Original Article
ISSN (Online): 2582-7472

ShodhKosh: Journal of Visual and Performing Arts
May 2024 5(5), 972–981

INVESTIGATING THE IMPACT OF SIX-WEEK KETTLEBELL TRAINING ON SELECTED BIO MOTOR ABILITIES AND PERFORMANCE VARIABLES OF KABADDI PLAYERS

Selvaraj Suryaraj [1], Mariyappan Rajkumar [1]

[1] Development of Research Methodology, Data Collection, Statistical Analysis, Preparation of the Manuscript, Bharathiar University, Coimbatore, Tamil Nadu, India

ABSTRACT

Background and study aim: Kabaddi requires strength, agility, endurance, and speed for optimal performance. Kettlebell training, known for enhancing functional strength and cardiovascular fitness, has gained popularity, but its impact on kabaddi players' bio motor abilities remains underexplored. To investigate the impact of six-week kettlebell training on selected bio motor abilities and performance variables of kabaddi players.
Material and methods: Twenty-four male kabaddi players were randomly assigned to the kettlebell training group (KBTG) (N = 12) (Age: 21.08±0.9, Height: 168.251±3.86, Weight: 65.16±2.32) and control group (CG) (Age: 20.03±0.84, Height: 165.02±4.81, Weight: 57.83±4.36) and their age ranged between 18 and 23. Subjects were randomly selected from the Department of Physical Education, Bharathiar University Coimbatore, Tamil Nadu, India. Twelve subjects underwent kettlebell training (Kettlebell Training Group) and the other 12 underwent regular activity (Control Group).
Testing Variables: The study assessed various bio motor abilities and performance variables to evaluate in the impact of kettlebell training. Balance was measured using the standing stroke test, while flexibility was assessed through the sit and reach test. Maximum strength was determined via the 1RM Bench Press. Additionally, toe touch performance was rated subjectively and considered a dependent variable for overall performance assessment.
Statistical Analysis: Means and standard deviations (±) described all data, with Shapiro-Wilk tests checking for normality ($p < 0.05$). A dependent 't' test determined significant mean differences between kettlebell training group and control groups ($p < 0.05$).
Results: The bio motor and performance variables revealed significant improvements in the participants who followed the kettlebell training regimen compared to the control group ($p < 0.05$). Kettlebell training significantly improved the balance, flexibility, maximum strength, and overall performance in the toe touch of Kabaddi players.
Conclusion: Kettlebell training shows significant promise in enhancing bio motor abilities and performance variables of kabaddi players, suggesting its effectiveness over traditional training methods. These findings highlight the need for further research and the potential integration of kettlebell training into kabaddi training programs to optimise player performance.

Keywords: Kettlebell training, Bio Motor, Performance variables and kabaddi players

Corresponding Author
Selvaraj Suryaraj,
s.suryaraj3198@gmail.com

DOI
10.29121/shodhkosh.v5.i5.2024.4770

Funding: This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

1. INTRODUCTION

In recent years, kettlebell exercises have made a significant comeback in the fitness industry. This resurgence focuses on predominantly ballistic movements that are relatively straightforward and engage the entire body. A prime example of this is the kettlebell swing, which serves as a foundational exercise. For a comprehensive guide on the kettlebell swing, including detailed instructions and techniques, refer to pages 43–59 of Tsatsouline's Enter the Kettlebell

[1]. Kettlebells have been used for over a century and were popular among circus strongmen in the late 1800s. Some historians suggest that kettlebells date back even further, possibly to the Celts, who made them from stone. Regardless of their exact origins, kettlebells are experiencing a remarkable resurgence in both athletic strength and conditioning programs, as well as in everyday fitness routines across the globe. Their versatility and effectiveness have made them a key tool for improving strength, endurance, and overall fitness [4].

Kettlebell training is a highly effective form of strength training that emphasizes functional, whole-body movements. Unlike traditional fitness machines, which typically work in one plane, kettlebell exercises engage multiple planes of motion. They are versatile, durable, and space-efficient, making them an ideal choice for both isolated and compound movements [2]. Kettlebells have long been a fundamental part of Russian culture, akin to vodka, but the first official kettlebell competition was held in 1948. The sport surged in popularity during the 1970s, especially in Russia, Ukraine, and the Baltic states of Latvia, Lithuania, and Estonia. In 1974, Girevoy sport was recognized as an "ethnic sport" by various Soviet republics. The inaugural USSR National Girevoy Sport Championship took place in the fall of 1985, during Perestroika and Glasnost, focusing on the power clean and jerk and the one-arm power snatch [3].

Kettlebell training targets multiple muscle groups, including the glutes, hamstrings, quadriceps, core, shoulders, and back. It enhances grip strength, stability, and cardiovascular endurance while improving functional movement patterns [5]. Briefly, swing exercise is initiated by this study quantifies the mechanical demands of the two-handed kettlebell swing, indicating it enhances rapid force application but may not significantly improve absolute maximal strength for athletes [7]. Existing longitudinal studies on kettlebell training are underpowered and methodologically weak, providing limited guidance for therapists in primary care regarding its effectiveness for improving physical function. Further research is necessary [8]. Traditional strength training methods, such as free weights and Nautilus machines, focus on isolating muscles for hypertrophy. In contrast, kettlebells introduce an unstable force, promoting strength and stability, making them ideal for functional training relevant to everyday activities [9].

This study explores the Turkish Get-Up with a kettlebell, emphasizing its technique and benefits. Combined with kettlebell swings, these exercises enhance strength, stability, power, and functional fitness for improved athletic performance [10]. Research article elaborate the study thoroughly investigates the biomechanical demands of the American kettlebell swing on the arms and shoulders. It reveals distinct upper extremity forces and muscle engagement, emphasizing differences from the Russian swing and providing insights for exercise progression strategies [11]. The Kettlebell Arm Bar (KAB) is widely recognized as an effective exercise for enhancing shoulder girdle stability and mobility while also improving thoracic spine flexibility. Additionally, it provides a stretch for the latissimus dorsi and pectorals. This functional exercise is beneficial for developing skills such as the Overhead Press, Get-Up, and throwing movements [12].

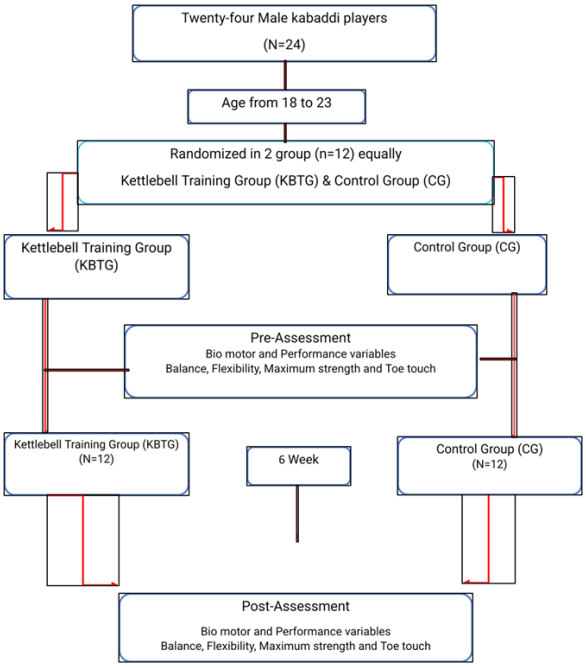

Figure 1. Schematic of the Study Design

2. MATERIAL & METHODS

Electronic searches were carried out by the investigators (MR, EB and SS). Search engines used to locate published articles included MEDLINE, EMBASE, Scopus, Science Direct Databases Directory of Open Access Journals (DOAJ), PubMed, and Google Scholar. The terms "kettlebell training", "Bio Motor", "Performance variable", and the conjunctions "OR/AND" were used as essential terms. Searches could only be conducted in English. The studies detailing how bio motor and performance variables is affected by kettlebell training are considered for literature review.

3. STUDY PARTICIPANTS

Twenty-four male kabaddi players were randomly assigned to 2 groups (i.e., KBTG and GG). using the method of randomly permuted blocks using Research Randomizer, a program published on a publicly accessible official website (www.randomizer.org) their ranged from 18 to 23 years. All subjects were advised not to decrease or increase their daily sports and regular activities over the course of the study.

4. PROCEDURES

To minimize any learning effects, participants completed two familiarization sessions for the testing procedures and three familiarization sessions for the kettlebell training before the intervention began, right before the baseline assessments. Demographic data was collected, and participants were instructed to eat clean, healthy food and avoid caffeine for three hours before testing. They were also asked to avoid any intense physical activity for a full day. To reduce the impact of daily fluctuations, pre- and post-tests were conducted at similar times of day for all participants, with specific workouts happening on the same day. Everyone followed the same testing process in the same order. On the test day, participants did a ten-minute general warm-up.

5. TRAINING INTERVENTION

The Department of Physical Education (Fitness Centre), in collaboration with qualified trainers and research scholars, has gathered a comprehensive range of resources to support effective training programs. These resources are carefully curated to ensure that individuals receive well-rounded guidance in physical fitness, sports performance, and overall wellness. For six weeks, kettlebell training was conducted on alternative 3 days and 2 days for game practices, with two non-consecutive sessions each week. In along to the kettlebell training, which was integrated into their game related training routine, the kabaddi players also completed 60-minute workouts per week and participated in two game day. Each training session began with a prescribed warm-up, including dynamic and static stretches lasting about ten minutes, followed by progressively faster running, guided by research scholars. The kettlebell program, designed to enhance explosive power, strength, and functional athleticism, included exercises such as swings, snatches, and presses. These movements targeted multiple muscle groups, improving core stability, mobility, and endurance [13]. The intensity of the training was measured using a 1RM test and the number of kettlebell swings, with volume and complexity increasing weekly. A technique-based 1RM progression was used to determine exercise intensity. For kabaddi players, kettlebell training intensity was measured by weight, repetitions, rest intervals, agility, power output, and heart rate, with all swings and lifts performed with maximum effort [14]. The training protocol was discussed with qualified kettlebell coaches Mr.Mathiyalagan Thandavarayan (Founder & Head Coach at DecaFit ®) [16]. The training program was developed using resources from online websites, research articles, and published theses [19,20].

Table 2 Kettlebell Training Protocol

Weeks	Exercises	Duration	Warm Up & Down	Repetition & Set	Rest
3-1	Kettlebell Shoulder press	min 50	min 60	10X3	Seconds 30
	Kettlebell side raise				Seconds 30
	Kettlebell Chest press				Seconds 30

	Kettlebell Sumo Deadlift				Seconds 30
	Goblet Squat				Seconds 30
	Kettlebell Lunge				Seconds 30
	Kettlebell Swing				Seconds 30
6-4	Kettlebell Shoulder press	min 50	min 60	10X4	Seconds 30
	Kettlebell side raise				Seconds 30
	Kettlebell Chest press				Seconds 30
	Kettlebell Sumo Deadlift				Seconds 30
	Goblet Squat				Seconds 30
	Kettlebell Lunge				Seconds 30
	Kettlebell Swing				Seconds 30

6. ASSESSMENT PROTOCOLS

Assessment protocols for kabaddi players are standardized procedures using specific test items to evaluate their performance and abilities, ensuring consistent, accurate measurements and comparison across different players and teams [17]. All participants received a comprehensive briefing on the research protocol and detailed information regarding the study's objectives. Baseline profiles, including subject characteristics such as age, height, weight, bio motor abilities, and performance variables, were measured. The necessary resources, including a sit-and-reach box, kettlebells, and other required testing equipment, were organized at the Department of Physical Education (fitness centre). All tests were conducted by a research scholar under the supervision of a research supervisor, ensuring a smooth and efficient research process.

7. ANTHROPOMETRIC MEASUREMENTS:

A stadiometer was used to measure participants' height, while a portable digital scale with 0.1 kg precision was used to record their weight, with participants wearing minimal clothing and no shoes. Height was measured using a tape measure following a standardized procedure. Body Mass Index (BMI) was calculated using the formula: weight (kg) divided by height (m^2), where height is squared [4].

Table 3 Anthropometric measurements.

Group	No. of Subject	Age In Years	Height In Centimetres	Weight In Kilogram
KBTG	12	0.9±21.08	3.86±168.25	2.32±65.16
CG	12	0.84±20.03	4.81±165.02	4.36±57.83

Figure 2 Shows the Anthropometric Measurements

8. BALANCE

Balance ability to maintain equilibrium when one's centre of gravity and base of support are altered [17]. Field assessment: Standing Stork Test, the objective of this test is to monitor the development of the athlete's ability to maintain a state of equilibrium (balance) in a static position. To perform this test, you will need a warm, dry location, such as a kabaddi court, along with a stopwatch and a research scholar to facilitate the process. Stand comfortably on both feet with your hands on your hips. Lift one leg and place the toes of that foot against the knee of your standing leg. On the assistant's command, raise your heel and balance on your toes. The assistant will start the stopwatch, and you should maintain your balance as long as possible without letting your heel touch the ground or moving your raised foot away from your knee. The coach will record the time you can hold the balance. Repeat the test on the other leg.

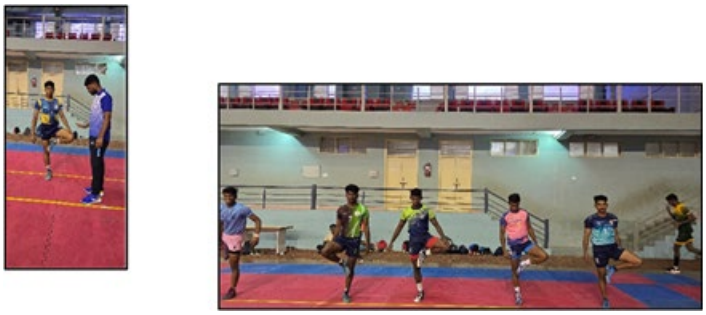

Figure 3 Shows the Standing Stork Test (Balance)

9. FLEXIBILITY

Flexibility is the ability of muscles and joints to move through a full range of motion. The Sit and Reach Test monitors an athlete's static ROM, tracking flexibility improvements and reducing injury risk. To undertake this test, you will require a 'Sit & Reach' table or a bench with a ruler. Additionally, you will need a research scholar to help conduct the test. The starting position for this test involves sitting on the floor with shoes removed, feet flat against the 'Sit & Reach' table, and legs kept straight. The individual then reaches forward, pushing their fingers along the table as far as possible. The distance from the fingertips to the edge of the table represents the score for that person. Since the 'Sit & Reach' table has a 15 cm overhang, someone who reaches 10 cm past their toes would score 25 cm. It is important to perform several warm-ups attempts before recording the best score.

Figure 4 Shows the Sit and Reach Test (Flexibility).

10. UNIVERSAL BENCH PRESS TEST

The Universal Bench Press Test is designed to assess the strength of an athlete's elbow extensors and pectoral muscles. Universal bench press station. The Universal Bench Press Test is designed to assess the strength of a kabaddi players elbow extensors and pectoral muscles. To perform this test, a Universal bench press station is required. The kabaddi players start in a hook-lying position on the bench, with knees flexed and feet placed on the bench. The initial resistance is set at 50% of the kabaddi players body weight for males and 33% for females, or adjusted based on estimated strength. The kabaddi players attempt one repetition, and if successful, a one-minute rest is given before adding additional weight. This process is repeated, with one-minute recovery intervals, until the athlete's one-repetition maximum (1RM) is reached. The final resistance is recorded as the 1RM, indicating the athlete's maximum strength for the test.

11. PERFORMANCE VARIABLES

Performance variables, including toe-touch ability, were evaluated using a rating scale. Raiders were instructed to raid the opponent's side and perform a toe-touch skill. Adequate time was allocated for general and specific warm-ups. A match-like situation was simulated, and each raider was given three attempts, with the best performance recorded. After the data collection process was completed, researchers reached out to kabaddi experts to outline the study's purpose and their role in evaluating participant performance. Each expert received a rating scale before beginning the evaluation (see Table 2 for rating purposes). All experts held diplomas in kabaddi coaching and had experience in various levels of competition. The final performance score for each participant was determined by averaging the total scores assigned by the experts [18].

Table 2 Explanation of Rating Scale

S. No	Comments	Score
1.	Very Good	5
2.	Good	4
3.	Average	3
4.	Satisfactory	2
5.	Poor	1

Figure 5 Shows the Toe Touch Execution.

12. STATISTICS TECHNIQUE

The data analysis procedure in this study consisted of two steps: the Shapiro-Wilk test and the Paired Sample t-test. This study employs a paired sample t-test hypothesis test. This test's objective is to compare the pretest and posttest results. For the statistical analysis in this study, IBM SPSS Statistics 20.0 was used. (SPSS, Inc.; USA; Chicago, IL).

Table 3 Normality Test

Group	Variables	Test	Shapiro-Wilk		
KBTG	Balance	PRE	0.91	12	0.23
		POST	0.93	12	0.43
CG		PRE	0.85	12	0.04
		POST	0.85	12	0.04
KBTG	Flexibility	PRE	0.90	12	0.17
		POST	0.89	12	0.15
CG		PRE	0.88	12	0.10

		POST	0.80	12	0.01
KBTG	Maximum Strength	PRE	0.85	12	0.04
		POST	0.92	12	0.35
CG		PRE	0.87	12	0.06
		POST	0.85	12	0.04
KBTG	Toe Touch	PRE	0.89	12	0.13
		POST	0.78	12	0.00
CG		PRE	0.80	12	0.01
		POST	0.80	12	0.01

*Note: KBTG- Kettlebell training group and CG-Control group

Based on the results of Table 4 above and from the results of the hypothesis test with the Paired Sample t- Test, the bio motor abilities and performance variables of experimental group results obtained sig (2-tailed) value of 0.000 <0.05, it can be concluded that there is a significant improvement in the selected variables due to six weeks of kettlebell training program. The mean and t-ratio for pre and post-test on Bio motor abilities and performance variables of Kettlebell training Group (KBTG) and Control Group (CG).

Table 4 Paired Sample t Test

Variables	Group	Test	Mean ± SD	t' ratio'	df	p-value
Balance	KBTG	Pre	0.45±1.85	*6.01	11	0.00
		Post	0.44±2.24		11	
	CG	Pre	0.41±1.71	1.82	11	0.09
		Post	0.40±1.72		11	
Flexibility	KBTG	Pre	1.71±40.25	*14.18	11	0.00
		Post	1.31±42.91		11	
	CG	Pre	1.37±40.08	2.17	11	0.05
		Post	1.31±40.58		11	
Maximum Strength	KBTG	Pre	1.20±41.25	*6.99	11	0.00
		Post	1.92±44.08		11	
	CG	Pre	1.37±40.41	1.77	11	0.01
		Post	1.35±40.75		11	
Toe Touch	KBTG	Pre	0.99±2.41	*9.95	11	0.00
		Post	0.90±3.91		11	
	CG	Pre	0.83±1.83	1.91	11	0.08

		Post	0.66±2.08		11	

*Note: KBTG- Kettlebell training group and CG-Control group

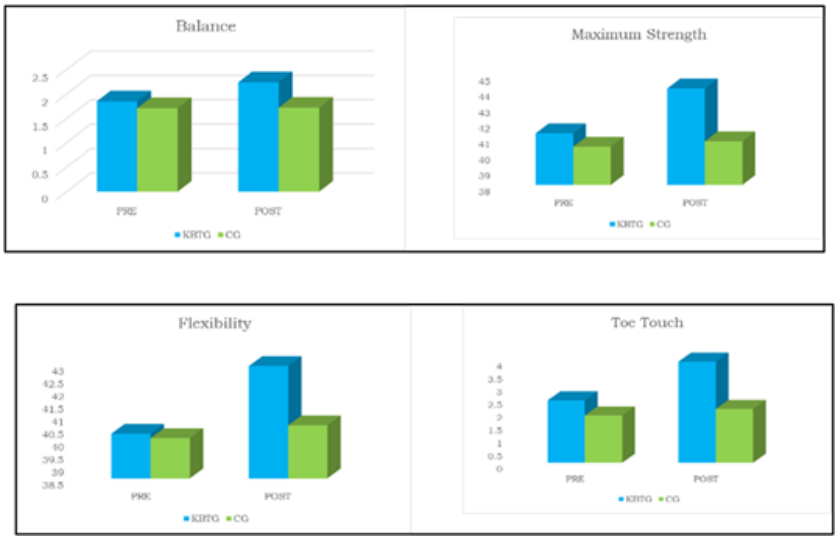

Figure 6. Bar Diagram Displays the Pre- and Post-Test Results for the Kettlebell Training Group and Control Groups for Balance, Flexibility, Maximum Strength and Toe Touch.

13. RESULTS OF THIS STUDY

1) There were no withdrawals from the study, injuries or missed training sessions among the participants.
2) The data displayed as mean ± SD sig. value; if the sig. ≥ 0.025. the data are considered normally distributed.
3) The data displayed as mean ± SD sig. value; if the sig. ≥ 0.05. The data are considered normally distributed. The result of the pre and posttest for Kettlebell training Group as well as the control group were obtained using the Shapiro-Wilk test instrument, based on the results of table 3 above. Each and every value is sig. ≥ 0.05. The paired sample t-test in para- metric statistics was used to the hypothesis because all the research results data were normally distributed.

14. DISCUSSION FINDINGS

The findings the present study indicate how kettlebell training enhances maximal strength in kabaddi players by targeting key muscle groups, improving balance and flexibility. This strength improvement performance variables in offensive and defensive actions, essential for success in kabaddi. Numerous experimental studies over the past few decades have demonstrated that kettlebell training positively impacts both sport-specific tasks, such as biomotor abilities and performance variables, and enhances player capacities like speed, balance, flexibility, muscular strength, and toe-touch performance [21]. Kettlebell training significantly improved flexibility and balance, according to our research. Research from the past has confirmed this finding: athletes significantly increased in (13.7%) balance as well as improvement in flexibility (22). The reviews that used different inclusion criteria than the current study yielded results that were comparable to ours, suggest that specific kettlebell training could be effective in indicating an increase in balance [23]. Increases in balance and flexibility performance may be explained by a number of physiological factors, some of which share similarities with the previously mentioned improvements in Lower Limb Power and Body Balance [24]. First, motor unit recruitment patterns are changed by plyometric exercise (primarily in the fast muscle fibres) [31]. A six-week kettlebell training program significantly enhanced kabaddi players' bio motor abilities, including balance, maximum strength and flexibility aligning with findings from [25] Improvements included better explosive power, agility, tackling success, raiding efficiency, and quicker recovery times. Gains in increasing balance and flexibility following kettlebell training may be attributed to three key factors enhanced strength in the lower body muscles, particularly the quadriceps improved braking and stabilization abilities and increased muscle force output and

movement efficiency. Kettlebell training not only focuses on strength development but also promotes functional movements that are essential for kabaddi players, enabling them to perform better in high-intensity activities that require rapid changes in speed and direction. Research indicates that a structured six-week kettlebell training program, incorporating both upper and lower limb exercises, can lead to significant improvements in performance variables such as balance, flexibility and maximum strength among kabaddi players. Furthermore, it is suggested that kettlebell training enhances muscle coordination, balance, flexibility, and overall athletic readiness, which are critical bio motor abilities for effective performance in kabaddi.

15. CONCLUSIONS

The six-week kettlebell training program showed clear benefits for kabaddi players in balance, flexibility, maximum strength, and toe-touch performance. Through functional movements with kettlebells, players improved core stability, which helped with better balance essential for quick moves and stability in kabaddi. The program also increased flexibility by enhancing joint mobility, allowing players to move more freely and reduce the risk of injury during intense gameplay. In addition, players showed a boost in maximum strength, which is crucial for powerful tackles and defensive plays. Improved toe-touch performance highlighted gains in lower body flexibility and hip mobility, important for the agility and quick actions needed on the kabaddi mat. Overall, this six-week kettlebell training was effective in developing multiple physical qualities, proving to be a valuable addition to kabaddi training by helping players improve their performance and physical readiness for the game.

CONFLICT OF INTERESTS

None.

ACKNOWLEDGMENTS

None.

REFERENCES

Bellomo, D., & Curtis, B. (2010). Kettlebell training for athletes: Develop explosive power and strength for martial arts, football, basketball, and other sports. (No Title).

Beltz, N., Erbes, D., Porcari, J. P., Martinez, R., Doberstein, S., & Foster, C. (2013). Effects of kettlebell training on aerobic capacity, muscular strength, balance, flexibility, and body composition. Journal of Fitness Research, 2(2), 4-13.

Coffel, L., & Liebenson, D. C. (2017). The kettlebell arm bar. Journal of bodywork and movement therapies, 21(3), 736-738.

Cotter, S. (2021). Kettlebell training. Human kinetics.

Dave Bellomo (2010) Kettlebell training for athletes.

Erbes, D. A. (2012). The effect of kettlebell training on body composition, flexibility, balance, and core strength (Doctoral dissertation).

Grigoletto, D., Marcolin, G., Borgatti, E., Zonin, F., Steele, J., Gentil, P., & Paoli, A. (2020). Kettlebell Training for female ballet dancers: effects on lower limb power and body balance. Journal of Human Kinetics, 74, 15.

Hartle, M. (2023). Kettlebell Strength Training Anatomy. Human Kinetics.

Jaiswal, P. R., Ramteke, S. U., & Shedge, S. (2024). Enhancing Athletic Performance: A Comprehensive Review on Kettlebell Training. Cureus, 16(2).

Jonathan Pye (2005). 101 Performance Evaluation Tests. Electric World plc. https://poruniskamab.github.io/download/101.pdf

Kumar, MS. Impact of sport vision training for enhancing selected visual skills and performance factors of novice hockey players, Journal of Movement Education and Exercises Sciences, Vol 1, No. 1, 2011, 1-5.

Lake, J. P., & Lauder, M. A. (2012). Kettlebell swing training improves maximal and explosive strength. The Journal of Strength & Conditioning Research, 26(8), 2228-2233.

Lake, J. P., & Lauder, M. A. (2012). Mechanical demands of kettlebell swing exercise. The Journal of Strength & Conditioning Research, 26(12), 3209-3216.

Leatherwood, M. D., Whittaker, A., & Esco, M. R. (2014). Exercise technique: The Turkish get-up with a kettlebell. Strength & Conditioning Journal, 36(6), 107-110.

Liebenson, C. (2011). Functional training with the kettlebell. Journal of bodywork and movement therapies, 15(4), 542-544.

Manjunatha, S. K., & Prakash, S. M. (2017). Construction of norms for kabaddi skill tests. International Journal of Physical Education, Sports and Health, 4(4), 328-329.

Meigh, N. J., Keogh, J. W., Schram, B., & Hing, W. A. (2019). Kettlebell training in clinical practice: a scoping review. BMC Sports Science, Medicine and Rehabilitation, 11, 1-30.

Meigh, N. J., Keogh, J. W., Schram, B., Hing, W., & Rathbone, E. N. (2019). The BELL (Ballistic Exercise of the Lower Limb) trial: protocol for a repeated measures single cohort pragmatic hardstyle kettlebell training program to improve grip strength, health-related physical fitness and quality of life in sedentary older adults.

Mike Mahler (2006) The Aggressive strength solution for incredible kettlebell training.

Mitchell, J., Johnson, W. M., Riemann, B., Krajewski, K., & Coates, C. W. (2015, November). Biomechanical loading of the American kettlebell swing. In ASME International Mechanical Engineering Congress and Exposition (Vol. 57380, p. V003T03A089). American Society of Mechanical Engineers.

Mr.Mathiyalagan Thandavarayan (Founder & Head Coach at DecaFit ®) https://www.linkedin.com/in/mathiyalagan-thandavarayan-92a1263a/?originalSubdomain=in

Norton, K. I. (2018). Standards for anthropometry assessment. In Kinanthropometry and exercise physiology (pp. 68-137). Routledge.

Pavel Tsatsouline (2001) The Russian kettlebell challenge xtreme fitness for hard living comrades.

Roger Hall (2013) Body sculpating with kettlebells for men.

Suresh Kumar M.& Needhi raja A. & Ivin Jabakumar, K. (2010). E-content based learning in physical education -with special reference to hockey. Conference proceedings, Bharathidasan University, 15-18.

Tang, Angela, Victoria Wilson, David Trosclair, and Caila Tongco. "The Effectiveness kettlebell Workouts."https://kettlebellkrusher.com/the-effectiveness-of-kettlebell-workouts/