



DEVELOPMENT OF SPEED QUALITIES THROUGH NATIONAL MOVEMENT AND RELAY GAMES IN VOLLEYBALL

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Abstract: The objective of this study is to analyze the effectiveness of national movement and relay games in developing speed qualities in 15–16-year-old volleyball players. Speed plays a fundamental role in volleyball, directly influencing reaction time, sprinting, jumping, and quick directional changes. In this research, 30 volleyball players (15 males, 15 females) participated in an 8-week training program that integrated traditional movement and relay games from Uzbek national heritage. Pre- and post-intervention speed metrics were measured using standardized physical tests. Data analysis demonstrated a statistically significant improvement in sprinting speed, agility, and reaction time. This suggests that integrating national movement and relay games into training plans can be an effective and culturally enriching method for enhancing athletic performance.

Keywords: speed development, volleyball, national games, relay games, youth athletes, physical education

Introduction

Speed is a critical component in modern volleyball, impacting a player's ability to respond to ball movement, change direction quickly, and execute offensive and defensive actions effectively. Traditional speed development approaches focus on sprint drills, plyometrics, and resistance training. However, growing interest in culturally relevant and engaging training methods has led to the inclusion of **national movement games** and **relay-based activities**.



National games in Uzbekistan, such as "Chillak", "Uloq-ko'pkari", and variations of "relay tag", inherently incorporate explosive movements, rapid starts, and high reactivity. This study hypothesizes that integrating these culturally familiar and engaging games can enhance speed qualities among adolescent volleyball players.

The primary goal of the research is to assess the **effectiveness** of incorporating national movement and relay games in improving **sprint speed, agility, and reaction time** in volleyball players aged 15–16.

Methods

Participants. 30 volleyball players (15 boys and 15 girls), aged 15–16 years, from a local sports school were recruited. All participants had at least 1 year of volleyball training experience. Informed consent was obtained from parents and coaches.

Research Design. The study followed a pre-test/post-test experimental design with one experimental group ($n=30$). The intervention period lasted 8 weeks, with training sessions conducted **3 times per week**.

Intervention Plan

Each session lasted 90 minutes and consisted of:

- ✚ **Warm-up (15 minutes):** Dynamic stretching and mobility.
- ✚ **Relay/National Movement Games (40 minutes):**
 - ✚ “Chillak” adapted for reaction and sprint
 - ✚ "Relay with Flag Pass" – sprint and direction change
 - ✚ “Uloq mini tag” – quick start and stop
 - ✚ “Zamin Breaker” – dodge, duck, sprint
- ✚ **Volleyball-specific speed drills (25 minutes)**
- ✚ **Cool-down (10 minutes)**

Speed Measurement Tests

Speed was assessed using standardized tests:

- ✓ **10 m sprint (s)** – acceleration speed
- ✓ **20 m sprint (s)** – maximal speed



- ✓ **Illinois Agility Test (s)** – agility and direction change
- ✓ **Reaction Time Test (ms)** – using digital reaction device
- ✓ **Standing Long Jump (cm)** – as an explosive leg power indicator

Tests were conducted **before and after** the intervention.

Data Analysis

Data were analyzed using Microsoft Excel and SPSS 25.0. Descriptive statistics (mean \pm SD) and paired-sample t-tests were used to determine significance. Statistical significance was set at **p < 0.05**.

Results

Table 1. Pre- and post-test results of speed development indicators (n = 30)

Test	Pre-Test Mean \pm SD	Post-Test Mean \pm SD	% Change	p- value
10 m Sprint (s)	2.21 \pm 0.15	1.98 \pm 0.12	-10.4%	0.001
20 m Sprint (s)	4.08 \pm 0.25	3.72 \pm 0.19	-8.8%	0.002
Illinois Agility (s)	17.45 \pm 1.05	15.92 \pm 0.83	-8.7%	0.004
Reaction Time (ms)	295 \pm 31	257 \pm 26	-12.8%	0.000
Standing Long Jump (cm)	186.2 \pm 12.7	199.4 \pm 13.3	+7.1%	0.008

Scientific Interpretation:

- ❖ The **10m and 20m sprints** showed significant improvements, indicating enhanced **acceleration and top-end speed** due to repeated short bursts in relay games.
- ❖ The **Illinois agility test** improved due to rapid change-of-direction activities during games.
- ❖ **Reaction time** showed the highest improvement, attributed to unpredictable cues in games such as Chillak and mini tag, where players must react instantly to visual and auditory signals.





- ❖ **Standing long jump** increased due to plyometric-like movements in national games, promoting **explosive leg strength**.

Table 2. Gender-based comparison of improvements

Test	Boys (% change)	Girls (% change)	Significant Difference (p)
10 m Sprint	-10.8%	-9.9%	0.21
20 m Sprint	-9.1%	-8.5%	0.27
Illinois Agility	-8.9%	-8.4%	0.33
Reaction Time	-13.2%	-12.4%	0.19
Standing Long Jump	+7.8%	+6.4%	0.22

Scientific Interpretation:

- Both boys and girls benefited similarly, suggesting that the method is **equally effective across genders**.
- No statistically significant gender difference was found, confirming the **universal applicability** of the method.

Table 3. Weekly progression of average 10m sprint times (s)

Week	Avg 10m Sprint (s)
Week 1	2.21
Week 2	2.17
Week 3	2.12
Week 4	2.09
Week 5	2.06
Week 6	2.03
Week 7	2.01
Week 8	1.98





Scientific Interpretation:

- There is a **steady improvement** across all 8 weeks.
- The progressive enhancement highlights the **cumulative impact** of consistent exposure to speed-oriented games.

Discussion

This research provides clear evidence that **national movement and relay games** can be **highly effective in developing speed qualities** in young volleyball players. The greatest improvements were observed in reaction time and acceleration—crucial for volleyball actions such as blocking, diving, and spiking.

Cultural Relevance and Motivation

Involving national games boosts motivation and **cultural identity**, which is critical during adolescence. These games are **emotionally engaging**, increasing **compliance and enjoyment**, thus enhancing training effectiveness.

Motor Learning

The variety and spontaneity involved in national games **enhance neural adaptation**, improving reaction and decision-making speed under game-like conditions. This type of **functional speed training** is more transferable to volleyball than isolated sprint drills.

Application in Volleyball Training

- ✓ Coaches can integrate **15–20 minutes of national relay games** into warm-ups or conditioning.
- ✓ These activities act as **multi-faceted drills**, addressing speed, agility, and coordination simultaneously.

Limitations and Future Research

- ✓ The study was conducted over 8 weeks; longer periods could yield more pronounced differences.
- ✓ Future studies could involve a **control group** to compare traditional versus game-based training more precisely.



- ✓ Psychological and emotional responses to national games could be assessed to quantify motivational benefits.

Conclusion

The use of national movement and relay games significantly enhanced the **speed-related physical qualities** in 15–16-year-old volleyball players. This culturally integrated method not only improves sprinting, agility, and reaction but also increases motivation and enjoyment. Sports schools and volleyball sections are encouraged to implement such holistic training approaches.

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