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A comparative study on selected health related fitness components between Bharatanatyam dancers and rhythmic gymnasts

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Abstract
Present study was conducted to investigate, whether any differences existed in the performance on selected health related fitness components between the Bharatanatyam Dancers and Rhythmic Gymnasts. For conducting this study, total thirty female subjects of 15 to 18 years were selected from different district of West Bengal, India. Among them 15 subjects were Bharatanatyam Dancers from Bhabna Dance Academy and resting 15 subjects were Rhythmic Gymnasts from Khamarpara tarun samity west Bengal. Both groups have more than 4 years of experience. Criteria measured for this study were muscular strength, muscular endurance, and flexibility. Muscular strength was determined by vertical jump, Muscular endurance was measured by bent knee sit up and Flexibility was measured by sit and reach test. From this study it was found that, there was significant difference between Bharatanatyam Dancers and Rhythmic Gymnasts in muscular endurance (t = 2.701*) only. From this study it was also observed that rhythmic gymnasts were better in all selected health related fitness components than Bharatantyam dancers. With limitations, it may be concluded that practice of rhythmic gymnastics is better to improve the health related fitness components than practicing of bharatanatyam dance.

Keywords: Muscular strength, muscular endurance, flexibility, Bharatanatyam, rhythmic gymnastics

Introduction
Health related fitness refers to the ability of an individual to carry out the life routines without undue fatigue with ample energy. It is that state of wellbeing in which every individual would seek protection against diseases, tackle problem being obese/over-weight, manage muscle and joint disorders, strive to be mentally balanced and socially well adjusted [1]. There are so many types of exercises, games and sports to improve the health related fitness. Dance and Gymnastics are two different kinds of attractive exercises for women. Both the exercises perform on the base of music. From vedig period dance plays a vital role to maintain health status and Bharatanatyam is one of the oldest classical dance forms of India, originating in the temples of Tamil Nadu, traditionally performed as an offering to the deities. Bharatanatyam served as both a spiritual practice and a means of preserving mythological narratives, moral values, and cultural heritage through movement, rhythm, and gesture [2]. Rhythmic gymnastics is a modern Olympic discipline that blends elements of ballet, dance, and gymnastics with the skillful manipulation of apparatus such as the ribbon, hoop, ball, clubs, and rope [3]. Unlike artistic gymnastics, which focuses on acrobatic strength and apparatus-based stunts, rhythmic gymnastics emphasizes grace, flexibility, musicality, and coordination, creating a seamless harmony between movement and music. Rhythmic gymnastics emerged in the early 20th century from a synthesis of rhythmic movement systems, expressive dance, and Swedish free gymnastics. Influences from François Delsarte's expression theory, Émile Jaques-Dalcroze's eurhythmics, and Rudolf Laban's movement analysis contributed to its foundation [4]. Scholarly research identifies rhythmic gymnastics as a sport requiring a unique combination of flexibility, coordination, balance, agility, and musical interpretation [5]. So, the purpose of the present study was to find out which type of exercise helps to maintain and also to improve the selected health related fitness in a better way. It was hypothesised that there would be no significant differences between Bharatanatyam dancers and Rhythmic Gymnasts in selected health related fitness components.

Methods and Materials

For conducting this study total thirty female of 15-18years were selected from West Bengal as subjects. Among them fifteen subjects were Bharatanatyam dancers and resting fifteen were the Rhythmic Gymnasts. All of the subjects have 4 years of experience. Bharatanatyam dancers were selected from Bhabna Dance Academy and Rhythmic Gymnasts were selected from Khamarpara tarun samity west Bengal. Criteria measured for this study were Flexibility, Muscular strength and Muscular endurance. Flexibility was measured by sit and reach test, Muscular strength was measured by vertical jump test and Muscular endurance was measured by bent knee sit up test [6]. Mean and Standard Deviation (SD) were used as descriptive statistics and "t" test was used to find out the differences between the two means. Level of significance was set at 0.05 level of confidence.

Results and Discussion

Table 1: Mean and Standard Deviation (SD) of Personal data (Age in year, Height in centimetre and weight in kg) of selected groups.

Variables Groups	Age (Year)		Height (cm)		Weight(kg)	
	Mean	SD	Mean	SD	Mean	SD
Bharatantyam Dancers	16.93	±1.16	154.5	±2.06	51.73	±5.31
Rhythmic Gymnasts	16.18	±1.47	157.8	±3.69	48.07	±5.95

Table-1 showed the mean and SD of personal data (age, height and weight) of Bharatanatyam dancers and Rhythmic gymnasts. From table-1 it was observed that the mean age and standard deviation of age of Bharatanatyam dancers and Rhythmic gymnasts were 16.93±1.16 year and 16.18±1.47 year respectively. The mean height of the Bharatanatyam dancers and Rhythmic gymnasts were 154.5±2.06 cm and 157.8±3.69 cm respectively. Table-1 showed the mean weight of the subjects. The mean weight of Bharatanatyam dancers and Rythmic gymnasts were 51.73±5.31kg and 48.07±5.95kg.

Table 2: Mean and Standard Deviation (SD) of selected variables of two groups.

Variables Groups	Flexibility(cm)		Muscular Endurance (No.)		Muscular strength (cm)	
	Mean	SD	Mean	SD	Mean	SD
Bharatanatyam Dancers	20.27	±9.13	24.27	±5.83	30.40	±4.86
Rhythmic Gymnasts	21.18	±5.42	29.27	±4.16	33.47	±4.09
"t"	t = 0.3336		t = 2.701*		t = 1.87	

* = Significance at 0.05 level of confidence, at Degree of Freedom = 28, ns = not significant, [7]

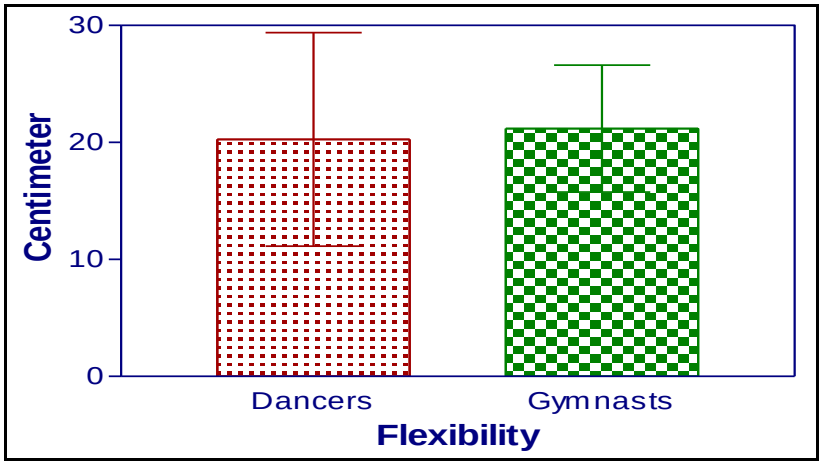

Fig 3: Graphical representation of the mean and SD of flexibility of selected groups.

Table-2 showed mean and standard deviation of flexibility of the selected groups. From table-2 it was found that the mean and SD of flexibility of Bharatanatyam dancers and Rhythmic gymnasts were 20.27±9.13 and 21.18±5.42. From table-2 it was observed that there was no significant difference (t = 0.33) between Bharatanatyam dancers and Rhythmic gymnasts.

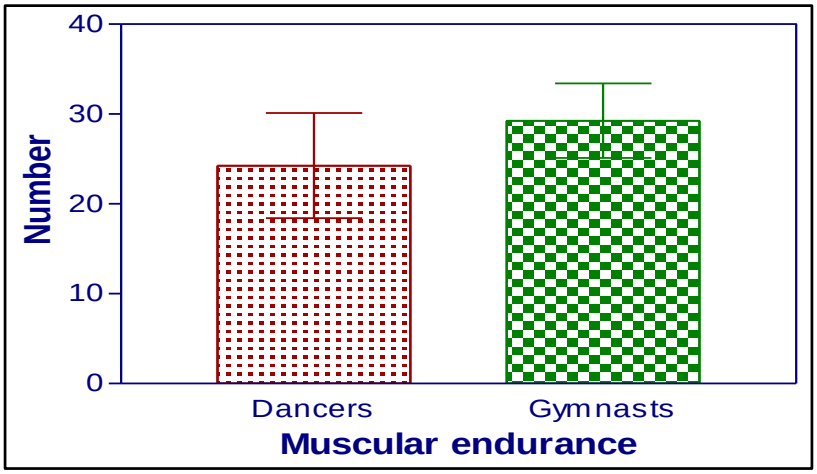

Fig 4: Graphical representation of the mean and SD of muscular endurance of selected groups.

From table-2 it was observed that the mean and SD of muscular endurance of Bharatanatyam dancers and Rhythmic gymnasts were 24.27±5.83 and 29.27±4.16 respectively. Rhythmic gymnasts display a significantly higher muscular endurance than Bharatanatyam dancers (t = 2.701*), likely due to high repetition of body conditioning exercises.

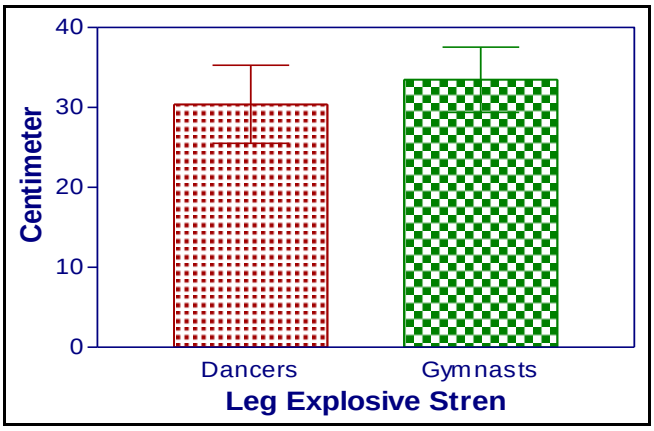

Fig 6: Graphical representation of the mean and SD of leg explosive strength of selected groups.

From table-2 it was also found that, in muscular strength, the rhythmic gymnasts (33.47±4.09) were better than Bharatanatyam dancers, though there was no significant difference (t = 1.87) between the selected groups. Ghosh Sandip (2015) was conducted a comparative study on motor ability between bharatnatyam dancers and gymnasts of west Bengal. He observed that the professional gymnasts were significantly better in explosive leg strength, muscular strength, and muscular endurance ability than the Bharatnatyam dancers and he also found no significant difference in agility between the bharatanatyam dancers and professional gymnasts [8]. Present study also revealed the same scenario; rhythmic gymnasts were the better performer.

Conclusion

With limitations, from this study it may be concluded that the null hypothesis was partially rejected. Though dance has been a good traditional way of improving and maintaining health related fitness science the primitive age, but in modern days, practicing rhythmic gymnastics improves the health related fitness in a better way.

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