

Effectiveness of Calisthenics Training versus Circuit Training in Improving Endurance and Coordination among Kabaddi Players

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Abstract: *Kabaddi is a high-intensity sport requiring endurance, coordination, agility and rapid body control. This study compared the effects of calisthenics training and circuit training on endurance and coordination among kabaddi players. A quasi-experimental study was conducted among 20 male kabaddi players aged 18-24 years. Participants divided into two groups of 10. Group A received calisthenics training and Group B received circuit training for 6 weeks, with sessions conducted 4 days per week. Endurance was assessed using the bend-knee sit-ups test and coordination using a hand-eye coordination test with a tennis ball. Pre-test and post-test values were analysed using paired and unpaired t-tests. Both groups showed significant within-group improvement. Between-group analysis showed significant post-test differences for endurance ($t=3.43$) and coordination ($t=3.96$). The study reported greater improvement in Group A. Based on the study findings, calisthenics training was concluded to be more effective than circuit training for improving endurance and coordination among the kabaddi players.*

Keywords: Calisthenics training, Circuit training, Endurance, Coordination, Kabaddi players

1. Introduction

Kabaddi is a physically demanding contact team sport that requires endurance, strength, agility, reaction time, speed and coordination. Players repeatedly perform high-intensity movements while maintaining body control and responding rapidly to opponents. Therefore, physical conditioning is an important component of kabaddi performance.

Circuit training consists of a sequence of exercises performed consecutively with limited rest and can combine aerobic and resistance components.

Calisthenics training primarily uses body-weight movements such as running drills, push-ups, squats, jumps and lunges. Both methods are used in sports conditioning, but their comparative effects on endurance and coordination among kabaddi players remain an area of interest.

The present study therefore compared calisthenics training and circuit training in improving endurance and coordination among kabaddi players.

2. Need for the Study

Kabaddi requires repeated bouts of physical effort together with precise motor control. The project identified limited comparative research specifically examining calisthenics and circuit training for endurance and coordination in kabaddi players.

Comparing these approaches may help inform sport-specific conditioning programmes.

3. Aim and Objectives

Aim

To compare the effect of calisthenics training versus circuit training in improving endurance and coordination among kabaddi players.

Objectives

- 1) To determine the effect of calisthenics training on endurance and coordination.
- 2) To determine the effect of circuit training on endurance and coordination.
- 3) To compare the effects of the two training approaches.

4. Materials and Methods

Study design: Quasi-experimental study. Setting: Sree Abirami College of Physiotherapy, Coimbatore. Sample: 20 male kabaddi players, 18–24 years, selected by convenient sampling and divided into Group A ($n=10$) and Group B ($n=10$). Study duration: 6 months; treatment duration: 6 weeks.

Inclusion criteria included male kabaddi players aged 18–24 years, at least one year of playing experience, college students and cooperative participants. Players with recent lower-limb injury, musculoskeletal disorders, or non-

cooperative behaviour were excluded.

Outcome measures: Endurance was assessed using the bend-knee sit-ups test and coordination using a hand-eye coordination test with a tennis ball. Pre-test and post-test measurements were recorded.

Intervention: Group A received a structured calisthenics programme and Group B a structured circuit programme for 6 weeks, 4 days per week. Sessions included warm-up, main activity and cool-down. The project describes approximately 35–40 minute sessions.

5. Statistical Analysis

Paired t-tests were used to compare pre-test and post-test values within each group. Unpaired t-tests were used for between-group comparisons. Statistical significance was interpreted at the 5% level as described in the project.

6. Results

Pre- Post- Between-Outcome Group test test group

Outcome	Group	Pre- Test Mean	Post- Test Mean	Paired t	Between Group Post Test t
Bend-knee sit-ups	Calisthenics (A)	20	23	24	3.43
	Circuit (B)	19	21	16	3.43
Hand Eye Coordination	Calisthenics (A)	15	18	24	3.96
	Circuit (B)	14	17	11.69	3.96

Group A improved from 20 to 23 repetitions in the bend-knee sit-ups test and from 15 to 18 in the hand-eye coordination test. Group B improved from 19 to 21 and from 14 to 17, respectively. The reported between-group post-test t-values were 3.43 for endurance and 3.96 for coordination, exceeding the reported critical value of 2.262.

7. Discussion

The findings of the project indicate significant improvement in both groups after 6 weeks of training. Calisthenics training produced a larger pre-test to post-test change in the reported endurance measure (3 versus 2) and an equivalent numerical change in the coordination measure (3 versus 3), while the reported post-test group comparison was statistically significant. The project literature review also cites studies describing benefits of calisthenics for physical fitness and circuit training for muscular endurance and coordination.

8. Conclusion

Within the conditions of this study, both calisthenics and circuit training improved endurance and coordination among the participating kabaddi players. The project reported greater overall improvement with calisthenics training and concluded that calisthenics training was more effective than circuit training for the measured outcomes.

9. Limitations

The study used a small sample size, included only male kabaddi players aged 18–24 years, and assessed only endurance and coordination outcomes.

10. Recommendations

Future studies may use larger samples, wider age groups, other sports populations, and additional outcomes such as flexibility and dynamic balance.

References

- [1] Agalyadharshini. Effects of calisthenics training on flexibility, muscle strength, and muscle endurance in sedentary college students. *Journal of Physical Education and Health*. 2024;12(3):45–52.
- [2] Bhat RA, Dachen S, Hajam MA. A comparative study of selected physical fitness variables among college men Kabaddi and Kho-Kho players. *International Journal of Physical Education, Sports and Health*. 2018.
- [3] Bianco A, Jemni M, Thomas E, et al. A systematic review to determine the validity of the sit-up test for assessing muscular endurance. *Journal of Strength and Conditioning Research*. 2015;29(9).
- [4] Cin S, Cabuk R. Effects of running-based HIIT and calisthenics-based HIIT using the Tabata protocol on physical performance of gendarmerie cadets. *Journal of Physical Education and Sport Sciences*. 2025.
- [5] Cristea-Mic D, Costea M. Influence of circuit training on the development of coordination abilities in U16 handball players. *Journal of Physical Education and Sport*. 2020;20(5):2783–2789.
- [6] Faber IR, Oosterveld FGJ, Nijhuis-Van der Sanden MWG. Does an eye–hand coordination test have added value as part of talent identification in racket sports? *PLoS ONE*. 2014;9(1):e85657.
- [7] Gude S, Chandrasekaran K. Effect of super circuit training on leg strength and strength endurance among college men Kabaddi players. *International Journal of Physical Education, Sports and Health*. 2021;8(3):45–49.
- [8] Irawan R, Lesmana HS. Validity and reliability of eye–hand coordination tests using overhead and under-arm throw methods in basketball players. *Journal of Physical Education, Sport, Health and Recreation*. 2019.
- [9] Kaya M, Çilli M, Ersöz G. Comparison of calisthenics and Pilates exercises on lower-limb coordination. *Journal of Sports Science and Medicine*. 2012.
- [10] Kisner C, Colby LA, Borstad J. *Therapeutic Exercise: Foundations and Techniques*. 7th ed. Philadelphia: F.A. Davis; 2018.
- [11] Kukić F, Čvorović A, Dawes JJ, Orr RM. Factorial and construct validity of sit-up tests performed for different durations in the assessment of trunk muscular endurance. *Journal of Strength and Conditioning Research*. 2022.
- [12] Marwat MK, Khan A, Ali S. Effects of calisthenics training on coordination, flexibility, and endurance

among Kabaddi players. Journal of Physical Education and Sport Sciences. 2021.

- [13] Pranatahadi S, Aziz AN. Validity of the PAB tennis ball catch–throw test for measuring hand– eye coordination among beginner volleyball players. Proceedings of YISHPESS. 2019:760–763.
- [14] Shanmuga Sundaram R, Vallimuragan K. Effects of yoga practice combined with circuit resistance training and resistance training on muscular strength endurance and skill performance among Kabaddi players. International Journal of Physical Education, Fitness and Sports. 2013.
- [15] Vadivel S, Maniazhagu D. Effects of circuit training and circuit weight training on muscular strength endurance among male Kabaddi players. International Journal of Physical Education and Sports Sciences. 2022.

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