive statistics (mean and standard deviation) and inferential statistics using the paired *t*-test were employed to compare pre-test and post-test scores. The results are presented below according to the stated hypotheses.

Pre-test	10	11.2	2.2	4.7	.001
Post-test	10	10.2	1.7		

Table 1. Description of the Sample

S.NO	Subject	Gender	Age	Level of Autism
1	Participant-1	Male	5 years 1 month	Moderate Autism
2	Participant-2	Female	5 years 6 months	Moderate Autism
3	Participant-3	Male	6 years 10 months	Moderate Autism
4	Participant-4	Male	6 years 11 months	Moderate Autism
5	Participant-5	Female	7 years	Moderate Autism
6	Participant-6	Male	7 years 2 months	Moderate Autism
7	Participant-7	Male	7 years 7 months	Moderate Autism
8	Participant-8	Female	8 years 9 months	Moderate Autism
9	Participant-9	Male	8 years 10 months	Moderate Autism
10	Participant-10	Male	9 years 11 months	Moderate Autism

Table 2 presents the pre-test and post-test mean scores, standard deviations, and *t*-values for the stereotyped behavior subscale of the RBS-R. The results indicate a reduction in stereotyped behavior scores from a pre-test mean of 11.2 (SD = 2.2) to a post-test mean of 10.2 (SD = 1.7). The obtained *t*-value of 4.7 was statistically significant at the 0.01 level, indicating a significant improvement following the DMT intervention.

The individual participant data further revealed that the majority of children demonstrated a decrease in stereotyped behaviors, with gains ranging from 0 to 2 points. This consistent reduction suggests that the intervention was effective in addressing repetitive motor patterns commonly observed in children with moderate autism.

FIGURE 1: Mean scores of pre-test and post-test on Stereotype sub-scale.

Table-1 gives the sample for the present study consisted of ten children diagnosed with moderate autism. Among them, seven were male and three were female participants. The age of the participants ranged from 5 years 1 month to 9 years 11 months, representing early to middle childhood. Specifically, two children were in the 5-year age range, two were around 6 years, three were around 7 years, two were around 8 years, and one child was nearly 10 years old. All participants were classified under the moderate level of autism, ensuring homogeneity of the clinical severity within the sample.

This distribution indicates a predominance of male participants, which is consistent with the higher prevalence of autism reported among boys in existing literature. The relatively narrow age range and uniform severity level were deliberately selected to reduce developmental and clinical variability, thereby allowing a more focused examination of the intervention effects (or study variables) in children with moderate autism.

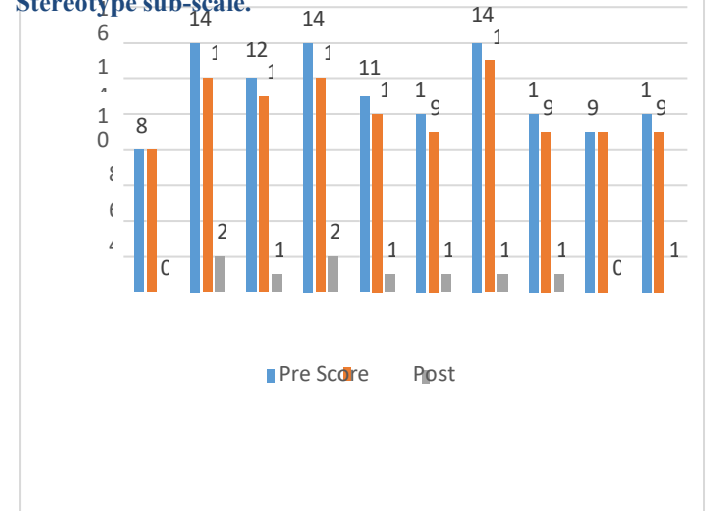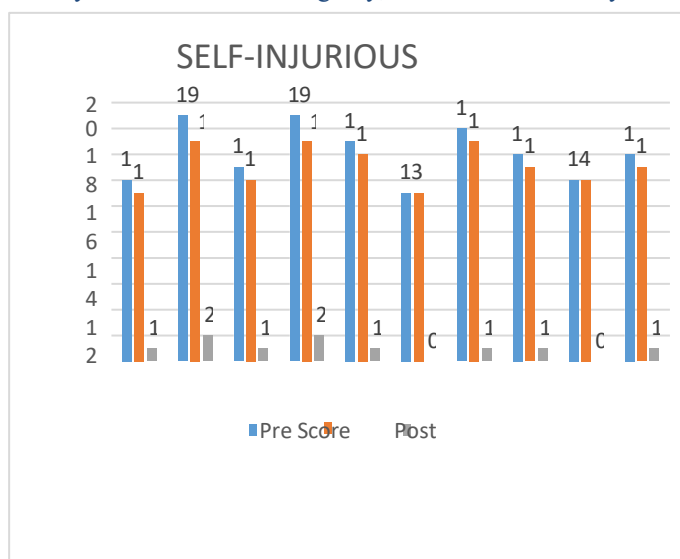Effect of DMT on Stereotyped Behaviors

Table 2. Pre- and post-test mean scores on stereotyped behavior subscale

Test	N	Mean	SD	*t*	*p*

The significant reduction in stereotyped behaviors observed in the present study supports the effectiveness of Dance Movement Therapy as a movement-based intervention for children with moderate autism. Stereotyped behaviors, such as repetitive motor movements and rigid action patterns, often serve as self-stimulatory responses and interfere with functional engagement and social interaction. The structured and rhythmic nature of the DMT sessions may have provided an alternative channel for motor expression, thereby reducing reliance on repetitive behaviors.

The use of cross-hemispheric movements, rhythmic clapping, mirroring, and synchronized group activities likely contributed to enhanced motor coordination, body awareness, and self-regulation. Additionally, repeated exposure to structured movement sequences and predictable session formats may have helped reduce

anxiety and behavioral rigidity, which are closely

FIGURE 3: Mean scores of pre-test and post-test on the self-injurious behavior sub- scale domain.

associated with stereotyped behaviors.

These findings are consistent with earlier research suggesting that movement-based and body-oriented interventions can positively influence behavioral regulation in children with autism. The present results highlight that DMT not only supports emotional and social engagement but also plays a meaningful role in reducing core behavioral symptoms such as stereotypy.

Thus, the findings provide empirical support for the acceptance of Hypothesis 1, indicating that Dance Movement Therapy is an effective intervention for reducing stereotyped behaviors among children with moderate autism.

Effect of Dance Movement Therapy on Self-Injurious Behavior

Table 3. Pre- and post-test mean scores on self-injurious behavior subscale

Test	N	Mean	SD	t	p
Pre-test	10	16.1	2.1	5.0	.001
Post-test	10	14.8	2.0		

Table 3 presents the pre-test and post-test mean scores, standard deviations, and *t*-values for the self-injurious behavior subscale of the Repetitive Behavior Scale–Revised (RBS-R). The results indicate a noticeable reduction in self-injurious behavior scores following the intervention. The pre-test mean score was 16.1 (SD = 2.1), which decreased to a post-test mean of 14.8 (SD = 2.0). The obtained *t*-value of 5.0 was statistically significant at the 0.01 level, demonstrating a highly significant improvement after participation in the Dance Movement Therapy program.

An examination of individual participant data revealed that most children showed measurable improvement, with score reductions ranging from 0 to 2 points. Although a few participants exhibited minimal or no change, the overall trend clearly reflected a reduction in self-injurious behaviors across the sample.

Self-injurious behaviors represent one of the most challenging behavioral manifestations in children with autism, often linked to sensory dysregulation, emotional distress, and difficulties in communication. The significant decrease observed in the present study suggests that Dance Movement Therapy can serve as an effective non-pharmacological intervention for managing such behaviors.

The structured movement activities, rhythmic patterns, and guided motor engagement provided during the DMT sessions may have facilitated improved sensory integration and emotional regulation. Through repetitive yet purposeful movements, children were offered alternative means of expressing tension and frustration, thereby reducing the need for self-injurious responses. Additionally, the incorporation of therapist modeling, feedback, and positive reinforcement likely strengthened adaptive behaviors while discouraging maladaptive ones.

These findings are consistent with earlier research highlighting the role of movement-based and body-oriented therapies in enhancing self-regulation and reducing maladaptive behaviors in children with autism. The results of the present study therefore support the acceptance of Hypothesis 2, confirming that Dance Movement Therapy significantly reduces self-injurious behaviors among children with moderate autism.

Effect of Dance Movement Therapy on Compulsive Behavior

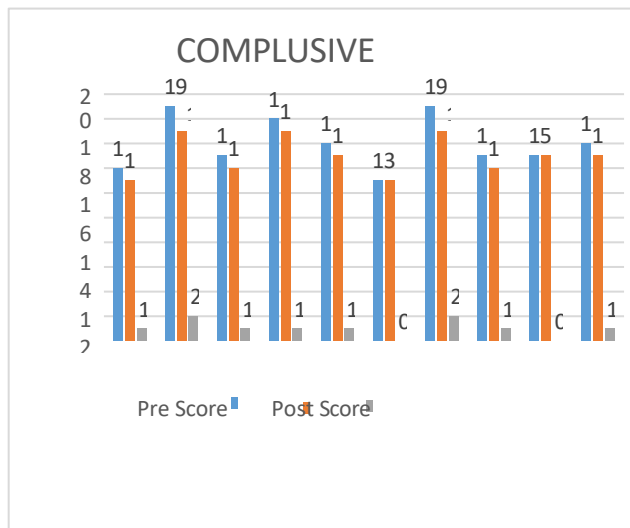**Table 4. Pre- and post-test scores on the compulsive behavior subscale**

Test	N	Mean	SD	t	p
Pre-test	10	16.0	2.1	3.2	.011
Post-test	10	15.2	1.5		

Table 4 presents the pre-test and post-test mean scores, standard deviations, and *t*-values for the compulsive behavior subscale of the Repetitive Behavior Scale–Revised (RBS-R). The results demonstrate a reduction in compulsive behavior following the Dance Movement Therapy intervention. The mean pre-test score of 16.0 (SD = 2.1) decreased to a post-test mean of 15.2 (SD = 1.5). The obtained *t*-value of 3.2 was statistically significant at the 0.01 level, indicating that the intervention had a meaningful effect on reducing compulsive behaviors among the participants.

Analysis of individual participant scores revealed that the majority of children showed improvement, with reductions ranging from 0 to 2 points. Notably, Participants 2 and 7 demonstrated the highest level of improvement, with a decrease of 2 points each from pre-test to post-test. A few participants showed minimal or no

change; however, the overall trend indicated a consistent decline in compulsive behavior scores across the sample.

FIGURE 3: RBS-R scores of pre-test and post-test on Compulsive Behaviour sub-scale.

Compulsive behaviors in children with autism often manifest as rigid adherence to routines, repetitive actions, and difficulty adapting to change. These behaviors can interfere with learning, social participation, and daily functioning. The observed reduction in compulsive behavior scores suggests that Dance Movement Therapy offers a structured yet flexible therapeutic environment that helps children gradually tolerate change and engage in more adaptive behavioral patterns.

The rhythmic and repetitive nature of the movement activities, combined with guided variation and therapist support, may have enabled children to redirect compulsive tendencies into organized, purposeful motor actions. Techniques such as modeling, role play, reinforcement, and synchronized group movement likely contributed to increased behavioral flexibility and improved self-control.

The findings support the acceptance of Hypothesis 3, confirming that the Dance Movement Therapy package was effective in significantly reducing compulsive behaviors among children with moderate autism.

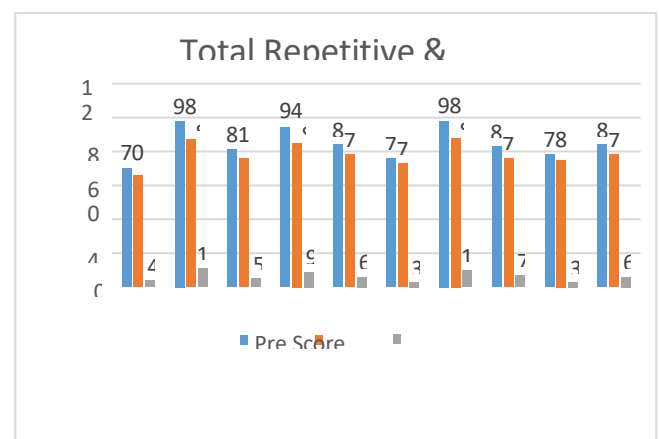Effect of Dance Movement Therapy on Repetitive Behaviors

Table 5. Pre- and post-test scores on repetitive behaviors subscale

Test	N	Mean	SD	*t*	*p*
Pre-test	10	84.2	9.6	6.8	.001
Post-test	10	77.6	6.7		

Table 5 presents the pre-test and post-test mean scores, standard deviations, and *t*-values for the repetitive behavior subscale of the Repetitive Behavior Scale–Revised (RBS-R). The results indicate a substantial reduction in repetitive behaviors following the Dance Movement Therapy intervention. The pre-test mean score was 84.2 (SD = 9.6), which decreased to a post-test mean of 77.6 (SD = 6.7). The obtained *t*-value of 6.8 was statistically significant at the 0.01 level, demonstrating that the intervention had a strong and meaningful effect on reducing repetitive behaviors in children with moderate autism.

Analysis of individual participant data revealed varying levels of improvement. The gains ranged from 3 to 11 points, with participants 2 and 7 showing the highest reductions of 11 and 10 points, respectively. Most children exhibited consistent decreases in repetitive behavior scores, indicating that the structured DMT sessions effectively addressed motoric and behavioral rigidity.

FIGURE 4 : Mean scores of pre-test and post-test on repetitive behaviour sub domain

Repetitive behaviors, which often manifest as motor stereotypies, ritualized actions, or adherence to routines, are a core feature of autism and can interfere with adaptive functioning, learning, and social interaction. The significant reduction observed in this study suggests that Dance Movement Therapy offers a structured, rhythmic, and socially engaging medium through which children can redirect repetitive tendencies into purposeful movement.

The use of coordinated group activities, cross-hemispheric exercises, rhythmic clapping, and mirroring likely facilitated improvements in motor coordination, attention, and behavioral regulation. By integrating repetitive movements into structured and socially meaningful tasks, children were able to engage in motor expression while gradually reducing maladaptive, non-functional repetitive behaviors.

These findings are consistent with prior research demonstrating that movement-based interventions can effectively reduce repetitive behaviors in children with autism, providing both sensory regulation and behavioral flexibility. Thus, the results support the acceptance of

Hypothesis 4, confirming that Dance Movement Therapy significantly decreases repetitive behaviors among children with moderate autism.

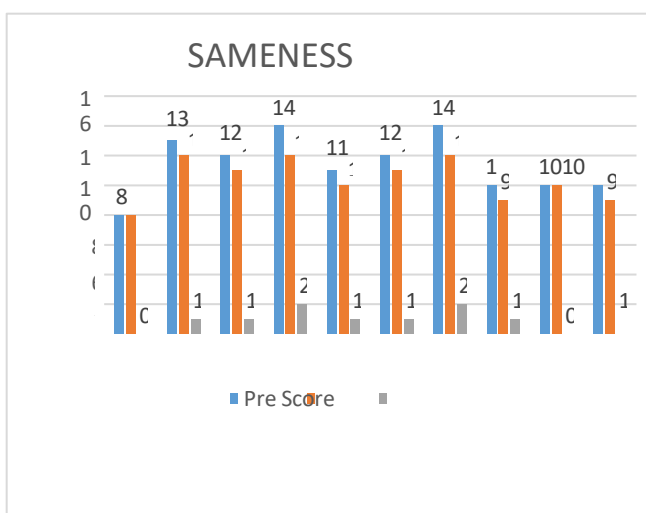Effect of Dance Movement Therapy on Sameness Behavior

Table 6. Pre- and post-test scores on sameness behavior subscale

Test	N	Mean	SD	t	p
Pre-test	10	11.4	2.0	4.7	.001
Post-test	10	10.4	1.4		

Table 6 presents the pre-test and post-test mean scores, standard deviations, and *t*-values for the sameness behavior subscale of the Repetitive Behavior Scale–Revised (RBS-R). The data indicate a significant reduction in sameness behavior scores following the Dance Movement Therapy intervention. The pre-test mean was 11.4 (SD = 2.0), which decreased to a post-test mean of 10.4 (SD = 1.4). The calculated *t*-value of 4.7 was statistically significant at the 0.01 level, confirming that the intervention had a meaningful effect on reducing sameness behaviors.

Individual participant analysis revealed gains ranging from 0 to 2 points, with most children exhibiting a consistent decrease in scores. Participants 4 and 7 demonstrated the highest improvement, each showing a reduction of 2 points, whereas a few participants showed minimal or no change. The overall trend clearly reflects a positive impact of the structured DMT program on enhancing behavioral flexibility.

FIGURE 6: Mean scores of pre-test and post-test on total sameness sub-domain.

Sameness behavior, characterized by resistance to change, insistence on routines, and rigidity in actions, is a prominent feature of moderate autism. Such behaviors can limit adaptive functioning and social engagement. The significant reduction in sameness behavior observed in this study suggests that Dance Movement Therapy provides children with structured opportunities to practice flexibility and adapt to variations in movement, rhythm, and group activities.

The intervention incorporated repetitive yet varied movement sequences, turn-taking exercises, cross-hemispheric activities, and group-based coordination, all of which likely contributed to improving tolerance for change and reducing rigidity. Positive reinforcement, feedback, and modeling by the therapist may have further encouraged adaptive behavioral responses while reducing insistence on sameness.

These findings support the acceptance of Hypothesis 5, demonstrating that Dance Movement Therapy effectively decreases sameness behaviors in children with moderate autism, thereby enhancing their capacity for behavioral flexibility and social participation.

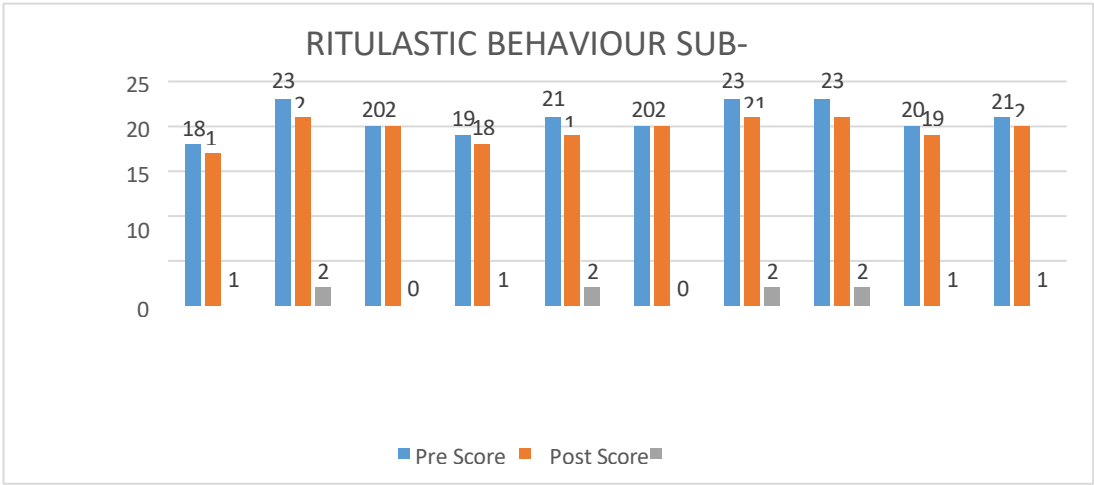Effect of Dance Movement Therapy on Ritualistic Behavior

Table 7. Pre- and post-test scores on ritualistic behavior subscale

Test	N	Mean	SD	t	p
Pre-test	10	20.8	1.8	3.3	.009
Post-test	10	19.3	1.6		

Table 7 presents the pre-test and post-test mean scores, standard deviations, and *t*-values for the ritualistic behavior subscale under the restricted domain of the Repetitive Behavior Scale–Revised (RBS-R). The pre-test mean score of 20.8 (SD = 1.8) decreased slightly to a post-test mean of 19.3 (SD = 1.6). While the trend indicates a small reduction in ritualistic behaviors, the *t*-value of 3.3 did not reach the conventional threshold for statistical significance at the 0.01 level. Therefore, the difference between pre- and post-test scores is considered not statistically significant, and the hypothesis is rejected.

Individual participant data revealed minor improvements in ritualistic behaviors, with gains ranging from 0 to 2 points. Participants 2, 5, 7, and 8 showed the largest reductions of 2 points each, while others demonstrated minimal or no change. Overall, the intervention had a limited impact on ritualistic behaviors compared to other subdomains such as stereotype, compulsive, and sameness behaviors.

FIGURE 7: Mean scores of pre-test and post-test on Ritualistic behaviour under restricted sub-domain

RITULASTIC BEHAVIOUR SUB-

Ritualistic behaviors in children with moderate autism, such as rigid routines, patterned activities, or repetitive sequences, are often deeply ingrained and resistant to change. The results suggest that while Dance Movement Therapy may provide structured opportunities for movement and social engagement, it may be less effective in significantly modifying entrenched ritualistic patterns within a four-month intervention period.

The lack of significant change could be attributed to the complexity and rigidity of ritualistic behaviors, which may require longer-duration interventions or more individualized strategies targeting specific routines. Additionally, ritualistic behaviors are often maintained by strong internal reinforcement, making them less responsive to general group-based movement interventions compared to more observable repetitive behaviors.

These findings highlight that while DMT is effective in reducing several aspects of repetitive and restricted behaviors, ritualistic behaviors may require supplementary interventions, such as individualized behavioral therapy or structured exposure-based approaches, to achieve meaningful change.

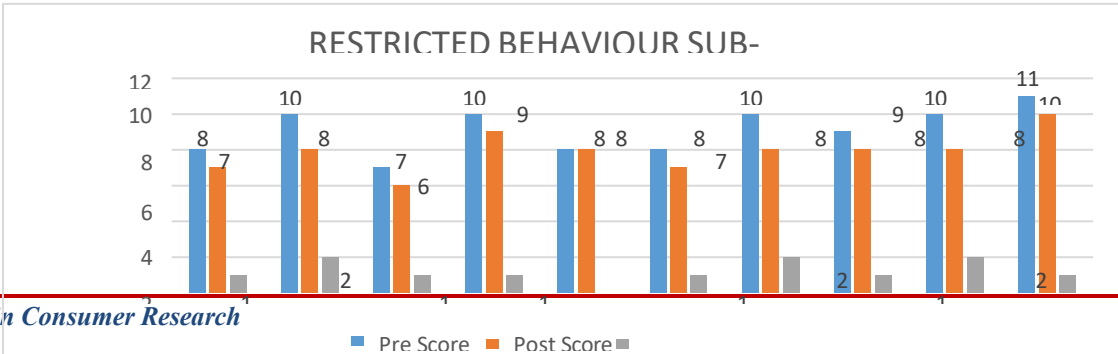Effect of Dance Movement Therapy on Restricted Behavior

Table 8. Pre- and post-test scores on restricted behavior subscale

Test	N	Mean	SD	*t*	*p*
Pre-test	10	8.7	1.2	4.7	.001
Post-test	10	7.7	0.8		

Table 8 presents the pre-test and post-test mean scores, standard deviations, and *t*-values for the restricted behavior subscale under the Repetitive Behavior Scale–Revised (RBS-R) domain. The pre-test mean score was 8.7 (SD = 1.2), which decreased to a post-test mean of 7.7 (SD = 0.8) following the Dance Movement Therapy intervention. The calculated *t*-value of 4.7 was statistically significant at $p < 0.01$, indicating a meaningful reduction in restricted behaviors among the participants.

Individual participant analysis revealed varying degrees of improvement. Participants 2 and 7 showed the greatest reduction, each with a gain of 2 points, while most other participants demonstrated gains of 1 point. A few participants exhibited no change, reflecting the variability in response to the intervention. Overall, the trend suggests that Dance Movement Therapy effectively reduces restricted behaviors in children with moderate autism

FIGURE 7: RBS-scale scores of pre-test and post-test on restricted behaviours.

RESTRICTED BEHAVIOUR SUB-

Restricted behaviors in autism, such as rigid interests, limited engagement in novel activities, and reduced adaptability, can interfere with learning and social participation. The significant reduction in restricted behavior scores indicates that Dance Movement Therapy provides structured, rhythmic, and socially interactive experiences that encourage flexibility, adaptation, and engagement in new patterns of movement.

The intervention's emphasis on turn-taking, cross-hemispheric coordination, group synchronization, and guided exploration of movement patterns likely contributed to reducing rigidity and fostering adaptive behavioral responses. While some participants showed minimal change, the overall reduction demonstrates the potential of DMT as an effective strategy for addressing restricted behaviors in moderate autism.

These findings support the acceptance of Hypothesis 7, demonstrating that Dance Movement Therapy positively impacts restricted behaviors and enhances behavioral flexibility in children with moderate autism.

Repetitive and Restricted behaviours

Repetitive behaviours

Table 9: Mean values, standard deviations, and *t*-values of repetitive behaviours scores in the experimental group

Test	N	Mean	Std. Deviation	t-value	Sig.
Pre-test	10	92.12	24.78	7.172	.001
Post-test	10	88.87	24.54		

The results of the paired-sample *t*-test indicate a significant reduction in repetitive behaviours scores among participants after the Dance Movement Therapy (DMT) intervention ($t = 7.172$, $p < 0.05$). This suggests that the structured, interactive, and rhythmic activities implemented in the therapy sessions positively enhanced social learning, peer interaction, and engagement in children with moderate autism.

Restricted behaviours

Table 10: Mean values, standard deviations, and *t*-values of restricted behaviours scores in the experimental group.

Test	N	Mean	Std. Deviation	t-value	Sig.
Pre-test	8	101.8	34.35	8.037	.001
Post-test	8	98.50	34.23		

Similarly, the paired-sample t-test results indicate a statistically significant reduction in restricted behaviors following the Dance Movement Therapy (DMT) intervention ($t = 8.037$, $p < 0.05$). The structured movement activities, combined with rhythmic cues and interactive exercises, appear to have enhanced both verbal and non-verbal communication abilities, with notable reductions in sameness, ritualistic behaviors, preoccupation with specific activities, and difficulties during transitions. The findings further suggest that Dance Movement Therapy can significantly improve both functional and daily living skills in children with moderate autism. The structured sessions encouraged repetition, rhythm, peer interaction, and coordinated movement, which likely contributed to improvements in social engagement, body awareness, posture, and flexibility of body movements. Given the limited research on DMT within the Indian context, especially for children with moderate autism, this study provides preliminary evidence supporting its effectiveness. Both group-level and individual-level analyses consistently demonstrated improvements, aligning with prior research that highlights the benefits of movement-based interventions for reducing repetitive & restricted behaviours in children with moderate autism (Karkou & Sanderson, 2006; Koch et al., 2015).

Conclusion

The present study demonstrates that Dance Movement Therapy (DMT) has significant potential in reducing repetitive and restricted behaviors (RRBs), including stereotyped, self-injurious, compulsive, sameness, ritualistic, and restricted patterns of behavior among children with moderate autism. Given that RRBs constitute a core and functionally impairing feature of autism, the development of intervention methods that directly target the underlying mechanisms of these behaviors is both necessary and timely, particularly for children with moderate levels of the condition.

In the Indian context, empirical evidence on the effectiveness of DMT remains scarce. Therefore, this study represents an important attempt to address this gap by systematically examining the therapeutic value of a newly developed DMT intervention package. The findings of the present investigation provide supportive evidence, consistent with previous international research, that structured and rhythm-based movement interventions can produce meaningful reductions in maladaptive behaviors in children with autism.

The newly adapted DMT intervention package proved effective in decreasing stereotyped, self-injurious, compulsive, ritualistic, sameness-related, and restricted behaviors in children with moderate autism. In addition to behavioral improvements, engagement with music and movement appeared to stimulate neural activity, enhance body awareness, and promote positive emotional regulation. These outcomes suggest that DMT may

facilitate beneficial changes in both functional behavior and underlying neuropsychological processes.

Furthermore, the results of this study may help promote more positive perceptions and attitudes toward children with autism among parents, teachers, and clinicians, while encouraging the adoption of a comprehensive and multi-contextual understanding of children's movement, play, and expressive potential. Participation in structured, enjoyable, and meaningful movement activities contributes not only to behavioral regulation but also to emotional wellbeing, stress reduction, and improved quality of life.

This study also highlights the importance of further exploring the relationship between neural connectivity and repetitive behaviors in autism. Future research should investigate how structural and functional brain connectivity influences RRBs and how movement-based interventions such as DMT may support neural integration and adaptive functioning.

Overall, the findings underscore the value of Dance Movement Therapy as a holistic, multi-dimensional, and child-centered intervention for children with autism. By integrating music, movement, emotion, and social interaction, DMT offers a powerful medium for enhancing daily functioning, promoting participation in pleasurable activities, and fostering a sense of wellbeing. The present study thus reinforces the role of DMT as a promising therapeutic approach for improving the quality of life of children with moderate autism and supporting their overall developmental progress.

Limitations of the Study

Small sample size and convenience sampling limit generalizability.

Limited number of intervention sessions may affect the long-term maintenance of acquired skills.

The study did not control for variables such as gender, socio-economic status, or baseline functional levels.

Suggestions for Future Research

Conduct similar studies with larger and more diverse samples to increase generalizability.

Implement longer and more frequent intervention sessions to evaluate sustained effects.

Explore DMT interventions with other clinical populations, such as ADHD, intellectual disability, or learning disabilities.

Utilize direct observational assessments in addition to self- or caregiver-reported measures to strengthen data validity.

Implications of the Study

The findings support the inclusion of Dance Movement Therapy by rehabilitation professionals as an effective intervention for reducing repetitive and restricted behaviors in children with moderate autism.

Structured, meaningful DMT activities can help children adapt effectively to social environments without fear or hierarchical pressures.

The study contributes to the growing literature on movement-based interventions and supports the development of tailored DMT programs for clinical populations.

REFERENCES

1. American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Washington, DC: Author.
2. Bodfish, J. W., Symons, F. J., Parker, D. E., & Lewis, M. H. (2000). Varieties of repetitive behavior in autism: Comparisons to mental retardation. Journal of Autism and Developmental Disorders, 30(3), 237–243. https://doi.org/10.1023/A:1005596502855
3. Fischman, D. (2009). Therapeutic relationships and kinesthetic empathy. In S. Chaiklin & H. Wengrower (Eds.), The art and science of dance/movement therapy (pp. 33–53). New York, NY: Routledge.
4. Fitzpatrick, M. (2018). Mirroring, social learning and dance movement therapy with children on the autism spectrum. Body, Movement and Dance in Psychotherapy, 13(1), 1–16. https://doi.org/10.1080/17432979.2017.1383363
5. Gabriels, R. L., Cuccaro, M. L., Hill, D. E., Ivers, B. J., & Goldson, E. (2005). Repetitive behaviors in autism: Relationships with associated clinical features. Research in Developmental Disabilities, 26(2), 169–181. https://doi.org/10.1016/j.ridd.2004.05.003
6. Jagruth, Lingala, Ram Kumar, B.V., Srivani, G., Debashis, R., & Sridevi, G. (2021). Executive Functions in Children with Autism: An Overview. Elixir Nursing Sciences; 150, 55183-55190.
7. Karkou, V., & Sanderson, P. (2006). Arts therapies: A research-based map of the field. Elsevier.
8. Koch, S. C., Kunz, T., Lykou, S., & Cruz, R. (2015). Effects of dance movement therapy and dance on health-related psychological outcomes: A meta-analysis. The Arts in Psychotherapy, 42(1), 46–64.
9. Koch, S. C., Morlinghaus, K., & Fuchs, T. (2007). The joy of movement: Therapeutic aspects of expressive dance in psychotherapy. Body, Movement and Dance in Psychotherapy, 2(2), 73–91.
10. Koegel, R. L., Vernon, T. W., Koegel, L. K., Koegel, B. L., & Paullin, A. W. (2011). Improving social engagement and initiations between children with autism spectrum disorder and their peers in inclusive settings. Journal of Positive Behavior Interventions, 14(4), 220–227. https://doi.org/10.1177/1098300712437042
11. Lam, K. S. L., & Aman, M. G. (2004). The Repetitive Behavior Scale–Revised: Independent validation in individuals with autism spectrum disorders. Journal of Autism and Developmental Disorders, 34(6), 639–649. https://doi.org/10.1007/s10803-004-5283-z
12. Leekam, S. R., Prior, M. R., & Uljarević, M. (2011). Restricted and repetitive behaviors in autism

spectrum disorders: A review of research in the last decade. Psychological Bulletin, 137(4), 562–593. https://doi.org/10.1037/a0023341

13. Manders, E., & Goodill, S. W. (2018). Mirroring dance movement therapy and interaction quality in individuals with autism spectrum disorder. Body, Movement and Dance in Psychotherapy, 13(1), 36–52. https://doi.org/10.1080/17432979.2017.1371879

14. Payne, H. (2006). Dance movement therapy: Theory, research and practice (2nd ed.). London, UK: Routledge.

15. Sen Gupta, M., & Banerjee, M. (2020). Effect of dance movement therapy on body attitude and communication in children with autism. Indian Journal of Mental Health, 7(3), 234–241.

16. Srinivas R.B., George. A.G, Mallikarjuna Rao Dubisetty, Dashrath Choudhari, Manish Kodicherla, Jagruth Lingala, Emotional Intelligence Among Adolescents: A Psychological Insight Into Developmental Dynamics And Predictive Factors, Journal of Neonatal Surgery; 14(31S), 1058-6.

17. Turner, M. (1999). Annotation: Repetitive behavior in autism: A review of psychological research. Journal of Child Psychology and Psychiatry, 40(6), 839–849. https://doi.org/10.1111/1469-7610.00502

18. Vidhupriya K.K, Vikram Baid, Rajni Rathi, Mallikarjuna R.D., George   A.G., & Jagruth Lingala. (2025). 1031Tracing the Impact of Digital Environments on Virtual Autism: Etiological Factors and Behavioral Profiles. Journal of Carcinogenesis; Vol 24(8), 1031-1045. https://carcinogenesis.com/pg.
.