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Original article

Effectiveness of dance movement therapy on attention deficit hyperactivity disorder children aged between 6-12 years

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Abstract

Introduction: Attention Deficit Hyperactivity Disorder (ADHD) is one of the most common behaviour disorders of childhood. Mental health and school practitioners are increasingly faced with the challenge of assessing children and adolescents who might have ADHD. The purpose of the study was to assess the effectiveness of dance movement therapy (DMT) among ADHD children. **Methods**: Data collection was done using demographic proforma; SNAP IV rating scale and an opinionnaire. **Results**: Analysis revealed post-test teacher and parent mean scores were significantly lower than the pre-test teacher and parent mean scores i.e. the t-value for teacher is $t_{(29)=}16.81$ and for parent is $t_{(29)}=15.74$.This significant reduction in the post-test scores revealed that there was an improvement in the ADHD assessment scores done by the teachers and parents. **Conclusion:** Based on the findings it is concluded that DMT was highly effective as a complementary therapy to treat children with ADHD.

Keywords: Attention Deficit Hyperactivity Disorder (ADHD), Dance Movement Therapy (DMT), Effectiveness.

INTRODUCTION

Attention Deficit Hyperactivity Disorder (ADHD) is a condition that becomes apparent in some children in the preschool age and it is one of the most common childhood onset psychiatric disorders that affect school age children. In a classroom of 25 to 30 children, it is likely that at least one will have ADHD. Boys are more commonly affected by ADHD than girls. It is a disruptive behavioural disorder with early childhood onset, characterized by symptoms of inattention, hyperactivity and impulsivity (American Psychiatric Association, 1994). Koshland, Wilson and Wittaker (2004) found that the Dance Movement Therapy (DMT) fostered social interactions and expression of feelings as well as gaining self-control. According to studies done by Gronlund, Renck and Weibull (2005), there is a strong relationship between motor-perception dysfunction and ADHD, which is why a movement intervention, such as DMT could serve as an appropriate treatment method. As a form of expressive therapy, DMT is founded on the basis that movement and emotion are directly related. The ultimate purpose of DMT is to find a healthy balance and a sense of wholeness [American Dance Therapy Association (ADTA), 2007]. In DMT, movement interaction is utilized to attain therapeutic goals. This therapy helps in enhancing emotional-physical unity of individuals, effecting changes in feelings, cognition and physical functioning. It can be used with varied age groups of children in and outside classroom situations. It can be modified to suit a wide range of clinical categories; the mentally challenged, physically disabled, slow learners, emotionally disturbed, the visually and hearing impaired, children with cerebral palsy and autism, etc. (Kashyap and Narthaki, 2002).The incidence of ADHD in different countries varies. Among the children of United States, the prevalence ranges from 4% to 12% (Brown, et al., 2001). In Indian literature, the prevalence of ADHD in children has been found to range from 1% to 15.5%. A clinical profile carried out in India in 2000 pointed out that prevalence of ADHD is 10-20% (Prahbhjot and Pratibha, 2000). There is a dearth of literature related to effectiveness of DMT among ADHD children. Hence, the aim of the study was to find out the effectiveness of DMT among ADHD children.

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MATERIALS AND METHODS

A quasi-experimental design was adopted to determine the effectiveness of DMT on ADHD children. Demographic proforma, SNAP IV (Swanson Nolan and Pelham, version IV) teacher and parent rating scale and opinionnaire of the parents were used to assess the effectiveness of DMT among ADHD children.

The constructed tools such as demographic proforma and opinionnaire on DMT along with the objectives and criteria were given to eleven subject experts from the field of child health nursing, paediatric medicine and psychiatric medicine for the content validity. The validity index was 0.94. We used short version of SNAP IV teacher and parent rating scale, which included 18 items from Diagnostic and Statistical Manual of Mental Disorders (DSM) IV (1994) criteria for ADHD, for the two subset of symptoms: inattention (items 1-9) and hyperactivity/impulsivity (items 10-18). It was a four-point response scored from 0-3. Subscale scores on SNAP IV were calculated by summing the scores on the items in the specific subset. The score for any subset is expressed as the average rating per item. The 5% cut off scores for teachers and parents are provided. The scores with 5% cut off for teacher is 2.56 and for parent 1.78 respectively for inattention; 1.78 for teachers and 1.44 for parents for the subset hyperactivity and impulsivity respectively. The combined ADHD scores for teachers and parents were found to be two and 1.67 respectively. In order to determine the average rating per item score, the score should fall within the top 5% scores and is considered significant. The tools were translated to Kannada language and retranslated to English to ensure the language validity. The reliability of the SNAP IV rating scale was obtained by using Cronbach's alpha. The obtained coefficient alpha (r) was 0.92 for Kannada version and 0.72 for English version. Both versions were used for data collection.

The screening phase consisted of dyad sample of teachers and parents; constituting parents of 200 children and 10 class teachers selected by simple random sampling technique and the sample size consisted of30 children selected based on their scores, parents (n=30) and their class teachers (n=10). The pilot study was conducted in Prestige International School at Mangalore. The data for the study was collected from Yenepoya School, Mangalore, Dakshina Kannada Primary School and Bharathi English Medium School, Ullal, Mangalore.

Data was collected by using self-administered rating scale and interview technique. Demographic proforma was filled by the investigator using interview technique and SNAP IV teacher and parent rating scale were administered to both - the parents and the class teachers. For preliminary screening data was collected from parents of 200 primary school children of classes first to fourth standard, who were selected by lottery method of simple random sampling. Among these, 30 children who met the criteria of ADHD according to SNAP IV teacher and parent rating scale were selected. The study hypothesized that the mean post-test ADHD assessment scores of children undergoing DMT will be significantly lesser than their mean pre-test ADHD assessment score.

DMT constituted specific child aerobics and songs required for the children to perform an aerobic exercise. The investigators prepared child aerobics compact disc (CD) constituting all aerobic movements lasting for 20 minutes. The CD was prepared in such a way that instructions along with aerobic moves are conjoined together according to the selected songs. The researchers selected the songs for the children, which enabled the phases required for an aerobic dance. The phases included warm up, moderate intense moves and cool down. The warm section selected for the study included child moves like marching, step-touch, step-touch with claps, double touch, double touch with hand moves and criss-cross. The moderate intense moves included heel clicks, heel clicks with body rotation, side moves and side moves with body waves and rotation, grape wine, grape wine with hand moves and fly, hand and leg exercises, walk and kick forward and backward, cheer up leader, knee lifts with biceps curls, jumping jacks, heel clicks, internal and external rotation of the hip, belly rotation, monster walk, salsa step with hand moves, bulb remover, ringing the bell, knee lifts, knee lifts with claps, squish walk with pizza hut and Mc-Donald's punching the air, stylish walk, hoping and flap the beaks, side rotations, grape wine with steering and peg-peg. These moves were repeated

for a maximum of 16 times and in between relaxation technique was added in the form of inhalation and exhalation. Cool down moves included stretches like leg stretch, shoulder stretch, forward and back stretches, shoulder press and shoulder rotation. The prepared CD along with the criteria checklist was given to three experts in the field of aerobics, nursing and music to ensure validity.

The selected children were given DMT by the researcher, who had undergone a course in child aerobics and obtained training certificate for specific child aerobics, which can be used in the study for DMT for a period of three weeks. Post-test was conducted in the third week to determine the effectiveness of DMT. Opinionnaire was given to parents of children who underwent DMT The data was collected and recorded systematically on each subject and organized in a way that facilitates computer entry.

RESULTS

Table 1: Frequency and percentage distribution of children according to age (n=30)

Demographic Variables	Frequency (f)	Percentage (%)
Age in Years		
6	6	20.00
7	9	30.00
8	8	27.00
9	7	23.00
Gender		
Male	22	73.33
Female	8	26.67
Religion		
Hindu	6	20.00
Christian	1	3.33
Muslim	23	76.67
Type of family		
Nuclear	9	30.00
Joint	21	70.00
Birth order of the child		
1	1	3.33
2	8	26.67
3	16	53.33
4 and above	5	16.67
Educational status of the parent		
Primary	2	6.67
High School	3	10.00
Pre University	13	43.33
Graduate	11	36.67
Post graduate and above	1	3.33
Occupational status of the parent		
Daily wage	1	3.33
Private sector	24	80.00
Government sector	2	6.67
Household work	3	10.00

The data presented in Table 1 show that 9 (30%) of the study participants were seven years old and eight (27%) were 8 years old. Table 1 also indicates that 22 participants (73.33%) were males and 8 (26.67%) were females. Maximum number of children 23 (76.67%) were Muslims. Majority 21(70%) belonged to joint family; 16(53.33%) of the children had the birth order of 3, 13(43.33%) of the parents had Pre University education and 24(80%) had private sector job.

Table 2: Frequency and percentage of school children based on types of ADHD as per teacher cut-off points (n=30)

Types	Teacher 5% cut-off scores	Pre-test	
		f	%
ADHD Inattentive Type	2.56	-	-
ADHD Hyperactive/ Impulsive Type	1.78	22	73.33
ADHD Combined Type	2.00	8	26.67

Table 2 shows that 22(73.33%) children were classified as ADHD hyperactive/impulsive and the remaining 8(26.67%) of the children as ADHD combined

Table 3: Frequency and percentage distribution of school children based on types of ADHD as per parent cut-off points (n=30)

Types	Parent 5% cut- off scores	Pre-test	
		f	%
ADHD Inattentive Type	1.78	-	-
ADHD Hyperactive/ Impulsive Type	1.44	3	10.00
ADHD Combined Type	1.67	27	90.00

Table 3 shows that 10%of the children were classified as ADHD hyperactive/impulsive and the remaining 90% as ADHD combined.

Table 4: Pre-test and post-test SNAP IV teacher scores (n=30)

Teacher scores	Range	Mean	SD
Pre-test	3- 2	2.186	0.3014
Post-test	1.33-0.38	0.915	0.2847

Table 4 shows that the post-test mean SNAP IV teacher score (0.915 ± 0.2847) was lower than the pre-test mean SNAP IV teacher score (2.1860.3014±). This difference between the pre-test mean scores and the post-test mean score is significant.

Significance of difference between the pre-test and post-test ADHD scores of teachers

To find the true difference between means of pre-test and post-test ADHD scores, 't' value is calculated. To test the level of significance at 0.05, null hypothesis was stated as:

H_{01}: There is no significant difference in post-test ADHD assessment score by parents and teachers in comparison to pre-test, after the DMT to primary school children. The data is shown in Table 5.

Table 5: Mean, standard deviation, standard error and 't' value of pre-test and post-test ADHD score according to teachers (n=30)

Scores	Mean	SD	SE	t-test
Pre-test	2.186	0.3014	0.0756	16.812
Post-test	0.915	0.2847		

$t_{(29)}$= 2.05 p<0.05

Table 5 shows that the post-test score is lower than pre-test score. The 't' value was found to be significant; (t_{29}) = 16.812. This indicates that DMT is effective in terms of reducing the ADHD scores.

Table 6: Range, Mean and Standard deviation of pre-test and post-test SNAP IV parent scores (n=30)

Parent scores	Range	Mean	SD
Pre-test	2.6- 1.67	2.187	0.237
Post-test	2.0-0.38	1.06	0.313

The data presented in Table 6 shows that the post-test mean SNAP IV parent score (1.06 ± 0.313) was lower than the pre-test mean score (2.187± 0.237).

To find the true difference between means of pre-test and post-test ADHD scores of parents, 't' value is calculated and presented in Table 7.

Table 7: Mean, standard deviation, standard error and 't' value of pre-test and post-test ADHD score of parents (n=30)

Scores	Mean	SD	SE	t-test
Pre-test	2.187	0.237	0.0716	15.74
Post-test	1.06	0.313		

$t_{(29)}$= 2.05 p<0.05

Table7 shows that the post-test score is lower than pre-test score. The 't' value was found to be significant; $t_{(29)}$ = 15.74. Hence, the null hypothesis was rejected and concluded that there is significant difference in pre-test and post-test scores. This indicates that the DMT is effective in terms of reducing the ADHD scores.

Table 8: Comparison of pre-test and post-test scores in terms of level of ADHD scores according to teachers (n=30)

Types	Teacher 5% cut- off scores	Pre-test		Post- test	
		f	%	f	%
ADHD Inattentive Type	2.56	0	0	0	0
ADHD Hyperactive/ Impulsive Type	1.78	22	73.33	0	0
ADHD Combined Type	2.00	8	26.67	0	0

Table 8 shows that the ADHD types according to school teachers decreased in post-test, in comparison to pre-test. This indicates that DMT was effective in terms of reducing the ADHD scores.

Table 9: Comparison of pre-test and post-test scores in terms of level of ADHD scores according to the parents (n=30)

Types	Parent 5% cut- off scores	Pre-test		Post-test	
		f	%	f	%
ADHD Inattentive Type	1.78	0	0	0	0
ADHD Hyperactive/ Impulsive Type	1.44	3	10	6	20
ADHD Combined Type	1.67	27	90	1	3.33

Table 9 shows that the ADHD types according to parents decreased comparatively in post-test, in comparison to pre-test. This indicates that DMT was effective in terms of reducing the ADHD scores.

Description of opinionnaire of the parents on DMT

All parents agreed that their children were actively and happily participating in the dance therapy and they would like to send their children again for the therapy. All parents agreed strongly that their children gained confidence. Parents also expressed that they were ready to recommend this therapy to their relatives and friends. Among the parents, 80% strongly agreed that their child started to perform daily activities on their own, developed patience in which he / she waited for his/ her turn in a line and had improved social relationship with peer group members. Sixty per cent of the parents strongly agreed that the child has improved in communication skills and the time provided for dance therapy

was adequate while 40% of parents were unable to decide whether time provided for dance therapy was adequate or not.

DISCUSSION

The study reveals that there was significant reduction in the post-test scores of children with ADHD, indicating that there was an improvement in the ADHD assessment scores done by the teachers and parents for children, who were exposed to DMT. Based on the findings it is safe to conclude that DMT is highly effective as a therapy to treat children with ADHD. Based on post-test assessment of teachers no subject was categorised as having ADHD. However based on parents' assessment it is found that seven children (out of 30) were found to be having symptoms of ADHD. It was found from this study that DMT is effective in children with ADHD. Further, based on the study ADHD is found to be prevalent among school going children, which can be treated with intervention like DMT.

ADHD is a commonly occurring behavioural disorder among children. Incorporating various interventional therapies will help in promotion of health in terms of meeting the physical needs of the child and also in the overall mental and social development of the child.

Further research is needed to uncover common attributes in children; common causes of ADHD; and how families manage the disorder. A need for extensive research regarding the management of ADHD in children is needed. Research should be done in every step of assessment of children with ADHD using different interventional therapies. The present study is a small step towards understanding the effect of different interventional therapies. The study findings are restricted to the samples included in the study only. The sample size was small, hence difficult to generalize the finding of the study.

CONCLUSION

ADHD is a common behavioural disorder in children that requires multidimensional therapy. DMT is highly effective as a complementary therapy to treat children with ADHD.

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