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INFLUENCE OF A 12-WEEK AEROBICS DANCE EXERCISE PROGRAM ON COGNITIVE FUNCTION AND ACADEMIC PERFORMANCE AMONG ENGINEERING STUDENTS

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Abstract

Problem Statement: The sedentary lifestyle common among college students can harm their cognitive performance and academic results. Finding effective, non-invasive solutions is important. **Approach:** The present investigation encompassed a sample of 60 undergraduate Engineering students of RNSIT, comprising an equal distribution of 30 males and 30 females, all aged between 18 and 22 years. The participants were randomly allocated into two distinct groups: an intervention group (n=30) that engaged in a structured 12-week aerobic dance regimen consisting of three 60-minute sessions weekly, and a control group (n=30) that received no such intervention. We evaluated cognitive performance utilizing the Mini-Mental State Examination (MMSE) and assessed academic performance through Grade Point Average (GPA). **Purpose:** The primary objective of this study was to analyse the impact of a systematic aerobic dance intervention on students' cognitive functioning and academic outcomes. **Results:** The post-intervention MMSE scores exhibited a statistically significant enhancement in the intervention group relative to the control group ($p < 0.01$), as did the GPA scores ($p < 0.05$). Effect sizes indicated moderate to substantial improvements. **Conclusions:** The implementation of a 12-week aerobic dance program resulted in significant advancements in both cognitive and academic performance, thereby endorsing its integration within university health and wellness initiatives.

Keywords: Aerobics, Dance Fitness, Cognitive Function, Academic Performance, Engineering.

1. INTRODUCTION

Cognitive development is intricately linked to academic achievement among students. Numerous scholarly investigations indicate a favourable correlation between physical activity and neurocognitive functioning. Dance-oriented aerobic regimens are particularly advantageous as they necessitate rhythmic coordination, cardiovascular exertion, and cognitive concentration. Nonetheless, there exists a paucity of data pertaining to collegiate populations in India. This research aims to examine the effects of a 12-week aerobics dance intervention on cognitive and academic performance among Engineering students of RNSIT.

2. MATERIALS AND METHODS

2.1 Participants

Sixty undergraduate students (30 males and 30 females) from RNSIT, aged 18 to 22, volunteered for this study. Engineering Students were randomly assigned to the intervention or control group to maintain gender balance.

2.2 Intervention

The intervention group participated in a 12-week aerobics dance program with sessions three times per week. Each 60-minute session included a 10-minute warm-up, 40 minutes of choreographed aerobic dance, and a 10-minute cooldown.

2.3 Instruments

Cognitive function was assessed using the Mini-Mental State Examination (MMSE), a common tool for screening cognitive status. Academic performance was measured using the semester GPA obtained from university records.

2.4 Procedure

Baseline data for MMSE and GPA were collected prior to the intervention. After 12 weeks, post-test data were gathered for both groups under similar conditions. The control group continued with its regular academic routine without any additional physical activity.

2.5 Statistical Analysis

Data were analysed using SPSS v25.0. Paired and independent samples t-tests were used to examine within- and between-group differences. Effect sizes were calculated using Cohen's d. Statistical significance was set at $p < 0.05$.

3. RESULTS

Table I. MMSE Scores Before and After Intervention

Group	Pre-Test (Mean ± SD)	Post-Test (Mean ± SD)	p-value	Effect Size
Intervention	25.6 ± 2.1	28.3 ± 1.8	<0.01	0.78 (large)
Control	25.4 ± 2.3	25.6 ± 2.0	0.32	0.08

Table II. SGPA Scores Before and After Intervention

Group	Pre-Test (Mean ± SD)	Post-Test (Mean ± SD)	p-value	Effect Size
Intervention	7.1 ± 0.4	7.8 ± 0.3	<0.05	0.65 (moderate)
Control	7.0 ± 0.5	7.1 ± 0.5	0.28	0.14

4. DISCUSSION

The findings of this study support previous research that shows aerobic exercise boosts cognitive function by improving blood flow and neuroplasticity. The dance-based format added complexity and enjoyment, which could improve motivation and adherence. The increased GPA scores suggest that the cognitive benefits led to better academic results. However, the study's limitations include its short duration and reliance on GPA as the sole academic measure. Future research should incorporate a longer follow-up and a wider variety of cognitive tests to make results more generalizable.

5. CONCLUSIONS

A 12-week aerobics dance exercise program produced significant improvements in cognitive function and academic performance among undergraduate students. These results suggest that similar physical activity programs could be beneficial in college curricula for fostering mental and academic growth.

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