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### Full Length Research Paper

## Evaluating the Impact of Aerobic Dance on Flexibility and Agility in Children with Intellectual Disabilities

Dr. Poonam Kaushik<sup>1\*</sup> and Dr. Vikas Kaushik<sup>2</sup>

<sup>1</sup>-Sports Officer, Kasturbagram Rural Institute, Kasturbagram, Indore, India.

<sup>2</sup>-Sports Officer, Nirbhay Singh Patel Govt. Science College, Indore, India.

### ARTICLE DETAILS

**Corresponding Author:**  
Dr. Vikas Kaushik

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### ABSTRACT

To assess the impact of aerobic dance on the flexibility and agility of intellectual disabilities, 50 educable mentally retarded children, boys and girls of age group nine to sixteen years studying at the National Institute for Mentally Handicapped, Delhi were selected, the health conditions and I.Q level of subjects were checked from the school records. The measures applied for the collection of data were the Fleishman twist and touch test and the zig-zag running test. A week-long orientation programme on aerobic dance was given to acquaint subjects with doing exercises on music with proper rhythm. A pre-test was taken a regular programme of aerobic dance was administered for 12 weeks, with 4 days a week. The post-test was administered after every four weeks of aerobic dance. The aerobic dance program had a significant effect on flexibility and agility ( $p > .05$ )

### 1. Introduction

Aerobic dance is defined as rhythmic, continuous movements performed to music that increase heart rate and improve cardiovascular fitness. It consists of dynamic stretching and movement patterns, a diversity of steps, turns, and jumps designed to improve range of motion and agility. When this exercise with music is adapted for children with intellectual disabilities, it becomes an effective tool for improving physical health and social interaction. Children learn to synchronize their movements with music, which enhances their flexibility, agility, proprioception, and overall well-being. Physical education and aerobic dance programs for mentally retarded children are appealing areas for inquiry and investigation. No doubt in the West; it has emerged as a distinctive discipline various concepts such as adapted Physical Education and Sports for the handicapped have been developed and experimented upon. Despite this, vast areas in the field are untouched and unexplored. Regular physical education appears to be moving towards increased freedom for the student. It is assumed freedom will foster creativity, cognition, self-discipline, and a greater sense of responsibility for self-actualization.

Dance teaches children to concentrate and focus. Dance stimulates cognitive learning by providing experiences in which children learn and retain various concepts. They retain more of what they learn because their whole body is involved in the learning process. Their self-esteem is increased through dance when they participate in activities that validate their ideas. Aerobic exercise is any physical activity that requires your heart rate to reach at least 60% of your maximal heart rate for an extended period. An aerobic dance programme contributes to physical fitness by providing aerobic and improving cardiorespiratory endurance, strength, flexibility and muscular endurance. (Leigh, Debra L, 1994)

Imagery practice was an effective method of increasing the motor performance of children with mild handicaps on both peg board and pursuit rotor tasks. Screws (1991) Beecher's (1997) study showed a significant correlation between time and

\* Author can be contacted at: Sports Officer, Nirbhay Singh Patel Govt. Science College, Indore, India.

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frequency of heads held erect for all study participants. The present study was undertaken to evaluate the impact of aerobic dance on the flexibility and agility of children with intellectual disabilities, especially educable mentally retarded children. Mental retardation is perhaps the greatest single source of human suffering. The child born is not only a tragic human figure in himself living yet not alive, since he is never to be what he could have been, but he is the innocent agent of profound and endless suffering to his family and a perpetual burden to his society. Jouira, Ghada; Alexe, Cristina Ioana; Zine Abidine, Khawla; Rebai, Haithem; Mocanu, George Danuț; Cojocaru, Adin Marian and Dragomir Luciana (2024) investigated the effects of an 8-week aerobic dance intervention on postural balance in 41 children (aged 9 to 11).

The children were randomly assigned to either an aerobic dance group (ADG) or a control group (CG). Postural balance was evaluated using center of pressure (CoP) excursions. Assessments were conducted on both firm and foam surfaces in bipedal and unipedal stances under open-eyes (OE) and closed-eyes (CE) conditions. CoP values were analysed for both medial-lateral (ML) and anterior-posterior (AP) surfaces. The ADG showed significantly decreased CoP velocity (Vm) values during various conditions (firm bipedal CE, unipedal OE, foam bipedal OE and CE, and foam unipedal OE). Aerobic dance intervention improved postural balance, demonstrating adaptability and enhanced stability. Jayakumar. K (2021) studied the Impact of Aerobic Dance on the flexibility of high school boys. The subjects were divided into two equal groups (Group A and Group B), where an aerobics dance training program was provided to the experimental group. Flexibility was assessed using the Sit and Reach Test. Significant improvement in flexibility was observed after the training program. Esposito. P; Marascio. C (2023) reviewed and examined various dance programs (including ballet) and their impact on gross motor skills in children. Twenty intervention groups across different studies experienced statistically significant improvements in motor skills.

The purpose of the study was to determine the effect of aerobic dance exercises on the flexibility and agility of educable mentally retarded children.

## 2. Methodology

### 2.1 Study area

The study was conducted on the educable mentally retarded students of the National Institute of Mentally Handicapped, Lajpat Nagar II, Delhi. The variables selected for the study were flexibility and agility. The measures applied for the collection of data were the "Fleishman twist and touch test" for flexibility and the "zigzag running test" for agility. Fifty boys and girls of age group nine to sixteen years were selected as subjects for the study. The health conditions and I.Q. level of the subjects were checked from the records of the school. Before taking the test, the subjects were given a one-week orientation program so that they became acquainted with the exercises on the music with proper rhythm. After conducting the pre-test and collection of initial data, the regular exercise programme of aerobic dance was administered for twelve weeks. The program was conducted for 4 days a week. The collection of data of post-tests was taken every four weeks during the aerobic dance exercise programme. The program of aerobic dance was administered based on simple to complex and progression of load, after every four weeks.

### 2.2 Method

The study was conducted using an experimental training method. All the subjects had undergone an aerobic dance training programme to find the effect of the aerobic dance programme on the flexibility and agility of the subjects. The mentally retarded students initially had undergone an orientation on the aerobic dance exercise programme with the purpose to deputize doing and enjoying the exercise with music and beats. The data was subject to analysis of variance and the post hoc analysis test was applied if the F values were found significant.

## 3. Results

The results of the analysis of variance of flexibility on educable mentally retarded children have been given in Table 1.

**Table 1.** Analysis of variance of flexibility for the pre-test and post-tests

Sources of Variance	Df.	Sum of square	Mean Square	F value
Between groups	3	258.57	86.19	4.92*
Within groups	196	3433.87	17.51	

\* Significant at .05 level of confidence  $F(Df3/196)$  at .05 level = 2.68

It is evident from the above table that the obtained 'F' value of 4.92 was found to be significant at .05 level of confidence as the required value is 2.68. Since the differences were significant among the pre-test and post-tests in flexibility, Scheffe's post hoc test was applied to determine the significance of the difference in paired means. The post hoc analysis for the paired mean for flexibility has been presented in Table 2.

**Table 2.** Mean difference of flexibility for the pre-test and post-tests

	A (Pre-Test)	B (I Post-Test)	C (II Post-Test)	D (Final Post Test)	Difference
Mean	17.92	16.9	-	-	1.02
Mean	17.92	-	15.88	-	2.04*
Mean	17.92	-	-	17.87	3.05*
Mean	-	16.9	15.88	-	1.02
Mean	-	16.9	-	14.87	2.03*
Mean	-	-	15.88	14.87	1.01

\*Critical difference at .05 level is 1.640.

The results of the analysis of variance on agility for educable mentally retarded children have been given in Table 3.

**Table 3.** Analysis of variance of agility for the pre-test and post-tests

Sources of Variance	Df.	Sum of square	Mean Square	F value
Between groups	3	166.255	55.418	6.875*
Within groups	196	1579.94	8,060	

\*Significant at .05 level of confidence  $F(df_3/196)$  at .05 lever = 2.68.

It is evident from the above table that the obtained 'F' value of 6.875 was found to be significant at .05 level of confidence as the required value being 2.68. Since the differences were significant among the pre-test and post-tests in the agility, the scheffe's post hoc test was applied to determine the significance of difference in paired means. The post hoc analysis for the paired mean for agility has been presented in Table 4.

**Table 4.** Mean difference of agility for the pre-test and post-tests

	D (Final Post Test)	C (II Post Test)	B (I Post-Test)	A (Pre-Test)	Difference
Mean	15.88	15.52	-	-	0.36
Mean	15.88	-	14.4	-	1.48*
Mean	15.88	-	-	-	2.30*
Mean	-	15.52	14.4	-	1.12*
Mean	-	15.52	-	-	1.94*
Mean	-	-	14.4	-	0.82

\*Critical difference at .05 level is 1.112.

The Aerobic dance program had a significant effect on the flexibility of educable mentally retarded children, with the F value being (4.92). The Value at .05 level of confidence is 2.68. The significant effect on flexibility could be seen after eight weeks of training program and more training could result in better effect. Similarly, the aerobic dance program had a significant effect on the agility of educable mentally retarded children, as the F value found was (6.87) which was much higher than the tabulated value required to be significant at .05 level of confidence (2.68). The significant effect on agility could be seen after eight weeks of the training program and the maximum effect was seen after twelve weeks of the training program.

#### 4. Discussion

Clayton (1981) developed a high-intensity physical activity programme for overweight mentally retarded children. He found that in addition to favorable weight and % of body fat during the programme, improved motor coordination, improved body functioning, and increased enjoyment of team efforts. The fitness of moderately mentally retarded boys can be improved through developmental activities but the prescription of specific activities is critical to the success of such a program William (1978). Cavanaugh (1969) in his 22-week physical education programme on educable mentally retarded and minimally brain damaged children showed significant improvement in measures of strength, power, balance, agility, cardio-vascular efficiency, coordination, and speed of response, and the least amount of improvement was found in flexibility. Allen (1990) found a significant difference between the scores of 54% of the experimental group and 75% of the control group on self-concept after a two-week intensive dance/movement education. Abbas Azhar, Usha Tiwari, Dharendra Tiwari (2023) did a study comparing coordination abilities among Sub Junior, Junior, and Senior Hockey Players conducted on 90 subjects. The variables included Balance ability and Rhythmic ability. Thirty subjects from each level were selected. ANOVA was used to compare the abilities. Results showed significant differences in balance ability between sub-juniors, juniors, and seniors, with seniors performing better than juniors. Rhythmic ability also showed significant differences between age groups. Doley, M.M; Tiwari, Usha; Tiwari. D(2023) study involved 120 handball players divided into three groups: sub-juniors, juniors, and seniors. The researchers

used one-way analysis of variance (ANOVA) to compare the balance and rhythmic abilities among these groups. The findings indicate significant differences in both balance and rhythmic abilities, with seniors outperforming juniors and sub-juniors. The studies done on children with various intellectual abilities show that undergoing different physical activity programmes has impacted them significantly by improving their motor abilities, different fitness variables, and self-concept. Physical and motor activities can be further improved and maintained by regular exercise programmes.

## 5. Conclusion

The aerobic Dance programme had a significant effect on the agility and flexibility of the educable mentally retarded children. The desirable effect on flexibility could be seen after eight weeks of training program and more training could result in better effect. The effect on agility could be seen after eight weeks of the training program and the maximum effect was seen after twelve weeks of the training program.

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