EFFECT OF INTERVAL TRAINING IN VARIED SURFACES ON AGILITY AND REACTION TIME AMONG KABADDI PLAYERS

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Abstract: The purpose of the study was to find out the effect of interval training in varied surfaces (Clay and Kabaddi floor mat) on agility and reaction time among kabaddi players. To achieve the purpose of this study, 30 male kabaddi players were randomly selected as participants from RVS group of Institutions, Tiruchirappalli, Tamilnadu, India. Their age ranged from 18 to 22 years. The selected participants were randomly divided into three groups such as Group 'I' underwent interval training in clay court (n=10), Group 'II' underwent interval training in Kabaddi floor mat (n=10) and Group 'III' acted as control group (n-10). Group 'I' and Group 'II' underwent interval training in their respective surfaces such as clay and Kabaddi floor mat for three alternative days and one session per day, and each session lasted about 45 minutes for twelve weeks of period. Group 'III' was not exposed to any specific training but they were participated in regular activities. The data on agility and reaction time were collected and administering by Illinois Agility and Reaction Timer Tests. The pre and post tests data were collected on selected criterion variables prior to and immediately after the training programmes. The pre and post tests scores were statistically examined by the dependent't' test, Analysis of co-variance (ANCOVA), Whenever the 'F' ratio for adjusted post-test means was found to be significant, Scheffe's post hoc test was followed to determine which of the paired means difference was significant. In all the cases 0.05 level of confidence was fixed as a level of significant. It was concluded that the interval training in clay court and interval training in Kabaddi floor mat groups had shown significantly improved in agility and reaction time. However the control group had not shown any significant improvement on any of the selected variables such as agility and reaction time.

Keywords: Interval Training, Clay Court, Kabaddi Floor Mat, Agility, Reaction Time.

I. Introduction

Training is not a recent discovery. In ancient times, people systematically trained for military and Olympic endeavors. Today athletes prepare themselves for a goal through training. Training represents a long-term endeavour. Athletes are not developed overnight and a coach cannot create miracles by cutting corners through overlooking scientific and methodical theories [1].

Interval training was first described by "Reindell & Roskamm" and was popularized in the 1950s by the Olympic champion, Emil Zatopek. Interval training is that it is a type of training which includes alternate periods of exercise and recovery; it is 'intermittent training [2]. Scientific research has said some light on the choice of intensity; work duration and rest periods are called 'interval training'. Interval training involves repeated short to long bouts of rather high intensity exercise (equal or superior to maximal lactate steady-state velocity) interspersed with recovery periods (light exercise or rest) [3]. Interval training is a method of training where a person increases and decreases the intensity of his workout between aerobic and anaerobic training. Interval training works both in the aerobic and the anaerobic system. During the high intensity effort, the anaerobic system uses the energy stored in the muscles (glycogen) for short bursts of activity. Anaerobic metabolism works without oxygen [4]. Consequently, we can suppose that the fatigue effects could be more important on Clay court because this court surface may cause longer rallies, intense and prolonged matches, and lower effective resting time. The player's running movement performance on Clay could be hindered because of fatigue [5]. Differences in match-play activity related to different court surfaces have also been reported to have an impact on match play physiological and metabolic responses [6]. How well the player performs during professional tournaments is related to the surface on which the matches are played. Slower surfaces such as clay courts allow players to run around to hit a shot, which usually implies more power and precision when hitting the ball but also increases the distance to be covered to return to a central position. Court speed is determined primarily by the friction between the players and the court surface (coefficient of friction) [7].

Kabaddi is an outdoor and indoor sport; when it's played an outdoor used the surface as on clay and an indoor used on Kabaddi floor mat [8]. The clay is the surface fires up stability muscles that may not be used very often and is great for barefoot running. But sand can be uneven and unstable and puts extra pressure on knees, Achilles tendons, calves, ankles and hips. It's best to start gradually with low miles and slowly work up to longer distances as your body tolerates it [9]. Kabaddi floor mat is a soft and sturdy surface which has a bit of bounce making it easy on muscles and joints. It can be an ideal surface for someone who is

slowly building back after an injury and a great place to do speed work. However the continual turns on a track can be hard for people who deal with calf issues. It can get a bit boring if trying to log multiple miles [10].

Agility is the ability of a person to change direction or body position quickly and regain poise or control to proceed with other movement [11]. Agility is the physical ability that enables a person rapidly to change body position and direction in a precise manner [12]. Reaction time is the interval of time between the presentation of stimulus and the initiation of the response [13].

II. PURPOSE OF THE STUDY

The purpose of the study was to find out the effect of interval training in varied surfaces (Clay and Kabaddi Floor mat) on agility and reaction time among kabaddi players.

III. METHODOLOGY

To achieve the purpose of this study, 30 male kabaddi players were randomly selected as subjects from RVS group of Institutions, Tiruchirappalli, Tamilnadu, India. Their age ranged from 18 to 22 years. The researcher reviewed the available scientific journals, periodical, magazine, e-resources and research paper. Taking into consideration feasibility criteria, availability of the instrument and relevance of the variable of the present study the following dependent variables namely agility and reaction time were selected. Similarly interval training in varied surface was chosen as independent variable. The agility and reaction time were assessed by Illinois Agility and Reaction Timer Tests respectively. This study was conducted to determine the possibility cause and effect of interval training on agility and reaction time among kabaddi players. The subjects were divided into three equal group consists of 10 each. Experimental Group 'I' underwent interval training in clay court (n=10), Experimental Group 'II' underwent interval training in Kabaddi floor mat (n=10) and Group III (n=10) acted as control group. The control group was not given any treatment and the experimental groups were given interval training for three alternative days per week, for a period of twelve weeks. The collected data from the three groups prior to and after the experimental treatment and it was statistically analyzed by using the statistical technique of dependent 't' test and analysis of covariance (ANCOVA). Whenever the 'F' ratio for adjusted post-test means was found to be significant, Scheffe's post hoc test was followed to determine which of the paired means difference was significant. In all the cases 0.05 level of confidence was fixed as a level of significant.

3.1 Result and Findings

The effect of interval training in varied surfaces on agility and reaction time were analyzed and presented below.

3.1.1Agility

Table 3.1.1: Computation of 't' - ratio between pre and post test means of both interval training and control groups on agility (In seconds)

Tests		Pre Test	Post Test	't' – Value
Experimental Group I	Mean	21.58	20.62	7.10*
	SD	0.64	0.60	
Experimental Group II	Mean	21.74	19.85	9.86*
	SD	0.63	0.52	
Control Group	Mean	22.35	21.97	0.12
	SD	0.67	0.76	

*****Significant at 0.05 level. (Table value required for significance at .05 level for 't'-test with df 9 is 2.26)

The table 3.1.1 shows that the pre-test mean value of both experimental and control groups are 21.58, 21.74 and 22.35 respectively and the post test means are 20.62, 19.85 and 21.97 respectively. The obtained dependent t-ratio values between the pre and post test means of both experimental and control groups are 7.10, 9.86 and 0.12 respectively. The table value required for significant difference with df 9 at 0.05 level is 2.26. Since, the obtained 't' value value of both experimental groups are greater than the table value, it was understood that both experimental groups had significantly improved on agility. However, the control group had not improved significantly. The 'obtained 't' value is less than the table value, as they were not attended to any specific training.

The analysis of covariance on agility of both experimental groups and control group have been analyzed and presented in table 3.1.2.

Table 3.1.2: Analysis of covariance on agility of both interval training and control groups

Adjusted Post Test Means			Source of Variance	Sum of Square	df	Means Square	F-ratio
Experimental Group I	Experimental Group II	Control Group					
20.59	19.83	21.97	Between	26.08	2	13.04	42.06*
			Within	8.06	26	0.31	

* Significant at 0.05 level. Table value for df 2, 26 was 3.37.

Table 3.1.2 shows that the adjusted post test means of both experimental and control groups are 20.59, 19.83 and 21.97 respectively. The obtained F-ratio value is 42.06 which was greater than the table value 3.37 with df 2 and 26 required for significance at 0.05 level. Since the value of F-ratio is greater than the table value, it indicates that there is a significant difference among the adjusted post-test means of both experimental and control groups.

Since the obtained 'F' ratio value was significant further to find out the paired mean difference, the Scheffe's post hoc test was employed and presented in table 3.1.3.

Table 3.1.3: The scheffe's post hoc test for the difference between paired means on agility

Experimental Group I	Experimental Group II	Control Group	MD	CI
20.59	-	21.97	1.38*	0.65
20.59	19.83	-	0.76*	
-	19.83	21.97	2.14*	

*Significant at 0.05 level of confidence.

The table 3.1.3 shows that the mean difference values between experimental group I & control group, experimental group I & experimental group II and experimental group II & control group are 1.38, 0.76 and 2.14 respectively which are greater than the confidence interval value 0.65 at 0.05 level of confidence. The results of the study showed that there were a significant difference between experimental group I & control group, experimental group I & experimental group II and then experimental group II & control group on agility.

The pre, post and adjusted post- test means values of experimental group I, experimental group II and control group on agility graphically represented in the figure 3.1.

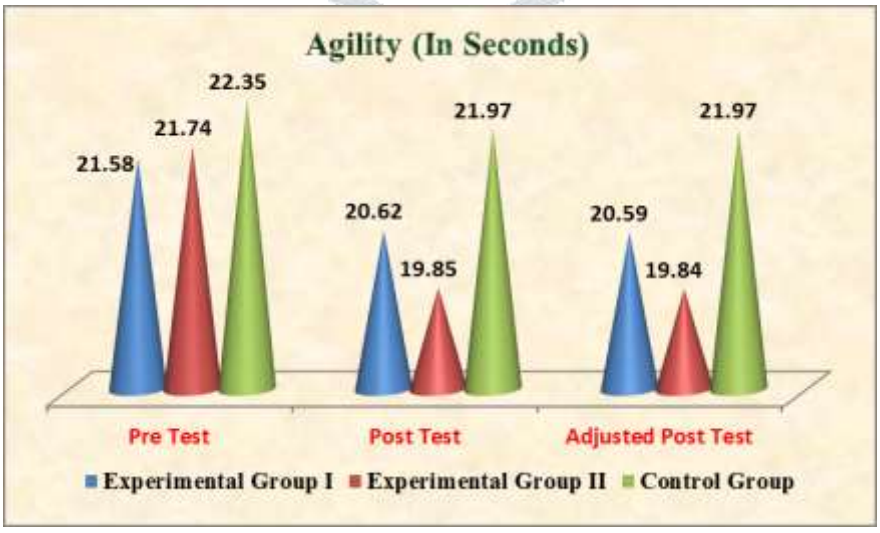

Fig 3.1: pre, post and adjusted post tests mean values of both interval training and control groups on agility

3.2.1 Reaction Time

Table 3.2.1: Computation of 't' - ratio between pre and post test means of both interval training and control groups on reaction time (in seconds)

Tests		Pre Test	Post Test	't' – Value
Experimental Group I	Mean	0.18	0.15	11.84*
	SD	0.01	0.01	
Experimental Group II	Mean	0.18	0.14	15.67*
	SD	0.03	0.01	
Control Group	Mean	0.18	0.17	0.73
	SD	0.02	0.02	

*****Significant at 0.05 level. (Table value required for significance at .05 level for 't'-test with df 9 is 2.26)

The table 3.2.1 shows that the pre-test mean value of both experimental and control groups are 0.18, 0.18 and 0.18 respectively and the post test means were 0.15, 0.14 and 0.17 respectively. The obtained dependent t-ratio values between the pre and post test means of both experimental and control groups are 11.84, 15.67 and 0.73 respectively. The table value required for significant difference with df 9 at 0.05 level is 2.26. Since, the obtained 't' ratio value of both experimental groups are greater than the table value, it was understood that both experimental groups had significantly improved on reaction time. However, the control group had not improved significantly. The obtained 't' value is less than the table value, as they were not attended to any of the specific training.

The analysis of covariance on reaction time of both experimental and control groups have been analysed and presented in table 3.2.2.

Table 3.2.2: Analysis of covariance on reaction time of both interval training and control groups

Adjusted Post Test Means			Source of Variance	Sum of Square	df	Means Square	F-ratio
Experimental Group I	Experimental Group II	Control Group					
0.15	0.13	0.17	Between	0.004	2	0.002	20.00*
			Within	0.003	26	0.0001	

* Significant at 0.05 level. Table value for df 2, 26 was 3.37.

Table 3.2.2 shows that the adjusted post test means of both experimental and control groups are 0.15, 0.13 and 0.17 respectively. The obtained F-ratio value is 20.00 which were greater than the table value 3.37 with df 2 and 26 required for significance at 0.05 level. Since the value of F-ratio is greater than the table value, it indicates that there is a significant difference among the adjusted post-test means of both experimental and control groups.

Since the obtained 'F' ratio value was significant further to find out the paired mean difference, the Scheffe's post hoc test was employed and presented in table 3.2.3.

Table 3.2.3: The scheffe's post hoc test for the difference between paired means on reaction time

Experimental Group I	Experimental Group II	Control group	MD	CI
0.15	0.13	-	0.02*	0.01
0.15	-	0.17	0.02*	
-	0.14	0.17	0.03*	

*Significant at 0.05 level of confidence.

The table 3.2.3 shows that the mean difference values between experimental group I & control group, experimental group I & experimental group II and experimental group II & control group are 0.02, 0.02 and 0.03 respectively which are greater than the

confidence interval value 0.01 at 0.05 level of confidence. The results of the study showed that there were a significant difference between experimental group I & control group, experimental group I & experimental group II and then experimental group II & control group on reaction time.

The pre, post and adjusted post- test means values of experimental group I, experimental group II and control group on reaction time graphically represented in the figure 3.2.

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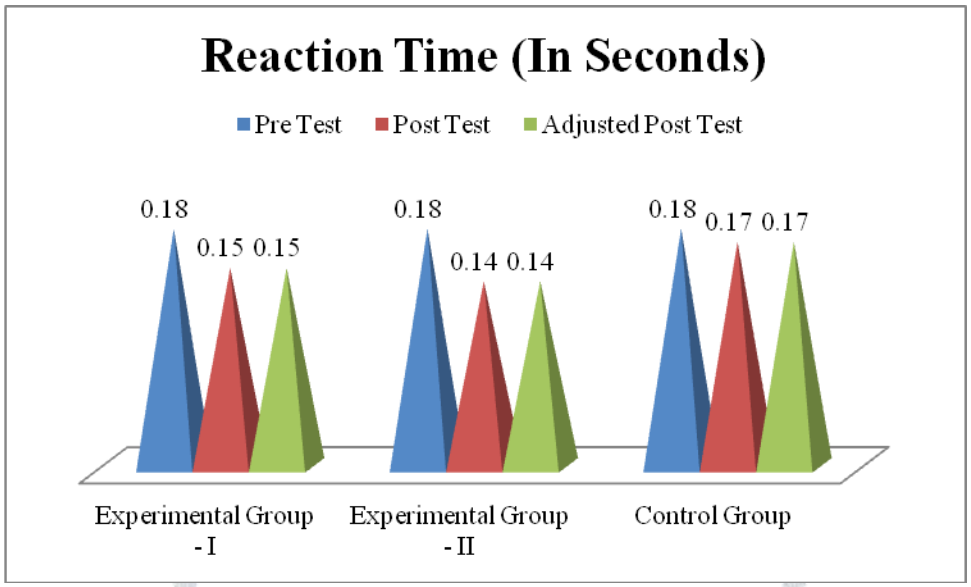

Fig 3.2: pre, post and adjusted post tests mean values of both interval training and control groups on reaction time.

IV. DISCUSSION ON FINDINGS

Choi, Sum, & Leung, (2015) investigated the difference in agility performance with natural turf (NT) and artificial turf (AT) surface in rugby union players on the repeated sprint, cut and turn movements and if any differences exist between holding the ball or not in relation to agility performance. The findings also indicated that running with the ball for 40 meters would not slow the players down as there was a counter effect on the ground surface and ball carrying, while the turning movement was affected by both effects. Harrison, Jensen, & McCabe, (2004) examined the technical adaptations used by elite sprinters when running on sand dunes compared with running on a grass surface of similar gradient. The results indicated that sand running caused reductions in running speed, stride rate, stride length and thigh range of motion. Ground contact time of the foot was increased and the relative timing of stride events was also disrupted while running on sand and this suggests a greater muscle loading effect compared with running on grass. Yuwraj & Jai (2014) conducted to find out the impact of playing surface clay & met motor coordinative ability of male state Kabaddi players, to conduct the study, 80 male kabaddi players age group 18-25 years. Results indicate the shuttle run performance of male kabaddi on clay surface was significantly better as compared to mat surface at .01 level of statistical significance. It was concluded that playing surface effect motor coordinative ability of male Kabaddi players. The result of the my study indicates that there was a significant improvement on agility and reaction time due to the effect of interval training in varied surfaces on agility and reaction time among kabaddi players when compared to control group take with support of above said studies.

V. CONCLUSIONS

From the result of the study the following conclusions were drawn,

1. The interval training on clay court group and interval training on Kabaddi floor mat group had significantly improved on agility and reaction time among kabaddi players.
2. The control group kabaddi players had not shown significant changes on agility and reaction time.

VI. REFERENCE

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