

## Dance Movement Therapy: An experimental approach for the persons with Autism

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### ABSTRACT

Dance as a creative therapy, is performing expressive art was considered as a part of healing procedure for thousands of years. Based on the assumption that body and mind are interrelated, Dance Movement Therapy (DMT) is a kind of psycho-therapeutic process where movements are used for emotional, cognitive and physical integration of the individual. Autism Spectrum Disorder (ASD) is kind of neurodevelopmental disorder in which client suffers more or less with emotional, social, communication issues, with stereotyped movements, cognitive issues, unique strength or differences which might make them vulnerable in school or home set up; where DMT is one of the new modalities of mind-body medicine that are receiving widespread attention as alternative therapy in the medical field. The research question is to find out whether DMT can enhance Span of Attention, Emotional Recognition and Socialization of persons with Autism or not. 35 participants, suffering from Autism, age range from 11 to 17, were selected with using diagnostic tool named Autism Diagnostic Checklist. Stimulus card of span of attention, software of emotional recognition and Socialization Domain of Vineland Adaptive Behavior Scales (II) were used respectively to assess span of attention, emotional recognition and socialization of the participants having autism. Pre measure of above said three dependent variables on baseline session were taken first then DMT was introduced to selected people with 20 sessions. Sessions were designed with warm up, incubation, illumination and evaluation phase using principals of DMT. Laban movement analysis with prop utilization method were mainly used for enhancing span of attention, Natarasa with mirroring technique were used for emotional recognition. Limon based exercise, Feldenkrais Method and Contact improvisations were used as supporting method of DMT. Immediate measure just after completion of intervention and post measure after one month and three months, DMT was not practiced within this period, were taken to see the effect of DMT and longevity of this therapy respectively. Statistical analysis has revealed significant positive effect of DMT on span of attention, emotional recognition and socialization of people with autism which may help them to carry out any task that demands attention and make them understand others' emotional intention in comparison to that of

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before taking DMT session and some social skills that helps to make their wellbeing enhanced in future.

**Keywords:** *Dance Movement Therapy, Autism Spectrum Disorder, Span of Attention, Emotional Recognition, Socialization, Laban Movement Analysis, Nabarasa, Mirroring, Contact Improvisation*

**E**xpressive or creative therapy has benefits that includes improving self-awareness, developing conceptual skills (Turry, 2001), self-care, and stress reduction, improve therapeutic relationship (Scheiby, 2001), empathetic attunement (Cooper, 2001) etc. Dance, considered as a part of healing procedure for thousands of years and based on the assumption that body and mind are interrelated, Dance Movement Therapy (DMT) is defined by Chodorow in 1991 as the psycho therapeutic process of movement that helps individuals for their emotional and physical integration. DMT improves mobility, spatial integration, motor learning, balance, executive functioning in various populations (Stevens & McKechnie, 2005). For example, it can be said that DMT has been successfully applied to different populations like hospitalized psychiatric patients (Devis, 1981), elderly persons (Berrol, 1997), patients with schizophrenia, (Ellis, 2001), patients with sexual trauma (Truppi, 2001), anxiety & depression, (Reinemann, 1999), traumatic brain injury (Berrol & Katz, 1985), learning disability, (Couper, 1981), visual impairment (Krebs, 1979), persons with intellectual disability (Barteneiff & Lewis, 1980) etc.

Disability has been defined by World Health Organization (2018) as an umbrella term that covering impairments, activity limitations and participation restrictions. Neuro developmental disorders are a group of conditions which causes disability, with onset in the developmental period characterized by developmental deficits that produce impairments of cognitive, emotional, social, motor or occupational functioning. Autism Spectrum Disorder (ASD) is such kind of neurodevelopmental disorders that manifests variety of symptoms in such areas whereas DMT is one of the new modalities of mind-body medicine that are receiving extensive attention as a alternative therapy in medical field. In India limited studies having good sample size have been found on DMT in clinical populations, especially in case of neurodevelopmental disorder so, the need of a wholistic study on Autism Spectrum Disorder with experimental approach has been felt and was attempted.

## **METHODOLOGY**

### ***Objective***

To find out whether DMT can enhance Span of Attention, Emotional Recognition, Socialization of people having ASD.

### ***Hypothesis***

$H_0$ : There is no significant effect of DMT on a) Span of Attention, b) Emotional Recognition, c) Socialization of the persons with Autism Spectrum Disorder.

### ***Sample***

The sample consists of 35 participants, suffering from Autism Spectrum Disorder, by using purposive sampling technique. They were selected following DSM-IV criteria and Autism Diagnostic Checklist (ADCL). Age of the participants were considered within 11 to 17, both sex and mild to moderate Autism were incorporated as inclusion criteria, where as those having sensory or physical disability likely to interfere with DMT and severe Autism were excluded.

***Operational Definition***

1. **Baseline Session (BS)** – Signifying as pre intervention session.
2. **Immediate Session (IS)** – Post session just after completion of DMT.
3. **Post Session after One Month (P1)** - Post session 1 month later from the last date of intervention. DMT were not given during this period.
4. **Post Session after Three Months (P3)** - Post session 3 months later from the last date of intervention. DMT were not given during this period.

***Description of Assessment tools***

1. **Autism Diagnostic Checklist (ADCL):** This scale, developed by Banerjee (2007) is used to identify and classify Autism Spectrum Disorder in children above 3 years of age. This test can serve to diagnose, classify and identify the strength and weakness of people with autism on the basis of six factors (General Observation, Cognition, Emotion, Social, Communication and Sensory Dysfunction) rated on 5-point scale with full score (300) of 60 items, in Indian culture. The value of reliability by Cronbach's alpha 0.66 is significant. Both the criteria test validity and clinical validity of the test were established at 0.001.
2. **Vineland Adaptive Behavior Scales, Second Edition (Vineland-II)-** This scale is the revision of the Vineland Adaptive Behavior Scales (Vineland ABS, Sparrow et al. 1984) that has been a leading measurement tool of personal and social skills needed for everyday living and now includes Survey Interview, Parent or Caregiver Rating, Teacher Rating, Expanded Interview. These scales are organized within a three-domain structure: Communication, Daily Living, and Socialization and in addition, this scale also offers a Motor Skills Domain and an optional Maladaptive Behavior Index to provide more in-depth information about your clients (Sparrow et al, 2005). This scale can be administered as a single domain or any combination of domains to assess an individual's adaptive functioning in one or more areas or administer all domains to obtain the Adaptive Behavior score. Socialization domain has been used here for this study.
3. **Stimulus Card of Span of Attention:** Span of Attention is assessed by 15 inches by 10 inches stimulus card. It consists 6 color squares of 5 inches by 5 inches (Red, Blue, Green, Yellow, Black and White), one response card of same size that has 6 white squares and 6 small separate pieces of color squares, which are equal size and color of colored squares of stimulus card, are used to get response. At first the stimulus card is shown to the participants for 5 seconds then the response card along with 6 separate pieces of color squares were placed before them. After withdrawing stimulus card, participants are asked to arrange the separate color squares on the response card in same position as the stimulus card. To fix the number of color and the exposure time for stimulus card a pilot study was carried out with 65 persons with ASD and ID. Three trials were taken for each individual. Scoring; The correct position of color placing in response card gets one score each and, in this manner, the maximum total score is 6 for each trial. Then mean of three trials are computed for each participant.
4. **Software of Emotional Recognition:** A study was conducted by Ghosh, et al. 2018, to develop standardized videos of emotional expressions. They are happy, sad, anger and fear. Initially four expressions of two professional actors (one male and one female) were recorded and a pilot study was conducted on 21 participants, (age range 18- 27 years) both male and female University students, to assess appropriateness of expressed emotions. In the next step expressions of six professional actors (3 male and 3 female) were obtained based on the performance evaluated through Automatic

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Facial Expression Recognition Software (Chanda et al, 2014) and finally, four videos from 2 male actors and four from 2 female actors for each of the four basic expressions were selected. These final sets of videos were rated by 1022 people from different parts of Kolkata and participants were instructed to identify and name the expressed emotion. They were also instructed to rate the intensity of expressed emotion in a five-point scale. The mean of the intensity of expression was compared with the computer-generated judgment score and videos for final set were selected on the basis of two criteria ei- a) difference between human generated and computer-generated score below 1.5. b) Percentage of recognition above 90%.

### **Description of Techniques for Intervention**

- 1. Limon Technique:** Mexican-born modern dancer and choreographer Jose Limon has given proper breathing technique for continuous smooth motion. The dance method he created focuses on the breathing control while body moves, the dynamic use of weight in each body part and the smooth progression of movement (Lawrence, 2016). This technique is used here to teach participants breathing technique with movement.
- 2. Feldenkrais Method:** The Feldenkrais Method is a type of exercise therapy devised by Dr Moshe Feldenkrais (1904 – 1984). The method is claimed making connections between the brain and body that improves body movement and psychological state (Stalker & Glymour, 1989) by exercising small and slow movements of different body parts that helps to make the motor connections stronger gradually. The Feldenkrais Method is a kind of alternative exercise therapy that is used in this research to enhance movement repertoire, awareness, motor flexibility of the participants that helps to repair impaired connections between the motor cortex and the body, as well as it can enhance the quality of body movement and wellbeing (Stalker, 1989). This technique is used in this study along with Limon's breathing technique for preparing participant's body to receive DMT.
- 3. Contact Improvisation in DMT:** Contact improvisation of Steve Paxton involves the exploration from one's body to the next by sharing body weight, touch, helps to being kinetically aware and finding a point of contact between therapist and client (Steve, 1975). According to him the basic focus in this technique remains in physical touch, mutual support and innovative meditation of physical laws relating to mass, gravity, momentum, inertia, and friction for movement initiation. This technique is used here to help the participants performing tasks and to understand the warmth of others kinesthetically.
- 4. Laban Movement Analysis:** Sir Rudolf Von Laban introduced language in movement and gave four concepts in DMT. They are – Body (B), Space (S), Shape (S) and Effort (E). Laban Movement Analysis (LMA) is a method and language for describing, interpreting and documenting human movement and it has been drawn from multiple fields including anatomy, kinesiology and psychology. It is successfully used by dancers, actors, musicians, athletes, health professionals such as physical and occupational therapists and psychotherapists (Bartenieff, 1980) and so on. Laban gave 4 principles in his movement study to analyze “**Effort**”, on which “**Time**” principle has been used here with improvisation to enhance span of attention of the participants. The principles are given below:
  - **Time/Speed: Quick/ Sustained– When the movement occurs**
  - Intensity/Weight: Strong/Soft - What kind of movement occurs
  - Direction/Space: Wide/ narrow- Where the movement occurs

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- Flow: free /bound – How the movement occurs

Eight movements (glide, float, press, wring, dab, flick, punch, slash) of Laban technique with the help of different kind of props (balloon, ribbon, clay, hanky, brush, scarf, ball, stick) were introduced for each movement to make the task more interesting and challenging to reduce monotony along with to make the participants understand the difference between quick and sustained movements. Two movements with and without props per week was aimed to attain by participants and they were asked to do the task using their own authentic movement first then were asked to do with rhythm (slow to fast then fast to slow) to understand the concept of time kinesthetically.

5. **Nabarasha in DMT:** Rasa is about human state of mind. In the Bharat Muni's Natyashastra, Rasa is an emotion experienced by the audience created by the facial expression or the "Bhava" of the actor. Here only four "rasha", which is needed to express at regular basis for emotional communication, were used, out of nine, in Indian classical dance which is referred to as Rasa-abhinaya. They are: 1) Hasya (smile), 2) Kārunya (cry), 3) Raudra (angry), 4) Bhayānaka (fear).
6. **Mirroring in DMT:** Mirroring involves imitation by the therapist of movements, emotions, or intentions implied by a client's movement. According to Rizzolatti, (2004) mirroring in DMT improves understanding of others' emotional intentions through continuous stimulation of mirror neuron circuit and emotion recognition involves a neural simulation watching of another person's emotional actions in order to predict the intentions behind those actions, and empathize with them. Here this technique was used for aiming enhance recognition of emotions.

### **Procedure**

Inform consent has been taken from the institution and parents of the participants first. A training module incorporating principals of DMT were prepared and baseline measurements of three Dependent Variables were collected.

20 DMT sessions, lasted for 60 minutes each, consisting warm up, incubation, illumination and evaluation phase, five days in a week, were given. 5 minutes rest was given between sessions. Part of the training was individual and part of it was in group.

Limon Breathing Technique, Feldenkrais Method were used as introductory session focusing on establishing rapport and make the participant's body receptive to DMT followed by warm up exercises with soothing music. Method of Contact improvisation helped the participants to perform the tasks throughout the sessions. Incubation phase was designed for enhancing span of attention using Laban Movement Technique with the help of different kind of props. Technique of Nabarasa and mirroring were used for illumination stage for giving training on emotional expressions.

Three DV measurement tools were re-administered just after immediate completion of intervention and to prove longevity of the effect of DMT, follow up assessments, after 1 month and 3 months have been done.

## **RESULT**

**Table 1: Result of Levene's Test of Equality of Error Variance**

<b>Dependent Variable</b>	<b>F</b>	<b>Sig at 0.01 Level</b>
Span of Attention	0.28	NS
Emotional Recognition	0.07	NS
Socialization	3.03	NS

Table 1 indicated that there was homogeneity in sample in baseline session, so parametric approach was applicable as statistical analysis.

**Table 2: Mean & Standard Deviation of Level of DMT Sessions for Span of Attention**

<b>Variables</b>	<b>N</b>	<b>X</b>	<b>SD</b>	<b>X</b>	<b>SD</b>	<b>X</b>	<b>SD</b>	<b>X</b>	<b>SD</b>
<b>Level of DMT Sessions</b>	140	<b>BS</b>		<b>IS</b>		<b>P1</b>		<b>P3</b>	

**Table 3: Effect of DMT on Span of Attention with Post Hoc**

<b>Variables</b>	<b>F</b>	<b>Sig</b>	<b>Post Hoc Test</b>					
<b>Level of DMT Sessions</b>	16.14	S	<b>BS~IS</b>	<b>BS~P1</b>	<b>BS~P3</b>	<b>IS~P1</b>	<b>IS~P3</b>	<b>P1~P3</b>

BS- Baseline Session: IS- Immediate Session, P1- Post Session after 1 month: P3- Post Session after 3 months.

Table 3 has revealed that there was significant effect of DMT on span of attention. Post hoc test, compared the improvement by DMT sessions, has shown the maximum gain was in immediate session (IS) then post session after 1 month (P1) without therapy but not in post session after 3 months (P3) without therapy.

**Table 4: Mean & Standard Deviation of Level of DMT Sessions for Emotional Recognition**

<b>Variables</b>	<b>N</b>	<b>X</b>	<b>SD</b>	<b>X</b>	<b>SD</b>	<b>X</b>	<b>SD</b>	<b>X</b>	<b>SD</b>
<b>Level of DMT Session</b>	260	<b>BS</b>		<b>IS</b>		<b>P1</b>		<b>P3</b>	

**Table 5: Effect of DMT, Type, Level of Disability on Emotional Recognition with Post Hoc**

<b>Variables</b>	<b>F</b>	<b>Sig</b>	<b>Post Hoc Test</b>					
<b>Level of DMT Sessions</b>	20.02	S	<b>BS~IS</b>	<b>BS~P1</b>	<b>BS~P3</b>	<b>IS~P1</b>	<b>IS~P3</b>	<b>P1~P3</b>

Table 5 has shown that there was significant effect of DMT on emotional recognition. Comparing Post Hoc result, it can be seen that maximum improvement was in immediate session and not only that such effect remained relatively permanent even after one month and three months without DMT.

**Table 6: Mean & Standard Deviation of Level of DMT Sessions for Socialization**

<b>Variables</b>	<b>N</b>	<b>X</b>	<b>SD</b>	<b>X</b>	<b>SD</b>	<b>X</b>	<b>SD</b>	<b>X</b>	<b>SD</b>
<b>Level of DMT Sessions</b>	260	<b>BS</b>		<b>IS</b>		<b>P1</b>		<b>P3</b>	

**Table 7: Effect of DMT on Socialization with Post Hoc**

Variables	F	Sig	Post Hoc Test				
			BS~IS	BS~P1	BS~P3	IS~P1	IS~P3
Level of DMT Sessions	6.32	S	S	S	NS	NS	NS

Table 7 has discovered that there was significant effect of DMT on Socialization. Post hoc analysis just has been revealing of improvement by DMT had concealed in immediate session only.

## DISCUSSION

Autism Spectrum Disorder is kind of impairments of the growth and development of the brain or central nervous system (Reynolds, 1999). Neurobiological studies on dance has revealed that music stimulates the brain's reward centers and dance activates its sensory and motor circuits (Brown, et al 2008). Practicing movement in scientific way (using "Time Principle" of Effort Analysis of Laban technique involving different kinds of props), made the participants more focused on given interesting task (that was designed for improving attention) that helped to make them understand the span of time kinesthetically which enhances their span of attention. During performing tasks, participants had to pay continuous attention on their body balance, eye hand coordination, posture maintenance along with props that was able to make them paying more attention than before. And participants were enjoying those activities so much and could relate them with their regular activities using props that their paying attention was effortless which helped them to improve their span of attention in general. As it is known that dance is one of best way of exercise, it helps increasing temporal and prefrontal activity which improves memory, multi-tasking, planning and attention skills (Parekh, 2018). Dance itself has inherent expressive qualities. According to Levy, (2005), humans can use dance movement to express themselves in ways that is not possible to express by words. We exaggerate our emotions when we dance because dance demands exaggeration of emotional expression nonverbally. During DMT sessions, four "rasas" were practiced regularly by all the participants along with the therapist herself by using mirroring technique that helped the participants understand own emotions kinesthetically by using facial muscles along with others' emotional intention through enhanced use of mirror neuron circuit (Rizzolatti, 2001) which may remain dormant in motor cortex in case of Autism (Oberman, 2007). Dance therapy provides an exciting and enjoyable option for both therapist and clients that derived benefits from group activity using contact improvisation technique where participants did warm up exercises by joining hands and shifting body weight to each other which helped to enhance their social connections better than before which is supported by the findings that DMT fostered social interactions and expression of feelings as well as gaining self-control (Koshland, et al. 2004). Thus, improving communication, facilitation and socialization DMT has positive role. Further findings are also revealing that in case of remaining permanent effect, improvement curves of both Span of attention and socialization (BS - P3 = NS: table 3 and 7) are declined in post session after 3 months without giving DMT that is suggestive of practicing DMT for more sessions are needed for steady improvement.

## CONCLUSION

Present study concludes that the role of DMT, on cognitive, affective and social behavior in Autism Spectrum Disability is significantly huge but demands more sessions for Steady improvement in case of span of attention and socialization.

**Implication**

This study will help to understand the impact of DMT on some cognitive, affective and social aspects of human behavior which are also common for neurotypical individual, because this study helps to explore the positive impact of DMT among people having Autism in Indian setup and it can be suggested to include DMT in special school as regular curriculum for betterment of those having neurodevelopmental disorder like Autism.

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### **Conflict of Interest**

The author declared no conflict of interest.

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