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## Combined effects of plyometric and aerobic training with circuit training on selected motor fitness components and physiological variables among women kabaddi players

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### Abstract

Kabaddi is a game that uses the natural principles of functional development to help players ameliorate their abecedarian chops. Movement is an important part of the game, and it requires a lot of trouble and energy to keep up with the pace of the game. The ideal of this study was to explore the goods of an 8-week plyometric and aerobic training with circuit training on speed and breathe holding time of intercollegiate women kabaddi player's total 45 actors in this study. Treatment group I passed plyometric with circuit training, group II acted as aerobic with circuit training and group III control group. All forty five subjects were instated for pre and posttest on speed and breathe holding time. The plyometric and aerobic training with circuit training was given to the experimental group for 3 days per week (Monday, Wednesday, and Friday) for a period of eight weeks. The control group wasn't given any kind of training except their routine work. The speed (50 meter dash test in seconds) Breath holding time (breath holding test in seconds) were assessed ahead and after training period. The result from 'f' test and inferred that 8 weeks high intensity interval training treatment produced identical changes over speed and breathe holding time of inert collegiate women kabaddi players. Further, the findings verified the plyometric and aerobic training with circuit training is suitable protocol to bring out the desirable changes over speed and breathe holding time of inert collegiate women kabaddi players.

**Keywords:** Plyometric training, aerobic training, circuit training, speed, breath holding time and women kabaddi players

### Introduction

Traditional Circuit Training exercises of include push-up, sit-up, bench lifting, squat thrusts, stepping and dumbbell rising. These exercises are performed with or without apparatus. Circuit training aims at the development of the basic components of physical fitness including muscular. The plyometric training has been suggested to improve the muscular power of athletes originally; plyometric training is used to improve the explosive power of athletes. The traditional circuits training as the plyometric exercises are specific for explosive power development. As circuit training may include a number of different training exercises, some elementary plyometric exercises may be implemented in the stations of circuit training in this study to create a new plyometric circuit. Aerobic energy system covers at least ten minutes exercises. At this point circuit or traditional aerobic exercises included that point. Recovery, made possible by the high aerobic capacity, is important in sports that a large number of repetitions of a skill are important or in team sports where there are a large number of running circuits. (Yogmur Ozer, Ozlem Bozdal, Zarufe Pancar, 2017) <sup>[1]</sup> Aerobic Circuit training has the advantage of having advantages compared to ordinary circuits, but certainly and there must be a shortage of this method, circuit training will provide results or training effects that are more dominant to muscular endurance, which in turn will support the ability to aerobic. (Maniazhagu, 2017) <sup>[1]</sup>. So, the history and characteristics of kabaddi games is very interesting and important one like other traditional games and sports across the country. It is such a game in which aerobic capacity plays an important role to become an excellent kabaddi player.

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The present study has thus been designed to find out the effect of eight weeks of plyometric and aerobic training with circuit training of inter collegiate women kabaddi players.

**Hypothesis**

The hypothesis argued in this paper is that inert college women kabaddi players can significantly changes the speed and breath holding time by combining technical and tactical sessions with plyometric and aerobic with circuit training over a consecutive 8 weeks period.

**Materials and Methods**

To achieve the purpose of the study 45 inter collegiate women kabaddi players at the age group of 18-22 years were selected from PSG college of Technology, Coimbatore. The named subject was aimlessly assigned into three equal groups, correspond of fifteen each, videlicet plyometric with circuit training group (n = 15), aerobic with circuit training group (n = 15) and Control group (n = 15). The separate training was given to the experimental group the 3 days per weeks (Monday, Wednesday and Friday) for the training period of eight weeks. Players who freely agreed to share in this study will considered and include in this study. The control group wasn't given any kind of training except their routine. The estimated speed was assessed by 50 meter dash test unit of dimension in seconds) Breath holding time was assessed by breath holding test unit of dimension in seconds). The parameters were measured at birth and after 8 weeks of

plyometric and aerobic training with circuit training were examined. The intensity was increased formerly in two weeks grounded on the variation of the exercises.

**Training programme**

The training programme was lasted for 60 minutes for session in a day, 3 days in a week for a period of 8 weeks duration. These 60 minutes included warm up for 10 minutes, 40 minutes plyometric circuit training and warm down for 10 minutes. The equivalent in high intensity interval training is the length of the time each action in total 3 day per weeks. (Monday, Wednesday and Friday).

The training programme was lasted for 60 minutes for session in a day, 3 days in a week for a period of 8 weeks duration. These 60 minutes included warm up for 10 minutes, 40 minutes aerobic circuit training and warm down for 10 minutes. The equivalent in high intensity interval training is the length of the time each action in total 3 day per weeks. (Monday, Wednesday and Friday)

**Statistical analysis**

The means and standard deviations of high intensity interval training groups were calculated for speed and breathe holding time for the pre as well as posttests. Statistical significance was set to a priority at  $p < 0.05$ . All statistical tests were calculated using the statistical package for the social science (SPSS).

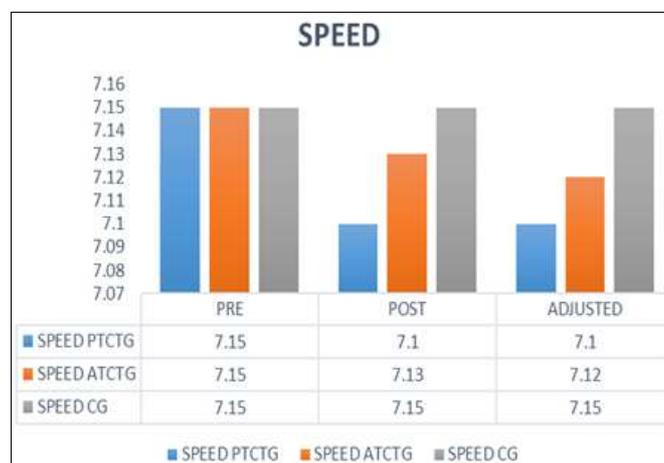
**Table 1:** Analysis of covariance on pre, post and adjusted post-test means on speed of experimental and control groups (Scores in Seconds)

Test	Plyometric circuit training group	Aerobic circuit training group	Control Group	Source of variance	DF	Sum of square	Mean square	F-ratio
Pre-test mean	7.15	7.15	7.15	B / S	2	0.20	0.10	0.07
				W / S	42	84.33	1.48	
Post-test mean	7.10	7.13	7.15	B / S	2	54.25	27.12	16.40*
				W / S	42	115.37	2.02	
Adjusted post-test mean	7.10	7.12	7.15	B / S	2	48.38	24.19	25.92*
				W / S	41	48.51	0.86	

\* Significant at 0.05 level for the degrees of freedom (2, 42) and (2, 41), 3.22

Table I reveals the computation of 'F' ratios on pretest, posttest and adjusted posttest means of PTCTG, ATCTG and CG on speed. The obtained 'F' ratio for the pretest means of PTCTG, ATCTG and CG on speed was 0.07. Since the 'F' value was less than the required table value of 3.22 for the degrees of freedom 2 and 42, it was found to be not significant at 0.05 level of confidence. Further, the posttest 'F' ratio 16.40 after PTCTG, ATCTG and CG on speed was

higher than the required table value of 3.22 for the degrees of freedom 2 and 42, hence it was found to be statistically significant at 0.05 level of confidence. The obtained 'F' ratio for the adjusted post-test means of PTCTG, ATCTG and CG on speed was 25.92. Since the 'F' value was higher than the required table value of 3.22 for the degrees of freedom 2 and 42, it was found to be statistically significant at 0.05 level of confidence.



**Fig 1:** Bar diagram showing the mean value on speed of college women kho-kho players on experimental group and control group

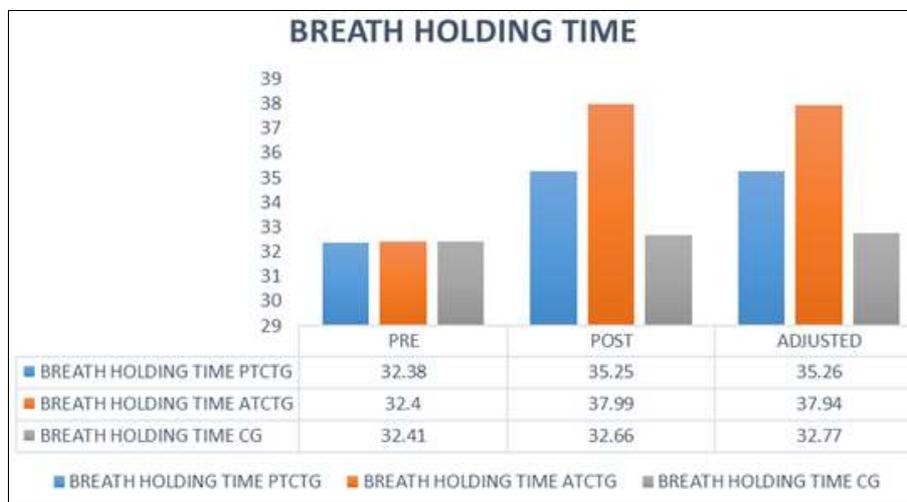
**Table 2:** Analysis of covariance on pre, post and adjusted post-test means on breath holding time of experimental and control groups (Scores in Seconds)

Test	Plyometric circuit training group	Aerobic circuit training group	Control Group	Source of variance	DF	Sum of square	Mean square	F-ratio
Pre-test mean	32.38	32.40	32.41	B / S	2	0.13	0.07	0.09
				W / S	42	40.65	0.71	
Post-test mean	35.25	37.99	32.66	B / S	2	6.25	3.12	9.94*
				W / S	42	45.13	0.79	
Adjusted post-test mean	35.26	37.94	32.77	B / S	2	4.76	2.38	11.29*
				W / S	41	16.09	0.28	

\*Significant at 0.05 level for the degrees of freedom (2, 42) and (2, 41), 3.22

Table 1 reveals the computation of 'F' ratios on pretest, posttest and adjusted posttest means of PTCTG, ATCTG and CG on breath holding time. The obtained 'F' ratio for the pretest means of PTCTG, ATCTG and CG on breath holding time was 0.09. Since the 'F' value was less than the required table value of 3.22 for the degrees of freedom 2 and 42, it was found to be not significant at 0.05 level of confidence. Further, the posttest 'F' ratio 9.94 after PTCTG, ATCTG and

CG on breath holding time was higher than the required table value of 3.22 for the degrees of freedom 2 and 42, hence it was found to be statistically significant at 0.05 level of confidence. The obtained 'F' ratio for the adjusted post-test means of PTCTG, ATCTG and CG on breath holding time was 11.29. Since the 'F' value was higher than the required table value of 3.22 for the degrees of freedom 2 and 42, it was found to be statistically significant at 0.05 level of confidence.



**Fig 2:** Bar diagram showing the mean value on breath holding time of college women Kho-Kho players on experimental group and control group

**4. Discussions on findings**

Circuit training is a programme of repeated handling with a set of plyometric and aerobic exercises after each run. The period between runs must be long enough to allow the athlete eventually to recover from former run, but not long enough to go him complete recovery (Ecker, 1992). The further work an athlete performs per unit of time, the advanced the intensity. The capability to run faster to chase and run to demonstrate lesser dexterity for successful touch with great delicacy are the chops demanded for successful play of kho- kho game at all situations and all periods. The positive result set up in the present study is related through in an empirical and private way to the kabaddi player adherence to the training programme. It's unusual design and diversified structure may have contributed to bettered performance and to maintain of high position performance. Further, we believe that such a programme greatly contributes to motor literacy with positive impacts on unborn motor actions.

Youthful people who are slender and nimble and having a good abidance are considered suitable for playing this exertion, and the observers get the exhilaration of seeing instigative sports to their satisfaction.

Aerobic capacity study that there was a significant difference between pre and post-test of agility, VO2 Max and thigh circumference of college level women Kabaddi players.

Thirulogachandar G (2019) [3] confirmed that the plyometric training is effective training on improving Agility, Sprint and Explosive power in semi-professional kabaddi players, Hence, we conclude that the Plyometric training (Group-A) is more effective in improving Agility, Sprint and Explosive power in semi-professional kabaddi players. The present study experimented the influence of eight weeks Plyometric and aerobic circuit training on the named variables are speed and breath holding time of the inter collegiate council women kabaddi players.

The results of this study indicated that plyometric circuit training and aerobic circuit training is more effective to bring out desirable changes over the speed and breath holding time of the inter collegiate council women kabaddi players.

The result from this study are veritably encouraging and it demonstrates the benefits of plyometric circuit training and aerobic circuit training either, the results support that enhancement in mobility can do 8 weeks of plyometric circuit training and aerobic circuit training.

**Conclusions**

From the results of the study and discussion the following conclusions were drawn. Women kabaddi players ended up falling in love with the plyometric circuit training and aerobic circuit training form rehearsed with a different shells during

play.

1. Grounded on the result of the study it was concluded that the 8 weeks of plyometric circuit training and aerobic circuit training have been significantly changes in speed and breath holding time of inter collegiate women kabaddi players.
2. It was concluded that the 8 weeks of plyometric circuit training bettered better of speed also aerobic circuit training of inter collegiate women kabaddi players.
3. It was concluded that the 8 weeks of aerobic circuit training bettered better of breath holding time also plyometric circuit training of inter collegiate women kabaddi players.
4. It's concluded that the high intensity interval training demanded to be incorporated in the training protocol to enhance the overall performance of platoon sports.

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