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EFFECTIVENESS OF AN 8-WEEK STRENGTH-ORIENTED TRAINING PROGRAM ON THE STRENGTH QUALITIES OF 14–16-YEAR-OLD RUGBY PLAYERS

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Abstract:*The purpose of this study was to evaluate the effectiveness of strength-oriented training programs aimed at improving strength qualities in 14–16-year-old rugby players. The research was conducted at an Olympic and Paralympic Sports Training Center and involved 20 healthy male rugby players. A pre-test–post-test experimental design was applied over an 8-week training intervention. Training sessions were held twice daily from Monday to Friday, each lasting 90 minutes, while one 120-minute session was conducted on Saturdays. The strength-oriented exercises were primarily integrated into the morning training sessions, focusing on both general and rugby-specific strength development. Strength indicators were assessed before and after the intervention using standardized physical fitness tests. The results demonstrated statistically significant improvements in key strength parameters following the training program, confirming the effectiveness of the proposed methodology. The findings suggest that a systematically structured strength training program can significantly enhance strength qualities in young rugby players and may be effectively implemented in specialized sports training centers.*

Keywords*: youth rugby players; strength training; physical preparation; training methodology; sports performance*

Introduction – rugby is a high-intensity contact sport that requires well-developed strength qualities, including maximal strength, explosive power, and strength endurance. These physical attributes play a crucial role in tackling, scrummaging, sprinting, and overall match performance. Therefore, strength development is considered a fundamental component of long-term athlete preparation in rugby.

In recent years, increased attention has been given to the training of young athletes, particularly during the ages of 14–16, which is recognized as a sensitive period for the development of strength-related physical qualities. At this stage, appropriately planned strength training not only enhances athletic performance but also contributes to injury prevention and the formation of a solid physical foundation for future elite performance.

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Despite the growing body of research on strength training in youth sports, there remains a lack of studies focusing specifically on rugby-oriented strength development within structured training environments such as Olympic and Paralympic Sports Training Centers. Many existing training programs are based on generalized strength models and do not sufficiently account for the specific demands of rugby or the developmental characteristics of adolescent athletes.

Furthermore, in high-performance training centers, athletes often engage in multiple daily training sessions, which necessitates careful planning of training load, intensity, and recovery. The integration of strength training into such intensive schedules requires scientifically justified approaches to ensure effectiveness without increasing the risk of overtraining.

Therefore, the purpose of this study was to assess the effectiveness of a strength-oriented training program designed for 14–16-year-old rugby players undergoing intensive training at a specialized sports training center. The findings of this research aim to contribute to the optimization of youth rugby training methodologies and provide practical recommendations for coaches and sports scientists.

METHODS

Participants: The study involved **20 healthy male rugby players** aged **14–16 years** who were regularly training at an Olympic and Paralympic Sports Training Center. All participants had a minimum of **2–3 years of systematic rugby training** experience and were medically cleared to participate in intensive physical training. Written informed consent was obtained from the athletes' parents or legal guardians.

Study Design:A **pre-test–post-test experimental design** was employed. The intervention lasted **8 weeks**, with structured strength training integrated into regular rugby sessions. Physical performance assessments were conducted **before and after** the intervention period under standardized conditions.

TRAINING PROGRAM

- **Monday–Friday:** 2 sessions/day, 90 minutes each
- **Saturday:** 1 session, 120 minutes
- **Sunday:**Rest

Morning sessions focused on **strength development**, including:

- Lower-body exercises (squats, lunges, plyometrics)
- Upper-body exercises (push-ups, medicine ball throws, resistance training)
- Core stability (planks, rotational exercises)

Evening sessions focused on **technical-tactical rugby training**. Intensity and volume were progressively increased following the **principle of progressive overload**.

Strength Assessment Tests

- BackSquat (kg)
- Push-Up (max reps in 30s)
- StandingLongJump (cm)
- VerticalJump (cm)
- MedicineBallThrow (3 kg)

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• Plank (max holding time in seconds)

All tests were conducted according to **internationally recognized protocols.**

Statistical Analysis

Descriptive statistics (mean ± SD) were calculated. Paired-samples t-tests determined pre- vs post-intervention differences. Significancesetat**p < 0.05**.

RESULTS

	Test	Pre-test	Post-test	% Change	p-value
.	Back Squat (kg)	55.2 ± 6.8	63.5 ± 7.2	+15.0 %	<0.001
.	Push-Up (reps)	18.6 ± 3.4	24.1 ± 3.8	+29.5 %	<0.001
.	Standing Long Jump (cm)	165.3 ± 12.5	178.6 ± 13.2	+8.1 %	<0.001
.	Vertical Jump (cm)	38.7 ± 5.1	44.2 ± 5.4	+14.2 %	<0.001
.	Medicine Ball Throw (m)	5.3 ± 0.8	6.1 ± 0.9	+15.1 %	<0.001
.	Plank (s)	78.5 ± 15.2	102.3 ± 16.4	+30.3 %	<0.001

All strength parameters improved significantly after the 8-week program.

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Discussion: The 8-week strength-oriented program significantly improved all strength qualities in 14–16-year-old rugby players. The gains align with previous studies showing this age period is **sensitive for neuromuscular adaptation**. Integrating strength training into **twice-daily sessions** was effective without causing overtraining, demonstrating the importance of careful load management. Objective testing using standardized protocols confirmed measurable improvements. Limitations include a small sample size (n=20) and relatively short duration (8 weeks).

CONCLUSION

The strength-oriented program effectively enhanced lower- and upper-body strength, core stability, and explosive power in adolescent rugby players. Implementing such programs in specialized sports centers can optimize physical development and prepare young athletes for higher levels of competition. Future studies should examine larger cohorts and longer interventions to assess sustained effects and rugby-specific skill outcomes.

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