

Effect of High and Moderate Intensity Aerobic Dance and Sand Training on Selected Physical Fitness Variables among Kho-Kho Players

Manivel. K¹, Dr. K. Senthikumar²

¹Ph.D scholar, Tamil Nadu Physical Education and Sports University, Chennai 600 127

²Principal, Selvam College of Physical Education, Namakkal – 637 003.

ABSTRACT

The purpose of the present study was to find out the effect of high and moderate intensity aerobic dance and sand training on selected physical fitness variables among kho-kho players. To achieve the purpose of the study, school boys kho-kho players were selected from govt boys school, namakkal, tamilnadu. The subject's age between 15 to 17 years. The selected subjects were divided into three equal groups consisting of twenty kho-kho players each, namely experimental group I, experimental group II, and control group. The experimental group I underwent a high and moderate intensity aerobic dance training program for twelve weeks. The Experimental Group II underwent a high and moderate intensity sand training program for twelve weeks. The control group was not participating in any training during the study. Agility, speed and muscular endurance were taken as criteria variables in this study. The pre-test and post-test scores were subjected to statistical analysis of covariance (ANCOVA) to find out the significance of the mean differences. Scheffe's post hoc analysis was used whenever the F-ratio was found to be significant for the adjusted test. In all cases, a significance level of 0.05 was adopted to test the hypotheses. The result showed that significant differences were found on the criterion variables. The difference is found due to high and moderate intensity aerobic dance training and high and moderate intensity sand training given to the experimental group on agility, speed and muscular endurance when compared to the control group.

Keywords: aerobic dance training and sand training, physical Fitness Variables, kho-kho Players.

INTRODUCTION

Kho-Kho is a high-intensity indigenous sport that requires speed, agility, muscular endurance, and explosive power for successful performance (Verma & Singh, 2018). These physical fitness components enable players to perform rapid accelerations, quick directional changes, and repeated high-intensity efforts throughout the game (Bompa & Buzzichelli, 2019).

Aerobic dance has been recognized as an effective training method for improving cardiovascular fitness, muscular endurance, coordination, and overall physical performance (American College of Sports Medicine [ACSM], 2022). Likewise, sand training provides greater muscular activation due to the unstable surface, resulting in improvements in sprinting ability, agility, and lower-body power while reducing impact-related stress (Impellizzeri et al., 2008).

Training intensity plays a significant role in determining physiological adaptations. High-intensity exercise generally produces greater improvements in physical fitness than moderate-intensity exercise when appropriately prescribed (**Garber et al., 2011**). However, moderate-intensity training remains effective in enhancing aerobic fitness and muscular endurance while minimizing fatigue.

Although previous studies have examined aerobic dance and sand training independently, limited research has investigated their combined effects at different intensities among Kho-Kho players. Therefore, the present study aims to examine the effects of high- and moderate-intensity aerobic dance and sand training on selected physical fitness variables, namely speed, agility, muscular endurance, and explosive power among Kho-Kho players. The study has been carried out to study the Effect of high and moderate intensity aerobic dance and sand training on selected physical fitness variables among kho-kho players.

SPEED

Speed is the ability to move the body or its parts from one point to another in the shortest possible time. In sports such as Kho-Kho, speed is essential for chasing opponents, escaping defenders, and responding quickly during offensive and defensive situations. It is influenced by factors such as reaction time, stride length, stride frequency, muscular strength, and neuromuscular coordination. Regular high-intensity training, plyometric exercises, and sprint drills can significantly improve speed performance. **Bompa, T. O., & Buzzichelli, C. (2019).**

AGILITY

Agility is the ability to rapidly change the direction or position of the body while maintaining balance, speed, and control in response to a stimulus. It is a critical component of Kho-kho, where players frequently accelerate, decelerate, dodge opponents, and change direction within a limited space. Agility depends on speed, balance, coordination, reaction time, and lower-body strength. Training methods such as ladder drills, cone drills, sand training, and plyometric exercises are effective in enhancing agility. **Bompa, T. O., & Buzzichelli, C. (2019)**

MUSCULAR ENDURANCE

Muscular endurance is the ability of a muscle or muscle group to perform repeated contractions or sustain a contraction over an extended period without excessive fatigue. It is an essential component of physical fitness and plays a vital role in sports such as Kho-kho, where players are required to perform repeated sprinting, chasing, dodging, and rapid movements throughout the game. Higher muscular endurance enables athletes to maintain performance, delay fatigue, and recover more efficiently during prolonged competition. **Bompa, T. O., & Buzzichelli, C. (2019)**

SELECTION OF SUBJECTS

The purpose of the study was to find out the Effect of high and moderate intensity aerobic dance and sand training on selected physical fitness variables among kho-kho players. To achieve the purpose of the study Kho-Kho players were selected from Govt. ITI boys, Namakkal

SELECTION OF VARIABLE

INDEPENDENT VARIABLE

1. High and Moderate Intensity Aerobic Dance Training
2. High and Moderate Intensity Sand Training

DEPENDENT VARIABLES

- Agility
- Speed
- Muscular Endurance

EXPERIMENTAL DESIGN AND IMPLEMENTATION

The selected subjects were divided into three equal groups, each composed of twenty kho-kho players, experimental group I, experimental group II and control group. The experimental group I underwent a high and moderate intensity aerobic dance training programme for twelve weeks. The experimental group II underwent a high and moderate intensity sand training programme for twelve weeks. The control group did not participate in any training during the study. Speed, agility and Muscular Endurance was taken as criterion variable in this study. The pre-test was taken before the training period and the post-test was measured immediately after the twelve-week training period.

STATEMENT OF THE PROBLEM

The purpose of the study was to assess combined of high and moderate intensity aerobic dance and sand training on physical fitness variables among kho-kho players.

HYPOTHESES

- It was hypothesized that there would be a significant improvement on high and moderate intensity aerobic dance among kho-kho players.
- It was hypothesized that there would be a significant improvement on high and moderate intensity sand training among kho-kho players.
- It was hypothesized that there would be a better significant improvement on high and moderate intensity aerobic dance and sand training on selected motor fitness variables among kho-kho players.

STATISTICAL TECHNIQUE

The ANCOVA test was used to analysis the significant differences, if any, difference between the groups respectively.

LEVEL OF SIGNIFICANCE

The proper significance level was determined by fixing the confidence level at 0.05.

ANALYSIS OF THE DATA

Using a pre-test, it was possible to determine the significance of the difference between the means of the experimental group. The obtained data were subjected to statistical treatment using ANCOVA test. In all cases 0.05 levels was fixed to test the hypothesis of this study.

RESULTS

Table 1

Analysis of Covariance for pre, post and adjusted post test performance of experimental gr I, experimental gr II and control group on Agility

Test	Exp gr I	Exp gr II	Control gr	Sv	Ss	Df	MS	F
Pre test	18.56	18.52	25.89	Between within	719.63 2141.61	2 57	359.82 37.57	9.58
Post test	17.58	17.45	25.64	Between within	878.97 2018.08	2 57	439.48 35.40	12.41
Adjusted	19.90	19.81	20.96	Between within	12.090 61.718	2 56	6.04 1.10	5.48
Mean gain	0.977	1.07	0.25					

Scheffe's post hoc test for Agility

Exp.GP I	Exp.GP II	Control GP	MD	CI
19.90	19.81	-	0.09	1.02
19.90	-	20.96	1.05	1.02
-	19.81	20.96	1.15	1.02

* Significant at 0.05 level of confidence

The result of the study indicated that there was a significant difference between the adjusted post test mean of the experimental group I high and moderate intensity aerobic dance, experimental group II high and moderate intensity sand training and the control group at 0.05 levels. The pre, post and adjusted post test mean values of the experimental group 1, experimental group 2 and the control group on experimental group is graphically represented in the figure 1.

Figure – 1

Bar diagram showing the pre and post test and adjusted post test performance of High and moderate intensity aerobic dance, Sand training and control group on agility

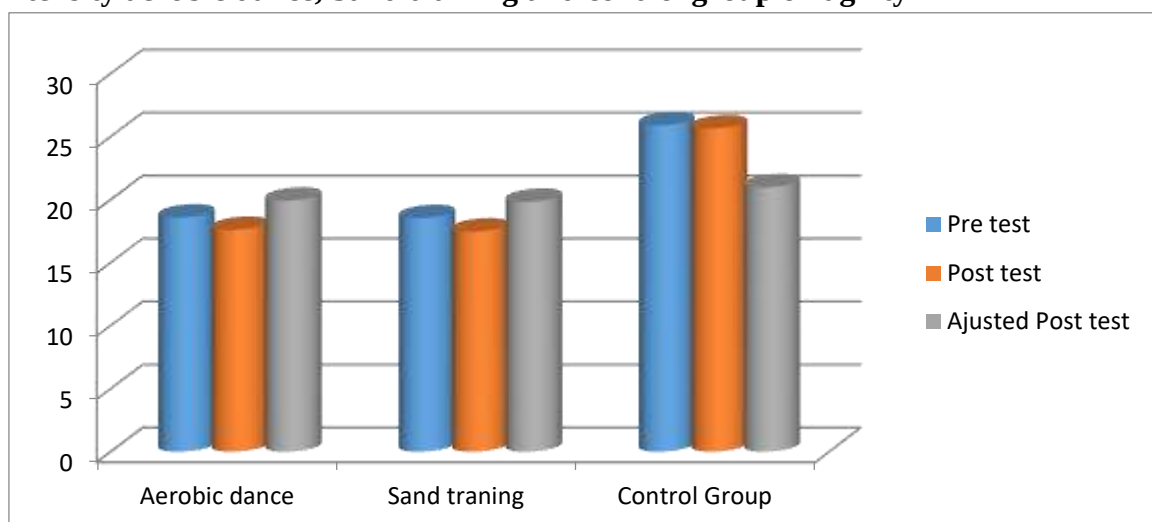


Table 2

Analysis of Covariance for pre, post and adjusted post test performance of experimental gr 1, experimental gr 2 and control group on Speed

Test	Exp gr I	Exp gr II	Control gr	Sv	Ss	Df	MS	F
Pre test	9.13	8.30	12.17	Between within	166.30 656.57	1 58	166.30 11.32	14.69
Post test	7.96	7.77	12.47	Between within	283.00 568.81	1 58	283.00 9.81	28.86
Adjusted	12.90	13.44	14.76	Between within	30.86 70.57	1 57	30.86 1.24	24.92
Mean gain	1.16	0.53	0.30					

Scheffe's post hoc test for Speed

Exp.GP I	Exp.GP II	Control GP	MD	CI
12.90	13.44	-	0.53	0.76
12.90	-	14.76	1.86	0.76
-	13.44	14.766	1.33	0.76

* Significant at 0.05 level of confidence

The result of the study indicated that there was a significant difference between the adjusted post test mean of the experimental group I high and moderate intensity aerobic dance training, experimental group II high and moderate intensity sand training and the control group at 0.05 levels. The pre, post and adjusted post test mean values of the experimental group 1, experimental group 2 and the control group on experimental group is graphically represented in the figure 2.

Figure – 2

Bar Diagram showing the pre and post test and adjusted post test performance of aerobic dance training, sand training and control group on speed.

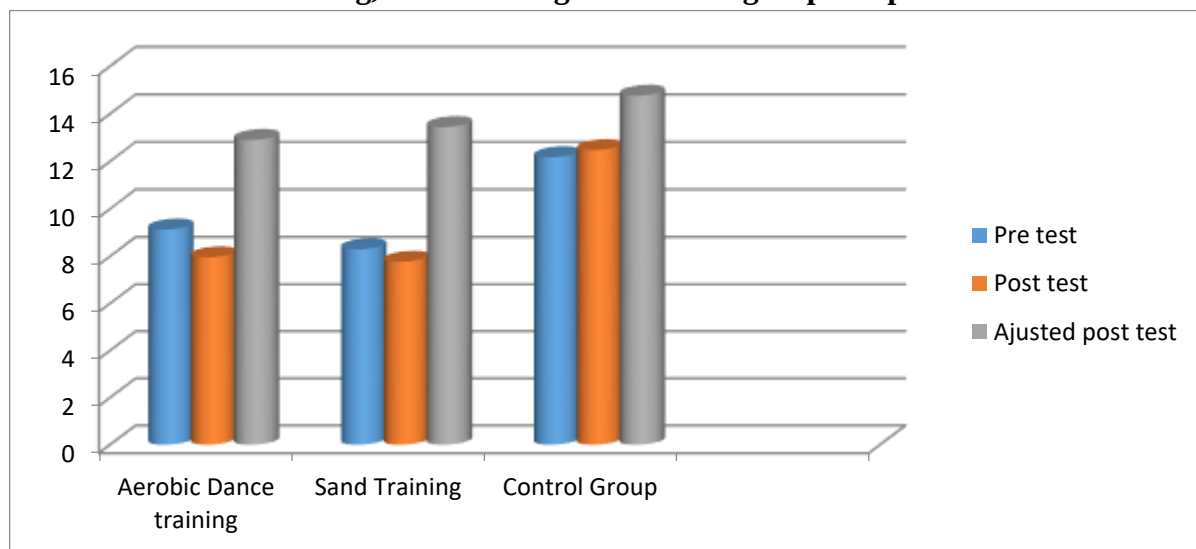


Table 3

Bar Diagram showing the pre and post test and adjusted post test performance of aerobic training, sand training and control group on muscular endurance.

Test	Exp gr I	Exp gr II	Control gr	Sv	Ss	Df	MS	F
Pre test	13.45	14.60	11.35	Between within	108.63 1636.30	1 58	108.63 28.21	3.85
Post test	17.3	18.4	11.30	Between within	584.13 2223.20	1 58	584.13 38.33	15.24
Adjusted	23.77	23.68	19.94	Between within	180.49 470.70	1 57	180.49 8.26	21.6
Mean gain	3.85	3.80	0.05					

scheffe's post hoc test for muscular endurance

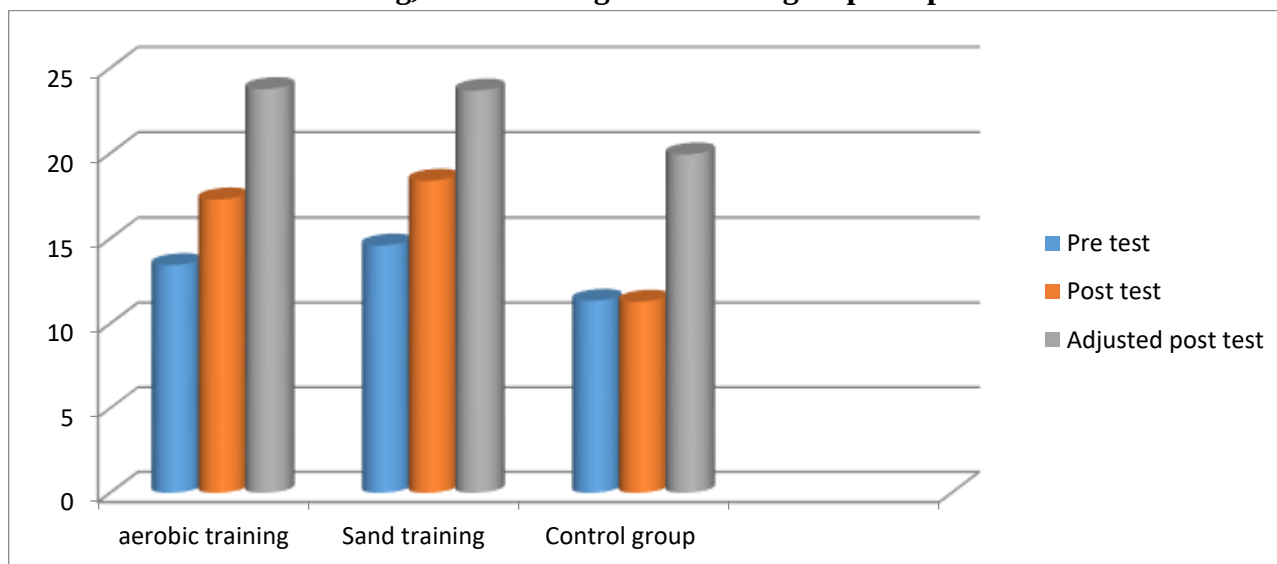
Exp.GP I	Exp.GP II	Control GP	MD	CI
23.77	23.68	-	0.09	1.97
23.77	-	19.94	3.83	1.97
-	23.68	19.94	3.74	1.97

* Significant at 0.05 level of confidence

The result of the study indicated that there was a significant difference between the adjusted post-test mean of the experimental group I high and moderate intensity aerobic dance training, experimental group II high and moderate intensity sand training, and control group at 0.05 levels. The pre, post, and adjusted post test mean values of the experimental group 1, experimental group 2, and the control group in the experimental group are graphically represented in figure 3.

Figure -3

Bar diagram showing the pre and post test and adjusted post test performance of aerobic dance training, sand training and control group on speed.



DISCUSSION ON FINDINGS

The results of the study indicated that the selected physical fitness variables, such as agility, speed and muscular endurance, were improved significantly after undergoing high and moderate intensity aerobic dance training and high and moderate intensity sand training. The players' training package was properly planned, prepared, and carried out, which resulted in changes to the chosen parameters. The findings of the present study had similarity with the findings of **Andrew (2023)**. The results of the present study indicate that the aerobic dance training and sand training methods are appropriate protocols to improve agility, speed, and muscular Endurance of kho-kho players. The result of the present study is very clear: the selected physical fitness variables, such as agility, speed and muscular endurance improvement, significantly increased due to kho-kho training.

CONCLUSIONS

1. It was noticed that practice of high and moderate intensity aerobic dance training and high and moderate intensity sand training helped to improve selected physical fitness variables of kho-kho players.
2. It was also observed that there was progressive improvement in selected criterion variables of an experimental group of kho-kho players after twelve weeks of a specific kho-kho training program. In addition, it also helps in improving selected physical fitness variables such as agility, speed and muscular endurance.

REFERENCE

1. Kumar, M., Rizvi, M. R., et.,al.(2026). Pre-post changes in agility, balance, and functional movement during short-term functional strength and balance training in national-level Kho-Kho players. Scientific Reports.
2. Kavithashri, P. K., Ganesan, A., et.,al. (2025). Influence of Speed Endurance and Speed–Agility–Quickness Training on Cardiovascular Fitness in Male College-Level Kho-Kho Players. Sch Int J Anat Physiol, 8(6), 126-131.
3. Kumar, M. N, (2024) Enhancing Cardiovascular Endurance in Kho-Kho Players: A Comparative Analysis of Proprioceptive, Yoga, and Combined Training Program Educational Administration: Theory and Practice, 30(5), 10734-10738.
4. Tripathi, H., Pandey, P., et.,al. (2024). Correlating Physical Fitness and Performance Metrics in Kho-Kho Athletes. African journal of biomedical research, 613-622.
5. Das, M., & Chatterjee, K. (2019). Effect of high and moderate intensity interval training on aerobic capacity of kho-kho players.
6. Reddy, P. V., & Murali, R. (2021). Application of plyometric training on the development of physical fitness among university athletes in mahatma gandhi university, nalgonda. Lulu Publication.
7. Binnie, M. J., Dawson, B.,et.,al. (2014). Sand training: a review of current research and practical applications. Journal of sports sciences, 32(1), 8-15.
8. Binnie, M. J., Dawson, B.,et.,al. (2014). Effect of sand versus grass training surfaces during an 8-week pre-season conditioning programme in team sport athletes. Journal of sports sciences, 32(11), 1001-1012.