

A STUDY ON THE EFFECTIVENESS OF STRENGTH TRAINING IN BOOSTING FITNESS AND SKILL PROFICIENCY AMONG VOLLEYBALL PLAYERS OF GULBARGA UNIVERSITY

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ABSTRACT

Strength training is an essential component of modern volleyball conditioning, as it enhances the physical abilities and technical performance required for competitive success. The present study aimed to examine the effectiveness of a structured strength training programme in improving selected physical fitness components and volleyball skill proficiency among players representing Gulbarga University. Thirty male volleyball players aged 18–25 years were selected using purposive sampling and randomly assigned to an experimental group ($n = 15$) and a control group ($n = 15$). The experimental group participated in a scientifically designed 12-week strength training programme, consisting of three training sessions per week, while the control group continued with their regular volleyball practice.

The selected physical fitness variables included muscular strength, muscular endurance, explosive power, speed, agility, and flexibility. Volleyball skill proficiency was assessed through standardized tests measuring serving accuracy, passing, spiking, and blocking performance. Pre-test and post-test data were collected using validated fitness and skill assessment protocols. Statistical analysis was performed using descriptive statistics, paired t -tests, independent t -tests, and analysis of covariance (ANCOVA), with the level of significance set at 0.05.

The findings revealed statistically significant improvements in all selected physical fitness variables and volleyball skill performance among the experimental group compared with the control group. The greatest improvements were observed in explosive leg power, muscular strength, agility, and spiking efficiency, demonstrating the positive influence of systematic strength training on volleyball-specific performance. The results indicate that integrating progressive resistance exercises with regular technical practice enhances both physical fitness and skill execution.

The study concludes that a structured strength training programme is an effective strategy for improving volleyball performance among university athletes. The findings provide practical guidance for coaches, physical education teachers, and sports scientists in designing evidence-based training programmes aimed at maximizing athletic performance and reducing injury risk in competitive volleyball players.

Keywords: Strength Training, Volleyball, Physical Fitness, Skill Proficiency, University Athletes, Gulbarga University, Resistance Training, Sports Performance.

INTRODUCTION

Volleyball is one of the most dynamic and physically demanding team sports, requiring players to perform explosive movements such as jumping, sprinting, diving, blocking, and spiking throughout a match. Success in volleyball depends not only on technical and tactical abilities but also on a high level of physical fitness. Among the various components of physical conditioning, strength training has emerged as a fundamental element for improving athletic performance. It enhances muscular strength, power, endurance, speed, agility, and stability, all of which are essential for effective execution of volleyball skills.

Strength training involves the systematic use of resistance exercises to improve the functional capacity of muscles and the neuromuscular system. Modern training methods, including free-weight exercises, resistance machines, plyometric drills, and bodyweight training, have become integral parts of volleyball conditioning programmes. These methods help athletes generate greater force during movements, improve jump height, increase hitting power, enhance blocking ability, and reduce fatigue during prolonged competition. Additionally, well-designed strength training programmes contribute to injury prevention by improving joint stability, muscle balance, and overall physical resilience.

At the university level, volleyball players are expected to maintain high standards of physical fitness while refining their technical skills to compete successfully in inter-university tournaments. However, many players continue to rely primarily on technical practice, often without adequate emphasis on structured strength training. This imbalance may limit improvements in performance and increase the risk of injuries. Therefore, integrating scientifically designed strength training programmes into regular volleyball practice is essential for achieving optimal performance.

Gulbarga University has consistently participated in inter-university volleyball competitions and has produced talented players. Despite this, limited research has examined the impact of systematic strength training on the physical fitness and skill proficiency of its volleyball athletes. Investigating this relationship will provide evidence-based information for coaches, trainers, and physical education professionals to develop more effective training programmes.

Therefore, the present study aims to evaluate the effectiveness of a 12-week structured strength training programme in enhancing selected physical fitness components and volleyball-specific skills among volleyball players of Gulbarga University. The findings are expected to contribute to sports science literature and provide practical recommendations for improving athletic performance at the university level.

REVIEW OF LITERATURE

Strength training has been widely recognized as a critical component of athletic development, particularly in sports that demand explosive movements and high levels of muscular power, such as volleyball. Numerous national and international studies have demonstrated that systematic resistance training significantly improves physical fitness and sport-specific performance.

Research by **Bompa and Buzzichelli (2019)** emphasized that progressive strength training enhances muscular strength, power, speed, and endurance, enabling athletes to perform repetitive high-intensity movements with greater efficiency. Similarly, **Baechle and Earle (2016)** reported that structured resistance training improves neuromuscular coordination, resulting in better force production and overall athletic performance.

In volleyball, explosive leg power and upper-body strength are essential for effective jumping, spiking, serving, and blocking. **Sheppard et al. (2011)** found that volleyball players

who participated in strength and plyometric training showed significant improvements in vertical jump height and attack performance. Likewise, **Marques et al. (2008)** concluded that combining resistance exercises with technical volleyball practice produced greater gains in muscular strength and game-related skills than technical training alone.

Several Indian studies have also highlighted the importance of strength training in university sports. Research conducted among collegiate volleyball players reported significant improvements in muscular endurance, agility, explosive power, and serving accuracy following structured strength training programmes lasting between 8 and 12 weeks. These findings suggest that progressive resistance exercises positively influence both physical fitness and skill proficiency.

Previous studies have further indicated that strength training contributes to injury prevention by improving muscle balance, joint stability, and movement efficiency. Athletes with higher levels of muscular strength are better able to tolerate the physical demands of training and competition while reducing the likelihood of overuse and acute injuries.

Although extensive research has examined the effects of strength training on volleyball performance, limited studies have specifically focused on players representing Gulbarga University. The unique training environment, facilities, and competitive exposure of these athletes warrant further investigation. Therefore, the present study seeks to bridge this research gap by evaluating the effectiveness of a structured 12-week strength training programme on selected physical fitness components and volleyball skill proficiency among Gulbarga University volleyball players. The findings are expected to provide valuable evidence for coaches, trainers, and physical education professionals in designing scientifically based training programmes.

Below are the remaining sections of your research paper in a format suitable for an **M.P.Ed., M.Phil., Ph.D., or UGC CARE journal**. The statistical tables are **sample formats** for illustration. Replace them with your actual research data before submission.

NEED AND SIGNIFICANCE OF THE STUDY

Need of the Study

Volleyball is a high-intensity sport that requires muscular strength, explosive power, agility, speed, endurance, and technical proficiency. Although university players regularly practice volleyball skills, many training programmes do not include scientifically designed strength training. Consequently, players may not achieve their full performance potential. Limited research has investigated the effectiveness of structured strength training among volleyball players of Gulbarga University. Therefore, this study was undertaken to evaluate the impact of a systematic strength training programme on selected physical fitness variables and volleyball skill performance.

Significance of the Study

- Provides scientific evidence regarding the effectiveness of strength training in volleyball.
- Assists coaches in designing evidence-based training programmes.
- Helps physical education teachers improve athlete conditioning.
- Contributes to sports science research in university-level volleyball.
- Serves as a reference for future researchers in physical education and sports sciences.

Objectives of the Study

1. To determine the effect of strength training on muscular strength.
2. To assess the effect of strength training on explosive power.
3. To examine improvements in speed, agility, flexibility, and muscular endurance.
4. To evaluate the effect of strength training on volleyball skill proficiency (serving, passing, spiking, and blocking).
5. To compare the performance of the experimental and control groups after the training programme.

Hypotheses

Null Hypotheses (H₀)

H₀₁: There will be no significant difference in physical fitness variables between the experimental and control groups.

H₀₂: There will be no significant difference in volleyball skill proficiency between the experimental and control groups after the training programme.

Alternative Hypotheses (H₁)

H₁₁: Strength training will significantly improve selected physical fitness variables.

H₁₂: Strength training will significantly improve volleyball skill proficiency.

Methodology

Research Design: Experimental pre-test–post-test control group design.

Participants: Thirty male volleyball players (18–25 years) representing Gulbarga University.

Sampling Technique: Purposive random sampling.

Groups:

- Experimental Group (n = 15)
- Control Group (n = 15)

Independent Variable: Twelve-week strength training programme.

Dependent Variables:

- Muscular strength
- Muscular endurance
- Explosive power
- Speed
- Agility
- Flexibility
- Volleyball skill proficiency

Training Programme:

Duration: 12 weeks

Frequency: 3 sessions per week

Session Duration: Approximately 60 minutes

Training included squats, lunges, bench press, shoulder press, deadlift, core exercises, medicine-ball drills, and plyometric exercises.

Physical Fitness Tests

- 1RM Bench Press
- Vertical Jump Test
- 30-m Sprint
- Illinois Agility Test
- Sit-and-Reach Test
- Push-up Test

Volleyball Skill Tests

- Serving Accuracy Test
- Passing Accuracy Test
- Spiking Accuracy Test
- Blocking Efficiency Test

Statistical Techniques

- Mean
- Standard Deviation
- Paired t-test
- Independent t-test
- ANCOVA
- Significance level: 0.05

Results and Discussion

Table 1

Comparison of Muscular Strength

Group	Pre-test Mean	Post-test Mean	t-value
Experimental	62.40	78.90	6.85*
Control	61.80	63.10	0.74

*Significant at 0.05 level.

Interpretation: The experimental group demonstrated a statistically significant improvement in muscular strength compared with the control group.

Table 2

Comparison of Explosive Power

Group	Pre-test	Post-test	t-value
Experimental	45.60	54.80	5.92*
Control	45.10	46.20	0.68

Sample ANCOVA Table

Source	SS	df	MS	F
Between Groups	215.62	1	215.62	16.84*
Within Groups	345.10	27	12.78	
Total	560.72	28		

*Significant at 0.05 level.

DISCUSSION

The findings indicate that the 12-week strength training programme significantly improved muscular strength, explosive power, agility, speed, flexibility, and volleyball-specific skills among the experimental group. Progressive resistance training enhanced neuromuscular efficiency, enabling athletes to produce greater force during jumping, spiking, and blocking. These findings are consistent with previous studies by Bompa and Buzzichelli (2019), Baechle and Earle (2016), and Sheppard et al. (2011), who reported positive effects of structured strength training on volleyball performance.

CONCLUSION

The study concludes that a scientifically designed 12-week strength training programme significantly enhances physical fitness and volleyball skill proficiency among Gulbarga University volleyball players. Incorporating structured resistance exercises into regular volleyball practice improves athletic performance and should be considered an essential component of university-level training programmes.

Practical Applications

- Coaches should integrate progressive strength training into annual training plans.
- Plyometric and resistance exercises should complement technical volleyball practice.
- Regular fitness assessments should monitor athlete development.
- Individualized training programmes should be developed based on player needs.
- Injury prevention strategies should accompany strength training.

Limitations

- Small sample size.
- Only male volleyball players were included.
- Study duration limited to 12 weeks.
- Participants represented only Gulbarga University.

- Nutritional intake and lifestyle factors were not controlled.

Recommendations

- Conduct similar studies with female volleyball players.
- Increase sample size and include multiple universities.
- Compare different strength training methods.
- Extend intervention periods beyond 12 weeks.
- Examine long-term effects on competitive performance and injury prevention.

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