Impact Factor (SJIF): 6.092 **E-ISSN: 2583-1615**

International Journal of Research in Academic World

Received: 20/March/2023 **IJRAW:** 2023; 2(4):93-96 **Accepted:** 26/April/2023

The Effect of Proprioceptive Training, Yoga Asana Program and Combined Training on Dynamic Balance among Kho-Kho Players

[*1]Manoj Kumar N and [2]Dr. S Glady Kirubakar

[*1]Director of Physical Education, Government First Grade College, Tumkur, Karnataka, India.

[2]Assistant Professor, YMCA College of Physical Education, Chennai, Tamil Nadu, India.

Abstract

The purpose of the study was to find out the influence of proprioceptive training, yoga training and combined training programme on physical variable dynamic balance among school level kho-kho players. To achieve the purpose of the study sixty (N=60) male kho-kho players were randomly selected. The age group of the subject was 14 to 17 years. Selected subjects were equally divided into four groups namely one control and three experimental group. Control group was not given any type of training. Experimental group was given proprioceptive training, yoga training and combined proprioceptive and yoga training for a period of ten weeks. The pre-test and post-test data on dynamic balance was collected on both the groups before and after the experimental training collected data was analysed by using ANCOVA to find significant difference among mean at 0.05 level of confidence. It was concluded that experimental group combined proprioceptive and yoga training group significantly ($p \leq 0.05$) improved the dynamic balance when compared to control group of the school level kho-kho players.

Keywords: Proprioceptive training, yoga training, combined training and kho-kho players

Introduction

The Indian game of tag, Kho Kho, which originated in the state of Maharashtra (Marathi kh-kh); it is a team sport in which contact with opponents is avoided. Originally called Rathera because it was played on Indian chariots (raths), the game has evolved into a version of tag, a modified form of 'run-and-chase' in which the goal is to chase/pursue and touch the opponent. Despite being a team sport, Kho Kho requires stamina, endurance, strength, and agility, as well as the skills of dodging, feinting, and bursts of speed, because the game is powerful and aggressive in nature. Running, skipping, and weightlifting are the training methods used to maintain the endurance and strength necessary for the sport; the game is complex and tactical, and those with a mesomorphic somatotype, good muscle development, and better anaerobic and aerobic fitness perform well when compared to team sports. The game has gained popularity since it doesn't demand expensive gear (only wooden posts, string, measuring tape, and a stopwatch) while still building strength, stamina, and agility, which is tested during the game's time frame (20-35 minutes). In fact, when compared to Kabaddi players (a further indigenous game), the physical fitness variables of agility, speed, power, and endurance, as well as the only coordinative ability variable of rhythmic ability, have been reported to be significantly better in kho-kho.

A proprioceptive exercise program's goal is to train the afferent pathways to improve sense of movement and ensure that complex movements are performed correctly without hesitation or thought. Afferent and efferent stimuli provide proprioception, a complex part of the neuromuscular system that allows body balance and orientation to be maintained. These stimuli are transported and interpreted by the central nervous system, allowing for the formation and maintenance of proprioception during athletic activities.

Yoga exercises, which gained popularity by spreading throughout ancient India, are now being used as assistive exercises in sports teams. Yoga, which physically affects flexibility and balance as well as positive mental changes, is thought to have a positive effect on improving physical performance when practised on a regular basis. In yoga, we mostly practise static balances. They aid in the development of the muscular strength and mental focus required for all types of balance. In our daily lives, however, we are dynamically balancing as long as we are in motion. To do this well, the body and brain must be able to manage and adjust to constant shifts in balance. The skills we learn in static balance are very useful in dynamic balance, but they are not dynamic balance. As a result, when we perform, we should concentrate on the transitions between poses so that we can work on dynamic balance.

Keeping your movement mindful, try repeating your entrance and exit from poses several times to increase dynamic balance. Keep an eye on your alignment. Try balancing on

***Corresponding Author:** Manoj Kumar N

one foot and moving your arms or legs around it to develop dynamic balance while maintaining a steady base.

Objectives

The main objective of the study is to find out the efficacy of a specific proprioceptive training, yoga training and combined proprioceptive and yoga training on selected neuromuscular variables dynamic balance among kho-kho players.

Method

To achieve the purpose of the study 60 kho-kho players were selected. Selected subjects were equally divided into four group namely experimental group I proprioceptive training group (PTG) (n = 15), experimental group II yoga training group (YTG) (n = 15), experimental group III combined proprioceptive and yoga training group (PYTG) (n = 15) and a control group (CG) (n = 15). The control group performed only the kho-kho game practice during the study. Experimental group was given proprioceptive training, yoga training and combined proprioceptive and yoga training. The training programme included warm up (10 mins), work out (40 minutes) and cool down (10 mins) sessions for a duration of 40 min in three days of a week in the morning followed by warm up and end with proper warm down for ten weeks where muscles involved lower extremities. Other three days' experimental group practiced kho-kho. The data were analysed by ANOVA to determine the difference between initial and final mean for experimental and control group at 0.05 `level of significance. The formula was applied at 95% Confidence Interval and significant p values set at 0.05. The results were taken to be significant at $p \leq 0.05$.

Training Schedule

Table 1: Training Schedule

Experimental Training Group	Name of the Exercise	Week	1-3	4-6	7-10
		Sets	2	2	2
Proprioceptive Training (PTG)	1. Single leg stance while swinging the raised leg (flexed knee) 2. Forward & Backward leg swing with knee extended on single leg stance. 3. Cross leg swings 4. Single foot side to side ankle hop 5. Side to Side ankle hop 6. Runners Pose 7. Partial Squats 8. High Bench Step ups 9. Split squat jump 10. Double leg Stance on wobble board (Eyes open)	Reps.	12	15	18
		Sets	4	4	2
Yoga Training (YTG)	1. Vrikshasana 2. Vajrasana 3. Tadasana 4. Paschimouthanasana 5. Halasana 6. Bhujangasana 7. Dhanurasana 8. Naukasana 9. Sarwangasana 10. Bhunaman Vajrasana	Pose duration	30	60	90
Combined Proprioceptive &Yoga Training (PYCG)	(Monday, Wednesday & Friday) in a week for first five (05) weeks for proprioceptive training along with Group-I (PTG). (Tuesday, Thursday & Saturday) in a week for next five (05) weeks for yoga training along with Group-II (YTG).				

Pre-test and post test data was collected on control group and experimental group before and after the ten weeks of experimental training by using following authenticated tests, Dynamic balance-Modified bass test (Johnson & Leach. 1968) [4]

Analysis

Table II showing the analysis of covariance on dynamic balance,

Table 2: Analysis of covariance on dynamic balance of control and experimental group

Group		PTG	YTG	PYTG	CG	SoV	SS	Df	MS	F ratio
Pre Test	Mean	86.13	85.73	85.27	85.40	BG	6.733	3	2.244	0.146
	SD	4.23	3.74	4.10	4.87	WG	861.20	76	15.379	
Post Test	Mean	91.53	90.87	97.20	83.87	BG	1343.33	3	447.78	34.00*
	SD	4.72	2.48	4.99	3.44	WG	737.60	76	13.17	
Adjusted Post Test Mean		91.18	90.80	97.46	84.03	BG	1354.02	3	451.340	79.20*
						WG	313.43	75	5.70	
Mean Gains		5.40	5.14	11.93	1.53					

*Significant at 0.05 level 3 and 76 (df) =2.73, 3 and 75 (df) =2.73

The attained F-ratio for the adjusted post-test means of 79.20 was greater than the table F-ratio value of 2.73. Hence, the adjusted post-test means F-ratio was significant at 0.05 level of confidence for the degrees of freedom 3 and 75. This evidenced that there was a significant difference among the means due to the experimental trainings on dynamic balance. There were significant differences recorded in the test results. Hence, the data was exposed Scheffe's post hoc test for post hoc analysis. The results are given in the Table III.

Table 3: The Scheffe's Test for the Differences between the Adjusted Post-Test Means on Dynamic balance.

Adjusted Post-test Means				Mean Difference	Required CI
Proprioceptive Training	Yoga Training	Combined Training	Control Group		
91.18	90.80	---	---	0.38	1.46*
91.18	---	97.46	---	6.28*	
91.18	---	---	84.03	7.15*	
---	90.80	97.46	---	6.66*	
---	90.80	---	84.03	6.77*	
---	---	97.46	84.03	13.43*	

Table III evidenced that significant differences occurred between the adjusted means of PTG and PYTG (6.28), PTG and CG (7.15), YTG and PYTG (6.66), YTG and CG (6.77), PYTG and CG (13.43). There was no significant difference between PTG and YTG (0.38) at 0.05 level of confidence with the confidence interval value of 1.46 which indicates that there were significant differences among proprioceptive training and control group, yoga training and control group, combined training and control group on dynamic balance.

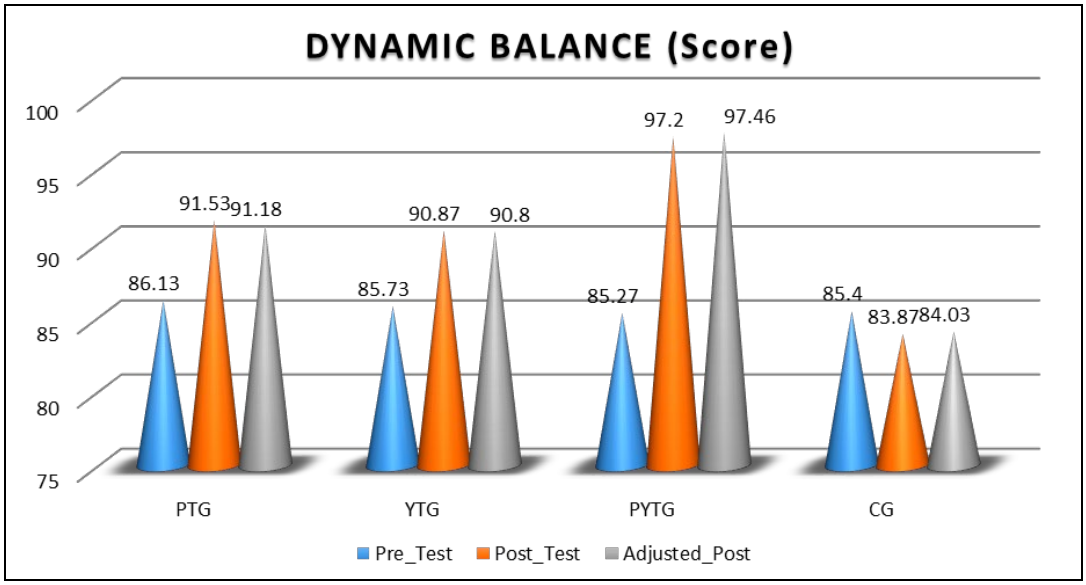

Fig 1: Showing mean values of pre-test and post-test of control and experimental groups of dynamic balance.

Discussion on Findings

The post hoc test analysis through Scheffe's Confidence test proved that due to proprioceptive training, yoga training, combined proprioceptive and yoga training groups improved dynamic balance than the control group and the differences were significant at 0.05 level. Further, the post hoc test analysis shows that there was significant difference between the experimental groups, clearly indicating that combined proprioceptive and yoga training group was better than the proprioceptive training and yoga training in improving the dynamic balance of the kho-kho players.

The result of the study showed that there was a significant improvement in dynamic balance due to 10 weeks of training programme. Further the study clearly revealing that the combination of training is better than the isolated training alone for improving dynamic balance of rural Kho-Kho players.

The findings of Zacharakis, E. D., (2020) [6] do support the findings of current study with respect to proprioceptive training effect on balancing of youth basketball players and found that 8-week proprioception training program improves adolescent basketball players' passing accuracy in both sexes, fast shooting, static balance and dynamic balance. The observation of this study is very similar to the findings of Sunil Rayat (2015) [5]. In his study effect of practice of yoga exercises on balance and perception of national level players, the researcher conclude that longer duration of yogic exercises will significantly improves the balance (static and dynamic balance) and perception. Therefore, combined proprioceptive and yoga training provides all of the benefits that each exercise type gives alone, but may supply greater overall health through a synergistic effect.

Conclusions

From the results of the study and discussion the following conclusions were drawn.

1. There is a significant difference on dynamic balance between all the groups.
2. There is a significance improvement on dynamic balance due to combined proprioceptive and yoga training.

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