Physical Education Theory and Methodology
Теорія та методика фізичного виховання

ISSN 1993-7989 (print)
ISSN 1993-7997 (online)
ISSN-L 1993-7989

Original Scientific Articles. Training Effects and Experimental Design

The Effect of 6-Weeks of SAQ Training on the Speed and Agility Parameters of U-18 Female Soccer Players

Slamet Raharjo[1ABCD], Mahmud Yunus[1ABCD], Raja Mohammed Firhad Raja Azidin[2ACD] and Eggy Nur Arfiansyah[3BCD]

[1]State University of Malang
[2]Universiti Teknologi MARA
[3]Yogyakarta State University

Authors' Contribution: A – Study design; B – Data collection; C – Statistical analysis; D – Manuscript Preparation; E – Funds Collection

Corresponding Author: Slamet Raharjo, e-mail: slamet.raharjo.fik@um.ac.id
Accepted for Publication: July 14, 2026
Published: July 28, 2026

DOI: 10.17309/tmfv.2026.4.12

Abstract

Objectives. To determine whether a six-week Speed, Agility, and Quickness (SAQ) training programme improves linear sprint performance and change-of-direction ability in adolescent female soccer players.

Materials and Methods. This randomized controlled trial included 48 adolescent female soccer players (mean age: 17 years), who were randomly assigned to either an SAQ training group (n = 24) or a control group (n = 24). Both groups completed three training sessions per week over a six-week intervention period. Linear sprint performance was assessed using the 30-m sprint test, and change-of-direction ability was evaluated using the Illinois Agility Test. Measurements were performed before and after the intervention.

Results. No significant between-group differences were observed at baseline for any study variable (all $p > 0.05$). Following the intervention, significant group × time interactions were found for both 30-m sprint performance and Illinois Agility Test performance (both $p < 0.05$). Compared with the control group, the SAQ group demonstrated significantly greater improvements in sprint and agility performance. A modest but statistically significant improvement in 30-m sprint performance was also observed in the control group, whereas agility performance remained unchanged.

Conclusions. A six-week SAQ training programme effectively improves linear sprint performance and change-of-direction ability in adolescent female soccer players. Incorporating structured SAQ exercises into regular soccer training provides greater improvements in these performance characteristics than conventional soccer training alone and may therefore be recommended as an effective component of physical conditioning programmes for youth female soccer players.

Keywords: adolescent female soccer players, speed, agility and quickness, sprint performance, change-of-direction ability, soccer training.

Introduction

Soccer performance is determined by the ability to repeatedly execute high-intensity actions interspersed with periods of lower-intensity activity throughout a 90-minute match. Success in competitive play depends not only on technical and tactical proficiency but also on the capacity to accelerate, decelerate, sprint, rapidly change direction, and perform explosive sport-specific actions under conditions of accumulated fatigue (Stølen et al., 2005; Bangsbo, 2014). Consequently, modern conditioning programmes increasingly emphasise the development of neuromuscular qualities that enable players to sustain repeated high-intensity efforts during competition (Sporiš et al., 2011).

In women's soccer, the physical demands have increased substantially with the continuing professionalisation of the sport. Match play requires frequent accelerations, maximal and near-maximal sprints, multidirectional movements, jumping, tackling, and ball-related technical actions performed at varying intensities (Drust et al., 2007). Previous investigations have identified sprint performance, change-of-direction ability, agility, explosive lower-limb

power, and aerobic fitness as key determinants of successful performance in female players (Faude et al., 2012; Zouhal et al., 2021). These physical capacities are interrelated and require systematic training approaches capable of simultaneously improving movement efficiency and sport-specific performance (Buchheit et al., 2018; Horníková & Zemková, 2021).

Among contemporary conditioning methods, Speed, Agility, and Quickness (SAQ) training has gained considerable attention because it integrates linear sprinting, multidirectional movement patterns, acceleration, deceleration, coordination, and reactive motor tasks within a single training framework (Pearson, 2001). Rather than targeting isolated physical qualities, SAQ training aims to enhance the neuromuscular mechanisms underlying rapid movement execution, efficient transitions between movement patterns, and effective control of body position during high-speed actions (Trecroci et al., 2022). Such characteristics make this approach particularly suitable for intermittent team sports, where repeated changes in movement direction and velocity are fundamental components of match performance.

Growing evidence indicates that SAQ-based interventions can improve several performance-related variables in soccer players. Positive adaptations have been reported for sprint acceleration, maximal running speed, change-of-direction performance, reactive ability, and explosive power following structured training programmes lasting between six and twelve weeks (Jovanovic et al., 2011; Milanović et al., 2013; Azmi & Kusnanik, 2018; Formenti et al., 2021). Nevertheless, most available evidence has been obtained from male athletes or mixed populations, whereas comparatively few investigations have specifically examined highly trained female soccer players. Moreover, differences in physiological characteristics, neuromuscular function, and training adaptations suggest that findings derived from male cohorts cannot be directly generalised to female athletes (McKay et al., 2022).

Although previous studies have demonstrated beneficial effects of SAQ training in female youth soccer players (Mathisen & Pettersen, 2015), the available evidence remains limited with respect to intervention duration, competitive level, and regional training environments. Additional research is therefore warranted to clarify the effectiveness of short-term SAQ programmes implemented within regular training schedules for female players competing at the university level.

Accordingly, the purpose of this study was to examine the effects of a six-week SAQ training programme on sprint performance and agility in female soccer players. It was hypothesised that integrating SAQ training into the regular training programme would produce significant improvements in linear sprint performance and agility compared with conventional soccer training.

Materials and Methods

Participants

Forty-eight amateur female soccer players (mean ± SD: 17.4 ± 1.5 years) voluntarily participated in this randomized controlled trial. An a priori sample size calculation indicated that at least 17 participants were required to detect meaningful differences between groups with adequate statistical power. Eligible participants were required to be between 16 and 18 years of age, have accumulated a minimum of two years of competitive soccer experience, be free from musculoskeletal injury during the previous six months, and regularly participate in organized training and official competition.

Before enrolment, all participants received verbal and written information regarding the study objectives, experimental procedures, and potential risks. Written informed consent was obtained from each participant before data collection. The study protocol was approved by the Sports Science Ethics Committee of Malang State University (Approval No. 22.1.18/UN32.6.1/2025) and conducted in accordance with the principles of the Declaration of Helsinki.

Study Design

A parallel-group randomized controlled design was employed to determine the effects of a six-week Speed, Agility, and Quickness (SAQ) training programme on sprint and agility performance. Following baseline testing, participants were randomly assigned in a 1:1 ratio to either an experimental SAQ group (n = 24) or a control group (n = 24).

Physical performance was evaluated before and immediately after completion of the intervention using two standardized field tests: the 30-m linear sprint test and the Illinois Agility Test. The primary outcome variables were sprint time over 30 m and agility completion time.

Experimental Procedures

The intervention was conducted over six consecutive weeks on a regulation outdoor natural-grass soccer field (90 × 120 m). Training and testing sessions were scheduled between 15:30 and 17:30 h under the supervision of experienced soccer coaches holding continental coaching qualifications.

Prior to the experimental period, participants completed familiarization sessions to ensure consistent execution of all testing procedures and training drills. Soccer boots were worn during every training and testing session. Participants were instructed to maintain their habitual nutritional practices, daily routines, and regular physical activity outside the study in order to minimize the influence of external factors on training adaptations.

Training Intervention

Both groups completed three supervised training sessions per week in addition to their regular soccer practice. The experimental group performed a progressive SAQ programme specifically designed to develop acceleration, multidirectional speed, reactive agility, and movement coordination, whereas the control group completed conventional sprint and zigzag running exercises matched for overall training volume.

Training intensity increased progressively throughout the intervention, beginning at approximately 80% of maximal effort during Weeks 1–2, increasing to approximately 90% during Weeks 3–4, and reaching maximal intensity during Weeks 5–6. Coaches continuously monitored exercise

Table 1. Training program

Grup	Week 1-2 Intensity 80%	Week 3-4 Intensity 90%	Week 5-6 Intensity 100%
SAQ	Speed Wall Drill 3 Count–A Skip, A Run, and B Run COD Speed Hop Scotch Agility Ladder Drill	Speed Speed Ladder Drill Speed Training Band COD speed Agility Ladder Drill Reactive Agility Tictac Toe Game	Speed Speed Hurdle Drill COD speed Slalom Sprint Agility Hurdle Drill Reactive Agility Relay race game
Control Grup	Sprint 15m Zig-Zag Sprint	Sprint 20m Zig-Zag Sprint	Sprint 25m Zig-Zag Sprint
General Training	Passing Exercise Small Sided Game 4v4 5min x 2 (30 x 40m)	Passing Exercise Small Sided Game 4v4 with mini goal 5min x 2 (30 x 40m) Finishing drill	Passing Exercise Small Sided Game 4v4+3N 5min x 2 (30 x 40m) Finishing drill

Note: all groups did general training after the intervention exercises in each group.

execution to ensure that the prescribed intensity was achieved.

Each exercise consisted of three sets of four repetitions separated by 90 s of passive recovery, while a 3-min recovery interval was provided between different drills. After completion of the experimental or control intervention, both groups participated in identical soccer-specific training sessions that included technical exercises, tactical drills, small-sided games, and finishing practice. Consequently, the principal difference between groups was limited to the conditioning component of the training programme.

Performance Testing

30-m Sprint Test

Linear sprint performance was assessed using a maximal 30-m sprint test. Participants started from a stationary standing position immediately behind the starting line and were instructed to complete the distance as rapidly as possible. Sprint time was measured to the nearest 0.01 s using a digital stopwatch (CASIO HS-70W, Tokyo, Japan). Two maximal trials were performed with sufficient passive recovery between attempts, and the fastest performance was retained for statistical analysis.

Illinois Agility Test

Change-of-direction ability was evaluated using the standardized Illinois Agility Test. Participants completed the established running course beginning from the prescribed starting position before negotiating the sequence of directional changes around and between the cones until crossing the finish line. Performance time was recorded using an electronic timing system. Two trials were completed under identical testing conditions, and the shortest completion time was used for subsequent analyses.

Statistical Analysis

Statistical analyses were performed using IBM SPSS Statistics (Version 26.0; IBM Corp., Armonk, NY, USA). Descriptive statistics are presented as mean ± standard deviation.

Before inferential analyses, data distribution was examined using the Shapiro–Wilk test, whereas homogeneity of variance was assessed using Levene's test. Because measurements were obtained at only two time points (pre- and post-intervention), assessment of the sphericity assumption was unnecessary.

Intervention effects were evaluated using a two-way mixed-design analysis of variance (ANOVA) with one between-subject factor (group: SAQ vs. control) and one within-subject factor (time: pre vs. post). The interaction between group and time represented the principal outcome of interest. When appropriate, between-group differences following the intervention were examined using independent-samples t-tests. For variables violating the assumption of homogeneity of variance, the Mann–Whitney U test was applied.

Effect sizes were quantified using Hedges' g, whereas Cohen's d was reported where appropriate to facilitate interpretation of mean differences. Effect sizes were interpreted according to Hopkins et al. (2009) as trivial (<0.20), small (0.20–0.59), moderate (0.60–1.19), large (1.20–1.99), very large (2.00–3.99), and nearly perfect (≥4.00). Statistical significance was established at $p < 0.05$.

Results

Baseline comparisons showed no significant differences between the SAQ and control groups for anthropometric characteristics or performance variables before the intervention (all $p > 0.05$), indicating comparable baseline characteristics. Following the six-week intervention, significant between-group differences were observed for both sprint and agility performance ($p < 0.05$) (Table 2).

Table 2. Descriptive statistics

Variables	SAQ	Control Grup	p-value
	M ± SD	M ± SD	
Height (cm)	154.7 ± 4.0	153.7 ± 4.1	0.998
Weight (kg)	52.3 ± 5.6	51.7 ± 5.4	0.998
BMI	21.9 ± 2.1	21.7 ± 2.0	0.998
Pre-test Sprint 30m (s)	5.7 ± 0.4	5.8 ± 0.4	0.727
Post-test Sprint 30m (s)	4.7 ± 0.3	5.7 ± 0.4	0.000*
Pre-test Illinois agility test (s)	19.1 ± 0.9	19.2 ± 0.9	0.695
Post-test Illinois agility test (s)	17.9 ± 1.1	19.1 ± 0.9	0.000*

Note:*significance p<0.05

Table 3. Inter-group analysis

Variables	Group	n	Pre-Test	Post-test	Independent-t	Group	Time
			M ± SD	M ± SD		p-value	Partial η^2
Sprint 30 m (s)	SAQ	24	5.7 ± 0.4	4.7 ± 0.3	0.001*	0.001*	0.79
	CG	24	5.8 ± 0.4	5.7 ± 0.4			
Illinois Agility (s)	SAQ	24	19.1 ± 0.9	17.9 ± 1.1	0.000*	0.001*	0.64
	CG	24	19.2 ± 0.9	19.1 ± 0.9			

Note: *significance p<0.05

Sprint Performance

A significant group × time interaction was observed for the 30-m sprint (p = 0.001, partial η^2 = 0.79), indicating that changes in sprint performance differed between the experimental and control groups (Table 3). Within-group analysis demonstrated a significant reduction in sprint time in the SAQ group after the intervention (p = 0.001), whereas only a small improvement was observed in the control group (p = 0.049). Post-intervention comparisons confirmed significantly faster sprint performance in the SAQ group than in the control group (p = 0.001).

Agility Performance

For the Illinois Agility Test, a significant group × time interaction was also identified (p = 0.001, partial η^2 = 0.64) (Table 3). Within-group analysis revealed a significant reduction in completion time in the SAQ group (p = 0.001), whereas no statistically significant change was observed in the control group (p = 0.102). Between-group comparisons at post-test demonstrated significantly better agility performance in the SAQ group than in the control group.

Table 4. Group analysis

Variables	Group	n	Pre vs Post	Percentage of improvement Δ%	Hedges' g
Sprint 30m (s)	SAQ	24	0.001*	17.5	2.7
	CG	24	0.049*	1.7	0.3
Illinois Agility (s)	SAQ	24	0.001*	6.2	1.2
	CG	24	0.102	0.5	0.1

Note: *significance p<0.05

The magnitude of performance improvements was greater in the SAQ group than in the control group (Table 4). Sprint time improved by 17.5% in the SAQ group compared with 1.7% in the control group, corresponding to a very large effect size (Hedges' g = 2.7). Similarly, Illinois Agility Test performance improved by 6.2% in the SAQ group (Hedges› g = 1.2), whereas only minimal changes were observed in the control group.

Discussion

The present randomized controlled study investigated the effects of a six-week Speed, Agility, and Quickness (SAQ) training programme integrated into regular soccer practice in young amateur female players. The principal finding was that participants who completed the SAQ intervention demonstrated significantly greater improvements in sprint performance and multidirectional agility than those following conventional training alone. These findings indicate that incorporating structured SAQ exercises into routine soccer practice provides an effective stimulus for enhancing physical qualities that are directly associated with match performance.

The improvements observed in the experimental group appear to be primarily related to the specificity of the training stimulus. The SAQ programme combined acceleration drills, multidirectional running, resisted sprinting, agility ladder exercises, hurdle drills, and rapid transition tasks, requiring repeated execution of explosive movements under progressively increasing intensity. Such training conditions are known to improve movement efficiency by enhancing intermuscular coordination, motor-unit recruitment, and the rate of force development during high-speed actions. Since the participants had not previously undertaken a systematic SAQ programme, the introduction of these novel neuromuscular stimuli may have accelerated the early adaptive response, contributing to the substantial improvements observed after only six weeks of training.

Particular attention should be given to the improvement in 30-m sprint performance. Although the magnitude of change exceeded that commonly reported in longitudinal studies involving trained athletes, several factors may explain this response. The players had competitive experience but limited exposure to structured speed-oriented conditioning. Consequently, exercises such as wall drills, resisted sprinting, agility ladders, and hurdle coordination drills likely provided a sufficiently novel overload stimulus to optimise sprint mechanics and movement efficiency. Nevertheless, because large improvements over a relatively short intervention should be interpreted cautiously, future investigations using larger samples and fully automated electronic timing systems are required to confirm the reproducibility of these findings.

The present results are generally consistent with previous studies reporting positive effects of SAQ training on sprint performance and change-of-direction ability in soccer players (Jovanovic et al., 2011; Milanović et al., 2013; Anwer et al., 2021). However, the current study extends existing evidence by focusing specifically on adolescent female soccer players, a population that remains underrepresented in the literature. Given documented sex-related differences in neuromuscular characteristics and movement biomechanics, training recommendations should increasingly rely on evidence obtained from female athletes rather than extrapolating findings from male cohorts.

From a physiological perspective, the observed adaptations are consistent with the neuromuscular responses

expected following explosive movement training. Repeated accelerations, decelerations, cutting manoeuvres, and rapid changes of direction stimulate the stretch-shortening cycle, increase motor-unit synchronization, improve intermuscular coordination, and enhance the rate of force development. These adaptations reduce ground-contact time during sprinting while improving force transmission during rapid directional changes, thereby contributing to faster linear running and more efficient multidirectional movement. Previous research has similarly highlighted the importance of these mechanisms for improving high-speed athletic performance (Baechle & Earle, 2008; Radnor et al., 2018; Sun et al., 2025).

Beyond statistical significance, the present findings also have practical relevance. In soccer, successful performance frequently depends on the ability to repeatedly accelerate, decelerate, and rapidly reposition in response to continuously changing tactical situations. Improvements in linear sprint capacity may increase the ability to reach loose balls, create offensive space, and recover defensively, whereas enhanced multidirectional agility facilitates more efficient execution of technical and tactical actions performed under time pressure. Consequently, simultaneous improvements in sprinting and agility may provide a meaningful competitive advantage during repeated high-intensity phases of match play.

An important feature of the intervention is its high degree of movement specificity. Unlike traditional conditioning programmes that often develop endurance and strength separately, the SAQ approach integrates sprinting, directional changes, coordination, balance, and reactive movement patterns within a single training session. Such an integrated stimulus closely reflects the movement demands of competitive soccer and may therefore promote greater transfer of training adaptations to on-field performance. These observations support previous recommendations advocating a greater emphasis on multidirectional speed development within long-term soccer training programmes.

Several limitations should be acknowledged. First, the sample consisted exclusively of young amateur female soccer players from a single competitive level, which limits the generalizability of the findings to other age groups and playing standards. Second, potentially influential factors such as menstrual cycle phase, previous injury history, and biological maturation were not incorporated into the experimental design. Third, although the study demonstrated significant improvements in performance variables associated with athletic development, it did not evaluate injury incidence or biomechanical risk factors during competition. Future studies should therefore include larger multicentre samples, longer intervention periods, biomechanical analyses, and prospective injury surveillance to further clarify both the mechanisms and long-term practical significance of SAQ training.

In conclusion, the findings demonstrate that integrating a structured six-week SAQ programme into regular soccer training represents an effective strategy for improving sprint performance and multidirectional agility in adolescent female players. Because the programme requires relatively simple equipment and can be readily incorporated into routine practice, it provides coaches and strength and conditioning specialists with a practical, evidence-based approach for enhancing movement quality during high-intensity match situations.

Conclusions

A six-week Speed, Agility, and Quickness (SAQ) training programme integrated into regular soccer practice produced meaningful improvements in sprint performance and multidirectional agility in adolescent female soccer players. The findings indicate that SAQ training provides a more effective stimulus for developing high-intensity movement capabilities than conventional conditioning alone. Given its practical feasibility and minimal equipment requirements, SAQ training may be recommended as an effective component of physical preparation programmes for youth female soccer players. Future studies should verify these findings in larger cohorts and examine whether the observed performance gains are maintained over longer training periods and translate into improved competitive performance and reduced injury risk.

Ethics Approval

The study protocol was reviewed and approved by the Sports Science Ethics Committee of Malang State University (Approval No. 22.1.18/UN32.6.1/2025). All procedures were conducted in accordance with the ethical principles of the Declaration of Helsinki.

Informed Consent

Written informed consent was obtained from all participants prior to their enrolment in the study.

Data Availability Statement

The datasets generated during the current study are not publicly available because of ethical and privacy restrictions.

AI Transparency Statement

Artificial intelligence-assisted tools were used exclusively to improve the linguistic quality of the manuscript. The authors retained full responsibility for the study design, data analysis, interpretation of the findings, and the final content of the manuscript.

Funding

This research received no external funding.

Acknowledgements

Not applicable.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

References

Stølen, T., Chamari, K., Castagna, C., & Wisløff, U. (2005). Physiology of soccer: An update. *Sports Medicine, 35*(6), 501–536. https://doi.org/10.2165/00007256-200535060-00004

Bangsbo, J. (2014). Physiological demands of football. *Sports Science Exchange, 27*(125), 1–6.

Sporiš, G., Milanović, Z., Trajković, N., & Joksimović, A. (2011). Correlation between speed, agility and quickness (SAQ) in elite young soccer players. *Acta Kinesiologica, 5*(2), 36–41.

Drust, B., Atkinson, G., & Reilly, T. (2007). Future perspectives in the evaluation of the physiological demands of soccer. *Sports Medicine, 37*(9), 783–805. https://doi.org/10.2165/00007256-200737090-00003

Faude, O., Koch, T., & Meyer, T. (2012). Straight sprinting is the most frequent action in goal situations in professional football. *Journal of Sports Sciences, 30*(7), 625–631. https://doi.org/10.1080/02640414.2012.665940

Zouhal, H., Coppalle, S., Ravé, G., Dupont, G., Jan, J., Tourny, C., & Ahmaidi, S. (2021). High-level football: Physical and physiological analysis—Injury and prevention. *Science & Sports, 36*(4), 332–357. https://doi.org/10.1016/j.scispo.2021.03.001

Buchheit, M., Modunotti, M., Stafford, K., Gregson, W., & Di Salvo, V. (2018). Match running performance in professional soccer players: Effect of match status and goal difference. *Sport Performance & Science Reports, 1*(21), 1–3.

Horníková, H., & Zemková, E. (2021). Relationship between physical factors and change of direction speed in team sports. *Applied Sciences, 11*(2), 655. https://doi.org/10.3390/app11020655

Pearson, A. (2001). *Speed, agility and quickness for soccer.* A & C Black.

Trecroci, A., Cavaggioni, L., Rossi, A., Moriondo, A., Merati, G., Nobari, H., Ardigò, L. P., & Formenti, D. (2022). Effects of speed, agility and quickness training programme on cognitive and physical performance in preadolescent soccer players. *PLOS ONE, 17*(12), e0277683. https://doi.org/10.1371/journal.pone.0277683

Jovanovic, M., Sporis, G., Omrcen, D., & Fiorentini, F. (2011). Effects of speed, agility, quickness training method on power performance in elite soccer players. *Journal of Strength and Conditioning Research, 25*(5), 1285–1292. https://doi.org/10.1519/JSC.0b013e3181d67c65

Milanović, Z., Sporiš, G., Trajković, N., James, N., & Šamija, K. (2013). Effects of a 12-week SAQ training programme on agility with and without the ball among young soccer players. *Journal of Sports Science & Medicine, 12*(1), 97–103.

Azmi, K., & Kusnanik, N. W. (2018). Effect of exercise program speed, agility, and quickness (SAQ) in improving speed, agility, and acceleration. *Journal of Physics: Conference Series,* 947, 012043. https://doi.org/10.1088/1742-6596/947/1/012043

Formenti, D., Rossi, A., Bongiovanni, T., Campa, F., Cavaggioni, L., Alberti, G., Longo, S., & Trecroci, A. (2021). Effects of non-sport-specific versus sport-specific training on physical performance and perceptual response in young football players. *International Journal of Environmental Research and Public Health, 18*(4), 1962. https://doi.org/10.3390/ijerph18041962

McKay, A. K. A., Stellingwerff, T., Smith, E. S., Martin, D. T., Mujika, I., Goosey-Tolfrey, V. L., Sheppard, J., & Burke, L. M. (2022). Defining training and performance caliber: A participant classification framework. *International Journal of Sports Physiology and Performance, 17*(2), 317–331. https://doi.org/10.1123/ijspp.2021-0451

Mathisen, G. E., & Pettersen, S. A. (2015). The effect of speed training on sprint and agility performance in female youth soccer players. *Journal of Physical Education and Sport, 15*(3), 395–399. https://doi.org/10.7752/jpes.2015.03059

Hopkins, W. G., Marshall, S. W., Batterham, A. M., & Hanin, J. (2009). Progressive statistics for studies in sports medicine and exercise science. *Medicine & Science in Sports & Exercise, 41*(1), 3–13. https://doi.org/10.1249/MSS.0b013e31818cb278

Anwer, U., Nuhmani, S., Sharma, S., Bari, M. A., Kachanathu, S. J., & Abualait, T. S. (2021). Efficacy of speed, agility and quickness training with and without equipment on athletic performance parameters: A randomized control trial. *International Journal of Human Movement and Sports Sciences, 9*(2), 194–202. https://doi.org/10.13189/saj.2021.090205

Baechle, T. R., & Earle, R. W. (Eds.). (2008). *Essentials of strength training and conditioning* (3rd ed.). Human Kinetics.

Radnor, J. M., Oliver, J. L., Waugh, C. M., Myer, G. D., Moore, I. S., & Lloyd, R. S. (2018). The influence of growth and maturation on stretch-shortening cycle function in youth. *Sports Medicine, 48*(1), 57–71. https://doi.org/10.1007/s40279-017-0785-0

Sun, M., Soh, K. G., Ma, S., Wang, X., Zhang, J., & Yaacob, A. B. (2025). Effects of speed, agility, and quickness (SAQ) training on soccer player performance: A systematic review and meta-analysis. *PLOS ONE, 20*(2), e0316846. https://doi.org/10.1371/journal.pone.0316846

Вплив шеститижневої програми тренувань швидкості, спритності та швидкості реагування (SAQ) на показники швидкості та спритності футболісток віком до 18 років

Сламет Рахарджо[1ABCD], Махмуд Юнус[1ABCD], Раджа Мохаммед Фірхад Раджа Азідін[2ACD], Еггі Нур Арфіансьях[3BCD]

[1]Державний університет Маланга
[2]Університет технологій MARA
[3]Державний університет Джок'якарти

Авторський вклад: A – дизайн дослідження; B – збір даних; C – статаналіз; D – підготовка рукопису; E – збір коштів

Реферат. Стаття: 7 с., 4 табл., 21 джерело.

Мета. Визначити, чи покращує шеститижнева програма тренування швидкості, спритності та швидкості реагування (SAQ) показники лінійного спринту та здатності до зміни напрямку руху в дівчат-підлітків, які займаються футболом.

Матеріали та методи. У рандомізованому контрольованому дослідженні взяли участь 48 дівчат-підлітків, які займаються футболом (середній вік – 17 років). Учасниць випадковим чином розподілили на групу SAQ-тренувань (n = 24) та контрольну групу (n = 24). Обидві групи тренувалися тричі на тиждень протягом шести тижнів. Лінійну швидкість оцінювали за допомогою тесту бігу на 30 м, а здатність до зміни напрямку руху – за допомогою тесту спритності Іллінойса (Illinois Agility Test). Вимірювання проводили до та після завершення програми втручання.

Результати. На початку дослідження між групами не виявлено статистично значущих відмінностей за жодним із досліджуваних показників (усі $p > 0,05$). Після завершення програми встановлено статистично значущу взаємодію факторів «група × час» як для результатів бігу на 30 м, так і для тесту спритності Іллінойса (в обох випадках $p < 0,05$). Порівняно з контрольною групою учасниці групи SAQ продемонстрували значно більше покращення показників швидкісного бігу та спритності. У контрольній групі також відзначено незначне, але статистично значуще покращення результатів бігу на 30 м, тоді як показники спритності залишилися без змін.

Висновки. Шеститижнева програма SAQ-тренувань ефективно покращує показники лінійного спринту та здатності до зміни напрямку руху в дівчат-підлітків, які займаються футболом. Включення структурованих SAQ-вправ до регулярного тренувального процесу забезпечує більш виражене покращення цих фізичних якостей порівняно зі звичайними футбольними тренуваннями, тому може бути рекомендоване як ефективний компонент програм фізичної підготовки юних футболісток.

Ключові слова: дівчата-підлітки, які займаються футболом, швидкість, спритність і швидкість реагування (SAQ), спринтерська швидкість, здатність до зміни напрямку руху, футбольне тренування.

Information about the Authors:

Raharjo, Slamet: slamet.raharjo.fik@um.ac.id; https://orcid.org/0000-0002-0708-867X; Departement of Sport Science, State Univeristy of Malang, Malang, Indonesia.

Yunus, Mahmud: mahmud.yunus.fik@um.ac.id; https://orcid.org/0000-0001-8677-3837; Departement of Sport Science, State Univeristy of Malang, Malang, Indonesia.

Raja Azidin, Raja Mohammed Firhad: firhad@uitm.edu.my; https://orcid.org/0000-0003-4770-2870; Faculty of Sport Science and Recreation, Universiti Teknologi MARA, Selangor, Malaysia.

Arfiansyah, Eggy Nur: eggynur.2024@student.uny.ac.id; https://orcid.org/0009-0000-5338-1597; Departement of Sport Science, Yogyakarta State University, Yogyakarta, Indonesia.

Cite this article as: Raharjo, S., Yunus, M., Raja Azidin, R. M. F., & Arfiansyah, E. N. (2026). The Effect of 6-Weeks of SAQ Training on the Speed and Agility Parameters of U-18 Female Soccer Players. *Physical Education Theory and Methodology, 26*(4), 782-788. https://doi.org/10.17309/tmfv.2026.4.12

Received: 30.06.2026. Accepted: 14.07.2026. Published: 28.07.2026