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MODERATE HIGH INTENSITY DANCE TRAINING ON VO_2 MAX AMONG AEROBIC, BHARATHANATYAM AND KANDYAN DANCERS

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Abstract:

The purpose of this study was to find out the effect of moderate high intensity Aerobic, Bharathanatyam and Kandyan dance training on VO_2 max. To achieve the purpose ninety (N=90) women dancers were selected from Jaffna, Sri Lanka, and their age were ranged between 17 and 18 years. They were classified in to Aerobic dance [(AD)(n=30], Bharathanatyam Dancers [(BD) (n=30] and Kandyan Dancers [(KD)(n=30] and practice their respective dance training, 45-60 min / day / three days / week over the period of twelve weeks. An exercise intensity start from 60 % of the maximum heart rate and 2% rule was implemented in every two weeks. VO_2 max was assessed for all the selected subjects by Queen's step test before and after the intervention programme, The pre-test and post test means of experimental groups I, II and III were tested for significance by applying dependent 't' to find out the difference between pre and post test. After eliminating the influence of pre-test on post-test means of experimental groups the analysis of variance (ANOVA) was used to find out the mean gain differences. In addition to this, Scheffe's post-hoc test was employed, if the F-ratio of the mean gain was significant. In all the cases 0.05 level of confidence was fixed to test the significance. The result of the study on VO_2 max indicates that there was a significant different among the Aerobic, Bharathanatyam and Kandyan Dancers. From the results it was concluded that there was a significant difference between Aerobic and Bharathanatyam, Aerobic and Kandyan Dance groups on VO_2 max. However between Bharathanatyam dance and Kandyan dance insignificant difference was observed on VO_2 max.

Keywords: Bharathanatyam, Kandyan Dance & VO_2 max.

Introduction:

Dance has a huge potential for both young and old in contributing to healthier lifestyles. It is an art form which can truly engage people both mentally and physically and is particularly appealing to girls and those who are turned off by competitive sports. Dance are dependent on social, cultural, aesthetic, artistic and moral constraints and range from functional movement to virtuoso techniques such as Bharathanatyam, Ballet, Aerobic dance and Kandyan Dance and etc. It is involves the body, emotion and mind, it is both a physical activity and a means of expression and communication

Aerobic dance: In the early 70's, Jacki Sorenson developed a fitness program now known as aerobic dance, which was designed to improve cardiovascular endurance (1). It involves choreographed routines made up from various dance steps and other movements including walking, running and skipping. It also involves muscle conditioning exercises for the abdominal, legs and arms (2). Aerobic dance is appropriate for the general public since skill and technique are not emphasized (3). **Bharatanatyam**: very popular dance form in South India. And oldest of all classical dance forms. The general etymology of Bharathanatyam is BHAva (expression) + RAga (music) + TAla(rhythm) + NATYAM(dance). The variety and style of the dance and musical accompaniment provide to the people tastes and performing them. **Kandyan Dance:** is a dance form that originated in the area called Kandy of the Central hills region in Sri Lanka. But today it has been widespread to other parts of the country. The dance waned in popularity as the support for the dancers from the Kandyan kings ended during the British period. It has now been revived and adapted for the stage, and is Sri Lanka's primary cultural export. Dance is an art form that generally refers to movement of the body, usually rhythmic and to music, used as a form of expression, social interaction or presented in a spiritual or performance setting. The ACSM defines aerobic exercise as "any activity that uses large muscle groups, can be maintained continuously, and is rhythmic in nature. It is a type of exercise that overloads the heart and lungs and causes them to work harder than at rest (4). Hence the purpose of the study was to find out the effect moderate high intensity aerobic, bharathanatyam and kandyan dance on vo_2 max.

Methodology:

To achieve the purpose ninety (N=90) women dancers were selected from Jaffna, Sri Lanka, and their age were ranged between 17 and 18 years. They were classified in to Aerobic dance [(AD)(n=30], Bharathanatym Dancers [(BD) (n=30] and Kandyan Dancers [(KD)(n=30] and practice their respective dance training, 45-60 min / day / three days / week over the period of twelve weeks. An exercise intensity start from 60 % of the maximum heart rate and 2% rule was implemented in every two weeks. VO_2 max was assessed for all the selected subjects by Queen's step test before and after the intervention programme, The pre-test and post test means of experimental groups I, II and III were tested for significance by applying dependent 't' to find out the difference between pre and post test. After eliminating the influence of pre-test on post-test means of experimental groups the analysis of variance (ANOVA) was used to find out the mean gain differences. In addition to this, Scheffe's post-hoc test was employed, if the F-ratio of the mean gain was significant. In all the cases 0.05 level of confidence was fixed to test the significance.

Results:

't' values of experimental groups and magnitude of improvement on vo_2 max (ml/kg/min)

Groups		Pre-Test	Post-Test	R	't'	Magnitude of Improvement %
Aerobic Dance	$\bar{X}$	46.23	54.90	0.18	17.05*	18.75
	σ	2.07	2.30			
Bharathanatyam Dance	$\bar{X}$	45.02	50.48	0.36	6.18*	12.13
	σ	1.63	4.00			
Kandyan Dance	$\bar{X}$	44.11	49.72	0.09	10.23*	12.72
	σ	1.70	2.63			

***Significant at .05 level of confidence. with df (2, 29) is 2.04**

ANOVA for mean gain on vo_2 max of experimental groups

	Groups			SOV	S.S	df	MS	'F' value
	AD	BD	KD					
Mean	8.73	5.46	5.60	**B**	205.10	2	102.55	7.63*
S.D	2.80	4.84	3.0	**W**	1169.34	87	13.44	

TV : 0.05 df 2 and 87 =3.10

Scheffe's test for the differences between the mean gains of vo_2 max

Aerobic Dance	Bharathanatyam Dance	Kandyan Dance	MGD	CI
8.73	5.46		3.27*	
8.73		5.60	3.13*	2.22
	5.46	5.60	0.14	

***Significant at 0.05 level of confidence.**

The result of the 't' shows, significant difference between pre and post-test on VO_2 max for all the experimental groups. From the results it was very clear that, all the three experiment groups were significantly improved VO_2 max level. The result of the study on VO_2 max indicates that there was a significant different among the Aerobic, Bharathanatyam and Kandyan Dancers.

However between Bharathanatyam dance and Kandyan dance insignificant difference was observed on VO_2 max.

Discussions:

Although dance is an artistic expression through the use of the body, and also a long process of physical, intellectual, and psychological preparation. Dance training, rehearsal, and performance do not elicit significant stimulus to result in increased aerobic fitness levels. Therefore, dancers often demonstrate low levels of aerobic fitness even though a strong aerobic foundation is necessary to meet the required workload.

It may indicate the associated dance training out comes could be affected by such difference in duration, intensity and frequency of dance they undergone. Regular dance training essential for maintain and developing the dancer's technique and coordination. The energetic demands during these training sessions stand in rather sharp contrast to those which can exist during stage performance. The result also shows that the aerobic dancers have better VO_2 max compare to bharathanatyam and kandyan dancers. Therefore intensity, duration and movement patterns of the dance influence on aerobic power such as VO_2 max, cardio respiratory endurance so on.

The literature indicates that changes in cardiorespiratory endurance, VO_2 max are directly related to the subject's initial fitness level and the frequency, intensity and duration of the training programme. Some aerobic type of activities, have close association with VO_2 max (6). It has been shown that arm work performed above the head produces a higher VO_2 max than the work performed bellow head level, due to an increased sympathetic tone (7). In general, dance students demonstrate lower maximal oxygen up-take $_{(\sim VO2max)}$ values compared with other athletes (8). Within the dance world, however, modern dancers have shown higher $_{\sim VO2max}$ values than ballet (9).

Through physical exercise, often beginning in childhood and continuing until retirement. Fitness programs, supplementary to traditional dance classes, have only recently been considered as a part of this process, most athletes where aerobic fitness and performance levels increase in parallel during their careers, dancers develop these two parameters independently. It may be suggested that moderate intensity aerobic type exercise supports to the dancers to enrich their theatre performance as well as quality of life.

Keenness to follow principles associated with sport training, that improve real opportunity to extend the dancer's career by simply applying sports science principles to dance training and performance. An awareness of these factors will assist dancers and their teachers to improve training techniques, to employ effective injury prevention strategies and to improve better physical conditioning. However, any change in the traditional training regimes must be approached cautiously to ensure that the aesthetic content of the dance is not affected by new training techniques. Since physiological aspects of performing dance have been viewed primarily in the context of aerobic, bharathanatyam and kandyan dance.

Physical inactivity and low cardio-respiratory fitness are recognized as important causes of morbidity and mortality [10, 11]. It is generally accepted that people with higher levels of physical activity tend to have higher levels of fitness and that physical activity can improve cardiorespiratory fitness [12]. Nourrey et al. showed in a prospective study that aerobic exercise improves pulmonary function and alters exercise breathing pattern in children [13]. Clark found that cardio-respiratory fitness significantly improved and breathlessness decreased over a wide range of physical work corresponding to activities of daily living [14].

Conclusion:

The aerobic, bharathanatyam and Kandyan dancers have to undergo special fitness training to improve VO_2 max level for achieve height of their professional dance career as well as better theatre performance.

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