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Mallakhamb and tai chi training on selected physical fitness variables among men intercollegiate kabaddi players

Dr. D Natarajan**Abstract**

Objective: The purpose of study was to investigate the effect of Mallakhamb [MBT] and Tai Chi [TCT] training on muscular strength and flexibility among intercollegiate kabaddi players.

Methods: Ninety intercollegiate kabaddi players were grouped according to three groups, namely group I MBT (n=30), group II TCT (n=30), group III G_{CON} (n=30) did not involve in any strenuous physical activity during the course of study and age ranged from 18 to 25 years. The main focus of study was muscular strength and flexibility which were measured by leg dynamometer and sit and reach test respectively. The study was formulated as a random group design. The subjects were tested at the beginning pretest and at the end of the experimental period post-test were taken after a 12 weeks. Analysis of Covariance (ANCOVA) was used to test significance. Wherever a significant difference is found in Scheffe's post Hoc test was used.

Results: Significant improvements ($P < 0.05$) following MBT and TCT were found in: muscular strength and flexibility as compared to control group. Further the MBT grater improvement that the TCT.

Conclusion: Present findings suggest that MBT and TCT implementing specific training program focused on muscular strength and flexibility in intercollegiate Kabaddi players.

Keywords: Mallakhamb [MBT], Tai Chi [TCT], muscular strength and flexibility

1. Introduction

Improving the stages of physical fitness for the competition is the main goal of any training program for athletes. Athletes often had to peak for competitions several times over a yearly training [1]. In this view, specificity was a key element for designing any preparation schedule [2]. In direct, to improve a particular section of physical fitness; an individual could highlight that component in exercise. A training program could pressure the physiological systems used to execute a particular activity in order to achieve specific training connected adaptations [3]. Kabaddi is a team game, which requires ability, strength and power and combines the kind of wrestling and rugby. It was initially meant to develop a self-defense, in addition to responses to attack and reflexes of counter attack by persons, and by groups or teams. It is rather simple and inexpensive game, and neither requires an enormous playing area, nor any expensive kit [4]. The Mallakhamb exercise is one of the physical activities which is performed by poses and feats while hanging from a wooden pole [5]. The word mallakhamb comprised of mallakhamb - mallar khambam - malla- mallar denotes – man of strength (power) – soldiers – gymnast. Khamb means wooden pole or translated as a wrestler's pillar [6]. It was a very common form of exercise wrestlers and kabaddi. They are three type's pole mallakhamb, hanging mallakhamb and rope mallakhamb. Mallakhamb training is a preparatory skill in wrestling [7]. The wrestler's pillar gives many advantages to a wrestler to developed whole body strength and also arm pit moved on wrestlers pillar ensures long throws fast and round moves thereon enables the wrestler to easily escape from the hard locks and holds of his opponent [8]. In Wrestler's pillar, 13 groups' feats are formed; they are front leg grips, jumps, salutations, back leg grips, repetition grips, descending, turnings, balance, creeping, needle thread moves, yoga postures and exhibition feats [9]. Tai Chi is a callisthenic exercise form, originating from China [10]. It is a moderate aerobic workout [11, 12], which provides the benefits of flexibility and muscle strengthening [13].

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There are various form of Tai Chi, namely Yang, Sun, Chen, and Wu [14]. Tai Chi is becoming develop popular universal, given is many health benefits [10, 15]. It has been developed for mind, body interaction, breathing regulation with body movement, hand-eye coordination, and tranquilization [16]. Additional benefits of Tai Chi increases aerobic capacity [17] enhance balance [18] reduce anxiety [19] and stress [20]. One of the actual reward of TC is that is a easy, convenient workplace intervention that may promote musculoskeletal health, does not need any special equipment [21, 22], is an inexpensive form of work out [23], and is appropriate for all ages [24].

Accordingly, the purpose of this study was to effects of 12 weeks of MBT and TCT on selected physical fitness variables among intercollegiate Kabaddi players. The hypothesized that MBT and TCT significant improvement on muscular strength and flexibility compared to G_{CON}. Further that MBT significantly better in improving the muscular strength and flexibility that the TCT.

2. Material and Methods

2.1 Subjects

90 intercollegiate Kabaddi players (age: 18 to 25 years) volunteered to participate in this study, the participants provided written informed consent to the experimental procedures. All subjects were randomly assigned to three equal groups one group was G_{CON} others matched to MBT and TCT programs. The study was performed in accordance with the declaration (2014) and was approved by the Tamil Nadu Physical Education and Sports University, ethics committee and met the ethical standards in sports and exercise science research.

2.2 Experimental protocol and procedures

Following the testing subjects were matched into three separate equal training groups (n=30). All the subjects underwent a 12 weeks MBT and TCT program. The MBT and TCT groups (G1 and G2) performed morning and evening MBT and TCT session including technique drills and tactic practice 6 days a week for 12 weeks (120 min). Control Subjects (G_{CON}) to avoid strenuous exercise. The players began daily practices both in the morning and evening sessions with a 20 minutes warm-up that included running 15 minutes and was followed by stretching exercise. After warm-up, actual practice for MBT and TCT took 80 minutes. Twenty minutes cooling down exercise followed after both training programs. In the afternoon all players take a complete rest.

2.3 Training session

2.3.1 Mallakhamb training program (MBT) Morning and Evening practices

- 20 minutes warm-up;
- 10 set of work, 5 minutes rest between the set;
- Movements including Salami, Sadhi udi, Bagal udi, Khanda udi, Sadhi tedi, Sadhi udi dashrang, Bagal udi dashrang, Potacha tajva, Bajrang, Bajrang catch, Sudira both the side, Short arm balance, Abdominal balance, Straddle, Koormasana, One hand mayurasan, Veerapathrasan, Simple dismount, Shoulder grip dismount. A qualified Mallakhamb instructor conducted the MB training program.
- 20 minutes cooling down exercise.

2.3.2 Tai Chi training program (TCT) Morning and Evening practices

- 20minutes warm-up;
- Tai Chi 24 form exercise program the sequence of movements from (1) to (24) was repeated 10 set.
- The main steps are preparation posture, starting posture, mustang paring its mane, white crane spreading its wings, holding the knee in bending step, Swinging pipa, Upper arm rolling, Pulling peacock’s tail (left and right), Single whip, Cloud hand, Reigning the horse, Raising the right foot, Twin peaks, Turning the body and raising the left foot, Standing on one foot and extending left leg and right foot, Shutting baue and front, Needle at the bottom of the sea, Swinging the back, Turning body, Pulling, Blocking and pounding, Stopping blows, Crossed hands, Finishing posture. A qualified Tai Chi instructor conducted the TC training program.
- 20 minutes cooling down exercise.

2.4 Measurement of Physical fitness

Muscular strength and flexibility was measured in leg dynamometer and sit and reached test.

2.5 Statistical analyses

Differences between groups were analyzed using Analysis of Covariance (ANCOVA) followed by Scheffe’s post hoc test when a significant F ratio was observed. The alpha level for statistical significance was set at P≤0.05.

3. Results

3.1. Muscular Strength

Table 1: Twelve weeks of mallakhamb and tai chi training groups (MBT, TCT) and the control group (G_{CON}) for pre and post-tests data on muscular strength (Scores in Kg.).

Test	Means			SV	SS	DF	MS	‘F’
	MBT	TCT	G _{CON}					
Pre-Test	121.17	122.77	124.97	B	218.40	2	109.20	1.08
				W	8798.50	87	101.13	
Post-Test	135.27	134.90	125.33	B	1903.27	2	951.63	7.23*
				W	11451.23	87	131.62	
Adjusted Post Test	137.13	135.11	123.27	B	3289.82	2	1644.91	69.04*
				W	2049.12	86	23.83	

P=0.05 level of confidence with degrees of freedom 2, 87 and 2, 86 is 3.10. MBT: mallakhamb training; TCT: tai chi training; G_{CON}: control group; B: between; W: within; SV: source of variance; SS: sum of squares; MS: means square.

With regard to the sample characteristics and the muscular strength at the baseline data, Table-1 shows that F (2, 87) =1.08, P>0.05 was not significant. Howler after the 12 weeks training period, significant increased F (2, 87) =7.23, P<0.05 and adjusted post-test mean F (2, 86) =69.04, P<0.05.

Significant difference among the groups. Table -2 shows post hoc comparisons using the Scheffe’s test indicated that the mean difference for groups MBT- G_{CON}=13.86, TCT- G_{CON} =11.84 significant P<0.05 and MBT-TCT =2.02 not significant P>0.05 (See Fig-1).

Table 2 The Scheffe’s Confidence interval test scores on muscular strength

MBT	TCT	G _{CON}	MD	CI
137.13	135.11	-	2.02	3.14
137.13	-	123.27	13.86*	3.14
-	135.11	123.27	11.84*	3.14

*Significant, MBT: mallakhamb training; TCT: tai chi training; G_{CON}: control group; MD: mean difference; CI: class interval.

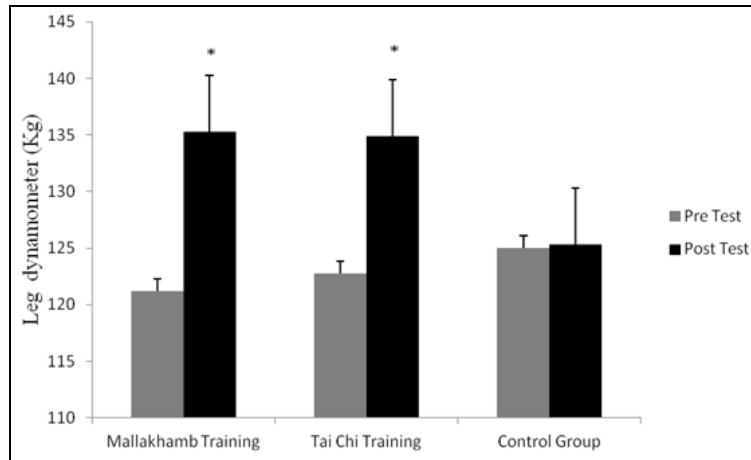


Fig 1: Means of leg dynamometer test between MBT, TCT and G_{CON}. *Significantly greater than pre training values ($P < 0.05$).

3.2. Results on Flexibility

Table 3: Twelve weeks of mallakhamb and tai chi training groups (MBT, TCT) and the control group (G_{CON}) for pre and post-tests data on flexibility (Scores in cm.)

Test	Means			SV	SS	DF	MS	‘F’
	MBT	TCT	G _{CON}					
Pre-Test	21.23	21.73	20.97	B	9.09	2	4.54	1.32
				W	300.20	87	3.45	
Post Test	25.83	25.70	21.47	B	370.07	2	185.03	65.46*
				W	245.93	87	2.83	
Adjusted Post Test	25.89	25.38	21.72	B	305.91	2	152.96	167.69*
				W	78.44	86	0.91	

$P = 0.05$ level of confidence with degrees of freedom 2, 87 and 2, 86 is 3.10. MBT: mallakhamb training; TCT: tai chi training; G_{CON}: control group; B: between; W: within; SV: source of variance; SS: sum of squares; MS: means square.

The results of muscular strength described in Table 3 shows that $F(2, 87) = 1.32, P > 0.05$ was not significant. However after the 12 weeks training period, significant increased $F(2, 87) = 64.46, P < 0.05$ and adjusted post-test mean $F(2, 86) = 167.69, P < 0.05$. Significant difference among the groups Table -4 shows post hoc comparisons using the Scheffe’s test indicated that the mean difference for groups MBT-G_{CON} = 4.17, TCT- G_{CON} = 3.66 significant $P < 0.05$ and MBT-TCT = 0.51 not significant $P > 0.05$ (See Fig-2).

Table 4: The Scheffe’s Confidence interval test scores on flexibility

MBT	TCT	G _{CON}	MD	CI
25.89	25.38		0.51	0.61
25.89		21.72	4.17*	0.61
	25.38	21.72	3.66*	0.61

*Significant, MBT: mallakhamb training; TCT: tai chi training; G_{CON}: control group; MD: mean difference; CI: class interval.

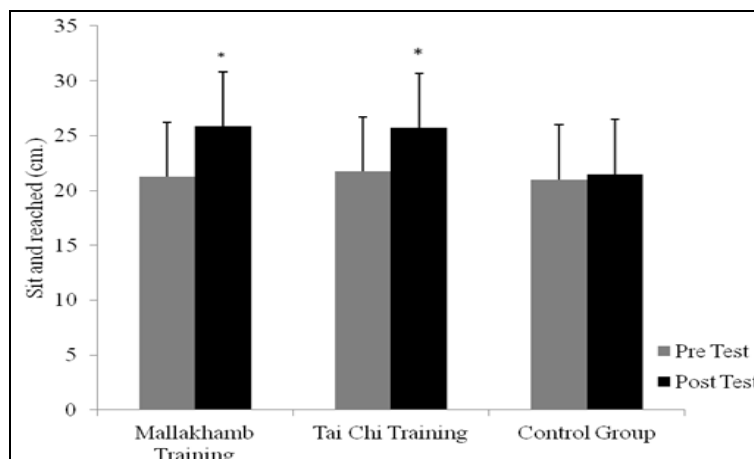


Fig 2: Means of sit and reached test between MBT, TCT and G_{CON}. *Significantly greater than pre training values ($P < 0.05$).

4. Discussion

In this report we examined the effects of MBT and TCT programs in Kabaddi players and suggested a specific practical training protocol for this sport.

Based on the findings of the present analysis were as follow:

Both experimental groups have significantly increased the muscular strength and flexibility as compared to control group. Further, the physical fitness variable was significantly higher due to MBT than TCT.

4.1 Muscular strength

The 12 week of MB and TC training program on muscular strength and flexibility between intercollegiate kabaddi players. The main reason for this being the finding that MB and TC training can increase physical fitness level, especially MB training improved of muscular strength among college men [25]. Ganesh. K (2010) [26] suggested that MB training led to significant improvements in muscular strength and flexibility among juvenile boys. Furthermore, Kelly JM *et al.* (1978) [27] suggested that collegiate wrestlers during the course of a season increase muscular strength. Douda *et al.* (2007) [28] suggested that 6 month of rhythmic gymnastics improving muscular strength. In relation to this study, 12 weeks MB training given and found improvement in muscular strength. The result of present study also indicates that MB participants outperformed their counterparts in the control group on the muscular strength. Such a finding provides Deley G (2011) [29] six weeks gymnastic training program improving the muscular strength.

4.2 Flexibility

The results shows that the MB and TC training had a significant effect on improving flexibility, further more MB training was better improving in flexibility than the TC training. This finding supports those of previous studies that indicate that MB and Silambam training improves flexibility [30]. These findings also support previous studies that indicate 8 weeks of MB and Yoga training improved the flexibility among Kabaddi players [31]. Further the findings are 9 month of gymnastics training improved in flexibility there are numbers reports that provide reasonable support to the MB and Gymnastic players significantly improved the flexibility [32]. MB performance of state level performers to increased the flexibility. These results supported our hypothesis [33]. Kagathara. C.B (2012) [34] suggested that 10 weeks of MB training improving the AAPERD physical fitness and flexibility superior than the male students. Other authors also stated that 12 weeks of physical training improved flexibility in state MB performers [35]. Ambethkar. K (2013) [36] suggested that 12 weeks physical training and yogasanas training improving flexibility among state MB performers. In addition, another studies reported in 8 weeks of MB exercises increased muscular strength and flexibility among Javelin throwers [37].

The evidence from this study therefore suggests that a MBT and TCT programmes to support to develop physical fitness for kabaddi players. Finally, this is an exploratory study and our analysis of the results also suggest that a brief training camp, which the MBT and TCT program is carried out other parameters and also MBT and TCT may be implemented as supplementation training for players in addition to this regular activity. Coaches and athletes should be aware of these findings in order to develop and maintain physical fitness sufficient for a successful technical performance. Further research are needed whether similar necessary to explore the

effects of MBT and TCT programme for gymnastics, wrestling, swimming and judo may be conducted. Such studies may be undertaken analyse to different age group.

5. Conclusion

The present examination shows that 12 weeks of MBT and TCT significantly improvement on muscular strength and flexibility among men intercollegiate kabaddi players. The findings of this study supported our research hypothesis, with statistically significant improvement in all of measured muscular strength and flexibility. The mallakhamb and tai chi training protocols could be considered as specific training programmes for improving selected physical fitness in well-trained kabaddi players under the conditions prevailed.

6. Disclosure of interest

The author declared that there was no competing interest in the area of study till now.

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