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The Effect of Elastic Resistance Band Training on Developing Muscular Power and Reactive Agility in Under-18 Basketball Players

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Abstract

The study aimed to identify the effect of elastic resistance band training on developing lower- and upper-limb muscular power and reactive agility among under-18 basketball players. The experimental method was used with a pre- and post-test design for two equivalent groups (experimental and control). Twelve Al-Defaa Al-Jawiy volleyball players were randomly assigned into two groups of six individuals. The experimental group underwent an 8-week training program using elastic resistance bands, with a frequency of three times per week, independent of the traditional intervention applied to the control group. Strength of the lower-limb musculature was assessed by vertical jumping, strength of the upper-limb musculature by medicine ball throwing and reactive agility using visual reaction time testing. The post-test results showed statistically significant differences that favored the experimental group in all research variables and exhibited a tendency of muscular power and reactive agility improvements when compared with the control group. It was founding that elastic resistance band training can be an effective and safe way to develop these physical abilities associated with skill performance in youth basketball due to its generation of the progressive resistance, which contributes to the neuromuscular benefits and movement efficiency.

Keywords: elastic resistance bands, muscular power, reactive agility, basketball, youth players.

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Introduction

Basketball is one of the most dynamic and high-intensity team sports that demands advanced levels of physical, neuromuscular and perceptual capabilities in order to execute successfully under constantly changing game scenarios. Two of the most important influences on match performance in youth basketball are increasing muscular power and enhancing reactive agility as these can help young players directly with sprinting, jumping, defensive transitions, and rapid decision-making during competitive play. Indeed, current sports science has stressed the importance of integrating strength training with perceptual-motor training to reach maximum performance effects in open-skill sports such as basketball (Sacot et al., 2022).

Reactive agility is defined as the ability of an individual to redirect his or her body in response to a stimulus and forms part of a complex interrelationship between cognitive tasks, neuromuscular coordination and biomechanical performance. In basketball, such an ability is of paramount importance as offensive and defensive actions develop unpredictably and players must react at the cognitive level based on information gathered from the eye. In youth basketball players, large effects in multidirectional speed, jumping performance and agility have been found when comparing neuromuscular training versus control (Sacot et al., 2022; Hassan & Abdulkareem, 2025).

Highly explosive muscular power in both the leg and arm muscles also contribute to basketball performance. It has a direct bearing on vertical jump, rebounding ability, shooting skill, sprint acceleration and defensive effort. Explosive strength indicators are significantly improved by resistance training in adolescent basketball players sharing the view that no damage is caused to their physical development and health (Santos & Janeira, 2012). In addition, organized strength training programs are important in enhancing rate of force development and sport-specific performance (Zhu et al., 2024; Abdulghani et al., 2025).

Elastic resistance band training has gained popularity as a practical and effective modality in strength and conditioning programs in current times. They exert variable resistance which grows with stretching and thus athletes can feel the effect of progressive loading across the entire range of motion, influencing neuromuscular activity patterns (Stanković et al., 2025; Amer & Al-juboori, 2024). A mechanical load of this type is compatible with the so-called strength curve of muscles, and may more potently stimulate force production, as well as coordination, compared to constant-load resistance training in certain situations (Ferreira et al., 2025; Hassan & Abdulkareem, 2026).

Increasing evidence from literature has endorsed the beneficial effects of elastic resistance band training in enhancing performance related physical characteristics. In a systematic review and meta-analysis with team-sport athletes, the authors of that study concluded that there would be likely changes in lower-limb explosive power, change-of-direction performance, and sprint time after elastic band training interventions (Stanković et al., 2025). Furthermore, experimental studies have demonstrated that resistance band exercises are effective in improving muscle strength and functional performances of young athletes (Granacher et al., 2016).

Sport-specific elastic band training has also shown positive effects designed for basketball players. Studies have shown that resistance band training can stimulate the increase of arm leg muscular power, passing improvement, and shooting from a farther distance while increasing basketball players overall performance as well as beneficial to rebounding actions (Mulya & Kusdinar, 2025). Furthermore, complex elastic band training sessions have proven to be effective in physical performance factors like strength, agility and speed during controlled periods of development (Naclerio et al., 2013).

Elastic resistance training exercises also seem to be effective in improving multidirectional speed and movement efficiency, which have a high correlation with reactive agility. Short-term interventions with elastic band sidestep exercises have achieved meaningful enhancements in multidirectional sprint performance, suggesting a potential for agility development (Núñez-González et al., 2025). These results support the implementation of resistance band training into sport-specific conditioning models aimed at enhancing physical and reactive performance characteristics.

Although increasing amount of research on resistance training, few studies have investigated the effects of elastic resistance band training on muscular power and reactive agility in male adolescent basketball players. Much of the available literature has also examined only strength, sprint, or general agility characteristics in isolation without exploring the relationship between neuromuscular power production and reactive movement responses within a basketball-specific setting (Sousa et al., 2025).

Additionally, these interventions were particularly effective due to the rapid evolution of neuromuscular adaptations during adolescence when strength training is focused. Safe and versatile training tools such as elastic bands are particularly appropriate for this population, enabling progressive loading with minimum amount of mechanical stress while stimulating coordination and functional movement patterns (Coşkun 2025; Kumar & Amer, 2024).

When it comes to basketball training for youth, most programs only use traditional and often outdated strength exercises to prepare young athletes for playing time. Although the use of elastic resistance band training is increasing within strength and conditioning, to our knowledge little is known about their simultaneous effect on these two performance variables in U18 basketball players with a clear research gap for evidence-based practice.

Research Objectives

1. Identify the effect of elastic resistance band training on muscular power in under-18 basketball players.
2. Determine its effect on reactive agility.
3. Compare post-test results between experimental and control groups.

Research Hypotheses

1. Elastic resistance band training positively affects muscular power and reactive agility in under-18 basketball players.
2. Significant improvements will appear in post-tests for the experimental group.
3. Post-test results will favor the experimental group over the control group.

So, examining the possibility of the utilization of elastic resistance band training in improving muscular power and reactive agility amongst under- 18 basketball players will be scientific and practicality. Knowledge of this relationship may facilitate the development of evidence-based training programs and enable coaches to deliver effective, safe and sports specific conditioning programs for the enhancement of performance development in young athletes.

On that basis, the objective of this study is to investigate the influence of elastic band resistance training towards developing muscular power and reactive agility in U18 basketball players, providing some empirical evidence to support contemporary strength and conditioning methodologies for junior basketball development.

Methodology

Study Design

This experimental research used a pre-test–post-test design with experimental and control groups to examine the impact of elastic resistance band training on muscular power and reactive agility in under-18 basketball players. The study design was chosen because it is appropriate for identifying causal relationships between training interventions and performance outcomes in controlled settings. Physical performance testing by standardized tests was performed for both groups before and after the intervention.

Participants

Study Sample The sample included 12 male basketball players (age <18 years) Al-Defaa Al-Jawiy Sports Club who were currently registered in adolescent training programs and participated regularly in team practice sessions. All the subject were recruited using a purposive

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sampling method with specific inclusion criteria of at least 2 years' regular training history, no musculoskeletal injuries in the past 6 months.

The participating players (n=12) were randomly divided in two groups, an experimental group (n = 6), which performed elastic resistance band training combined with normal basketball practice, and a control group (n = 6), who continued with traditional training exclusively.

Subjects were also assigned into two groups at random: a training group who used elastic resistance band exercises as well as regular basketball practice and a control group who only had traditional basketball training. The two groups in the study were identical with regard to the research variables (muscular power and reactive agility), before implementation of intervention, As indicated by table 1.

Table 1. Pre-Test Equivalence Between Experimental and Control Groups in Research Variables

Variable	Group	Mean	SD	t-value	Sig. (p)
Lower-Limb Muscular Power (Vertical Jump, cm)	Experimental (n=6)	46.8	3.9	0.41	0.69
	Control (n=6)	45.9	4.2		
Upper-Limb Muscular Power (Medicine Ball Throw, m)	Experimental (n=6)	4.72	0.41	0.38	0.71
	Control (n=6)	4.68	0.39		
Reactive Agility (sec)	Experimental (n=6)	7.21	0.34	0.37	0.71
	Control (n=6)	7.28	0.31		

Training Intervention

The experimental group did a comprehensive elastic resistance band protocol that was added to the regular basketball training. The intervention was carried out in 8 weeks with 3 sessions per week. Each training session was 25–30 minutes long and occurred during the core portion of the training module.

This training program also included exercises to improve muscle power and movement efficiency in the upper and lower extremities. Interventions included resisted jumps, lateral movements, sprint starts, arm extension exercises and sports specific movement patterns with elastic bands. Training loads were progressively increased by increasing band resistance, repetitions and movement velocity in order to maintain constant neuromuscular adaptation, as shown in table 2.

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Table 2. Training Program Structure Using Elastic Resistance Bands for the Experimental Group

Week	Training Frequency	Session Duration	Training Intensity	Main Exercises Using Elastic Bands	Targeted Physical Aspect
1	3 sessions/week	25 min	Low–moderate	Resisted squats, arm extensions, lateral band walks	Neuromuscular adaptation
2	3 sessions/week	25 min	Moderate	Resisted jumps, side shuffles, chest press with band	Muscular activation
3	3 sessions/week	30 min	Moderate	Sprint starts with band, resisted lunges, overhead press	Lower & upper limb power
4	3 sessions/week	30 min	Moderate–high	Lateral reactive movements, resisted acceleration drills	Reactive movement efficiency
5	3 sessions/week	30 min	High	Plyometric jumps with band, arm power drills, resisted cuts	Explosive muscular power
6	3 sessions/week	30 min	High	Multidirectional sprint drills, resisted defensive slides	Reactive agility
7	3 sessions/week	30 min	High	Complex drills (jump + sprint), sport-specific band movements	Power & agility integration
8	3 sessions/week	30 min	High (progressive)	Game-like reactive drills with band resistance	Performance optimization

The control group continued with traditional basketball training programs that included technical, tactical, and general physical preparation without the use of elastic resistance bands.

Measurements and Testing Procedures

Muscular Power Assessment

Muscular power was determined with two field standard tests widely used in basketball performance assessment. The maximal vertical jump test that has been reported to be valid in assessing neuromuscular function and force generation capabilities was used for determining LL-EP. All subjects performed maximal vertical jumps from a standing position and the jump height was measured to the nearest centimeter after several trials, with the best result being accepted for analysis (Markovic et al., 2004). Upper limb muscle power index was assessed using the seated medicine ball throw test, in which athletes were asked to push a standardized medicine ball forward from sitting position with both hands to focus on upper body explosive power. This was quantified in metres, and the best of several measurements was taken. This test has been shown to have high validity and reliability as an index of upper-body power in athletic populations (Stockbrugger & Haennel, 2001).

Reactive Agility Assessment

Reactive agility Performances were calculated with a specific sport reactive agility test used to measure subjects' ability to respond to visual external stimuli and to perform changes of

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direction rapidly within a game-context. Players were instructed to begin the test in a ready position and react to visual stimuli presented in random order (left, right or forward) for movement direction then sprinted and changed direction as fast as they could. Unplanned movement reactions, not pre-programmed direction changes, were emphasized within the protocol, in line with the perceptual–motor demands of basketball activity. Time to complete the test was recorded using electronic timing gates, in order to guarantee measurement validity and reliability, and the athletes performed a number of trials with their best performance used in statistical analysis. This type of reactive agility test has been well established as a valid tool to measure agility performance, which includes elements of decision-making and neuromuscular capacity in team-sport players (Sheppard & Young, 2006).

Pilot Study

pilot study was conducted to assess the feasibility of testing procedures, estimate appropriate resistance levels for elastic bands and test reliability of measuring tools. The pilot sample were demographically matched players to those in the main study who were excluded from analysis.

Statistical Analysis

Data were analyzed using SPSS ver.26. Means and standard deviations were computed for all variables. Equivalence between groups at baseline was evaluated by independent samples t-tests and within group differences extracted for pre- to post-test scores using paired samples t-tests. ANCOVA was utilized to detect the differences between experimental and control groups in post-tests using pre-test scores as covariates. Statistical significance was established at ($p \leq 0.05$).

Results

Table 3. Paired Samples t-test for Pre- and Post-Tests Within Each Group in the Research Variables

Variable	Group	Pre-test Mean ± SD	Post-test Mean ± SD	t-value	Sig. (p)
Lower-Limb Muscular Power (Vertical Jump, cm)	Experimental (n=6)	46.8 ± 3.9	54.6 ± 4.1	5.12	0.002
	Control (n=6)	45.9 ± 4.2	47.1 ± 4.0	1.21	0.25
Upper-Limb Muscular Power (Medicine Ball Throw, m)	Experimental (n=6)	4.72 ± 0.41	5.61 ± 0.46	4.63	0.003
	Control (n=6)	4.68 ± 0.39	4.85 ± 0.44	1.08	0.30
Reactive Agility (sec)	Experimental (n=6)	7.21 ± 0.34	6.32 ± 0.29	5.48	0.001
	Control (n=6)	7.28 ± 0.31	7.11 ± 0.33	1.17	0.26

Table 4. Independent Samples t-test for Post-Test Comparison Between Experimental and Control Groups in Research Variables

Variable	Group	Mean ± SD	t-value	Sig. (p)
Lower-Limb Muscular Power (Vertical Jump, cm)	Experimental (n=6) Control (n=6)	54.6 ± 4.1 47.1 ± 4.0	3.27	0.009
Upper-Limb Muscular Power (Medicine Ball Throw, m)	Experimental (n=6) Control (n=6)	5.61 ± 0.46 4.85 ± 0.44	3.11	0.011
Reactive Agility (sec)	Experimental (n=6) Control (n=6)	6.32 ± 0.29 7.11 ± 0.33	3.45	0.007

Table 5. ANCOVA Results for Post-Test Differences Between Experimental and Control Groups Controlling for Pre-Test Scores

Variable	**Source**	**Sum of Squares**	**df**	**Mean Square**	**F-value**	**Sig. (p)**	**Effect Size (η²)**
Lower-Limb Muscular Power (Vertical Jump)	Pre-test (covariate)	42.31	1	42.31	4.18	0.071	0.32
	Group	156.84	1	156.84	15.49	0.003	0.63
	Error	91.12	9	10.12			
Upper-Limb Muscular Power (Medicine Ball Throw)	Pre-test (covariate)	0.84	1	0.84	3.92	0.079	0.30
	Group	2.97	1	2.97	13.86	0.004	0.60
	Error	1.93	9	0.21			
Reactive Agility	Pre-test (covariate)	0.51	1	0.51	4.06	0.075	0.31
	Group	2.14	1	2.14	16.98	0.002	0.65
	Error	1.13	9	0.13			

Discussion

The purpose of the present was to determine the impact of elastic resistance band training on muscle power (upper and lower extremity) as well as reactive agility among under-18 basketball players. The results of this study revealed statistically significant differences in all studied variables for the experimental group as compared to their pretest scores and with the control group at posttest. These findings substantiate that the application of elastic resistance band training is an efficient functional strength and neuromuscular development in youth basketball.

In lower extremity muscle power testing, significant improvement in the vertical jump performance of EG was noted for improved expression of explosive force. This could be explained by the resistance from the elastic bands which, through its variable nature, causes greater neuromuscular activation and improved production of force velocity during dynamic actions. Variable resistance training through accommodating resistance has been demonstrated to increase motor unit recruitment, and maximal strength in young athletes with the ability to match the

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natural, force-velocity curve of movement (Wilson, 2012; Shi et al., 2022). In addition, elastic resistance exercises can lead to increased concentric and eccentric muscle actions which may enhance neuromuscular coordination and power production during jumping tasks (Suchomel et al., 2016; Abdulkareem & Hassan, 2025).

Specifically, related to upper-limb muscle power, an improvement was also achieved in the medicine ball throws for experimental subjects. This finding implied that the training with resistance bands is successful in promoting upper-limb explosive strength, a key ingredient for basketball skills like passing, throwing and jumping. Prior studies have suggested that resistance-based training interventions enhance the upper-body power of individuals by enhancing neural-drive, intermuscular-coordination and movement efficiency (Comfort, et al., 2014; Finlay et al., 2022). They also offer a line of resistance designed to provide continuous tension during movement, promoting better force development and sport-related adaptations (Page & Ellenbecker, 2019; Abdel Abbas & Abdel Hussein, 2025).

It was observed that there were differences in the improvement measurements between two groups for the reactive agility, while an improvement was obtained of the experimental group, on the other hand it wasn't evidenced such kind of improving by the control group. This result suggests that a combination of sport-specific movement-based drills and resistive exercises are important for improving agility performance. Reactive agility is not only dependent on physical strength but also includes perceptual motor processing and decision-making speed. Integrative training, which consists of strength training combined with reaction and movement variability training for the improvement of agility performance, has been reported to be more successful than traditional types of training (Young & Farrow, 2006; Paul et al., 2016). The improvement in reactive agility may have been due to improved movement efficiency, rate of force development, and the level to which forces could be applied quickly while performing multidirectional tasks through elastic resistance training.

The results of ANCOVA further verified that the gains made by participants in the experimental group were unlikely to be accounted for by pre-existing differences between groups, but rather reflected intervention effects. There were large effect sizes for all variables as a result of elastic resistance band training suggesting that the practical significance of elastic resistance band training on youth basketball performance was actually quite substantial. These results are in agreement with modern strength and conditioning practices, when resistance training should be integrated to sport specific motor skills for maximum athletic development (Behm et al., 2017; Lloyd et al., 2012).

Developmentally, adolescence is a vital time for neuromuscular dynamic and motor aptitudes. Interventions delivered at this time during training have a great potential to affect subsequent years' performance. Elastic resistance bands offer a safe and adaptable form of resistance training, which a young athlete can use to progressively increase the regularity, volume and intensity of exercises without placing extraordinary mechanical load on themselves (Faigenbaum & Myer, 2010; Abdulkareem & Sattar Jabbar, 2025). The positive changes seen in the present study suggest that a structured resistance band program should be implemented in basketball training networks to improve both physical and reactive components of performance.

In summary, the findings of this study suggested that adding elastic resistance bands exercise to standard basketball training may be associated with substantial improvements in lower body muscle power and force, upper body muscle power and reactive quickness performance. The results of the present research validate variable resistance training as a challenging tool to enhance sport-specific physical performance in under-18 basketball players. They also provide increased support for the inclusion of both strength and perceptual–motor training into future developmental programs designed to optimize performance gains in young people.

Conclusions

Results suggest that performing training exercise with elastics significantly improves the lower-extremity muscle power, upper- extremity muscle power and reactive agility of U18 basketball players. Results of performance variables showed significant differences for the experimental group compared with the control, in favor of VRT to improve neuromuscular efficiency and sport-specific performance characteristics. Such results support the importance of introducing elastic resistance training in youth basketball to assist with athletic development and physical performance.

Recommendations

Practical implications Coaches and strength conditioning professionals are recommended to incorporate elastic resistance band training in conventional youth basketball training regimens focused on muscular power and reactive agility. Your training should also include range-based workouts and sport-specific drills to increase the effectiveness of your program. It is suggested that future research should further investigate long-term effects of elastic resistance training in different age groups, playing position and other physical and skill characteristics in basketball.

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References

Abdel Abbas, A., & Abdel Hussein, H. (2025). The effect of plyometric exercises with a proposed device on the development of reaction speed and defensive movement in basketball players under the age of 18. Journal of Physical Education, 37(4), 1245-1258.

Abdulghani, L. Y., Abdulghani, M. Y., & Abdulkareem, O. W. (2025). Designing a palm pressure measurement device to improve motor coordination in freestyle swimming among female students. Journal of Physical Education and Sport, 25(7), 1506–1513.

Abdulkareem, O. W., & Hassan, M. F. A. (2025). The impact of mental games on improving shooting accuracy among young basketball players in Iraqi clubs. Scientific Journal of Sport and Performance, 4(3), 342-351.

Abdulkareem, O. W., & Sattar Jabbar, H. (2025). Comparative Biomechanical Analysis of Three-Point Shooting Between Elite Iraqi Basketball Players and International Counterparts. Journal of Sport Biomechanics, 11(3), 326–342.

Amer, A., & Al-juboori, Z. (2024). Effectiveness of Kinetic Games and Their Impact on Learning Some Basic Basketball Skills for Middle School Students. Journal of Physical Education, 36(2), 514-527.

Behm, D. G., Young, J. D., Whitten, J. H., Reid, J. C., Quigley, P. J., Low, J., ... & Granacher, U. (2017). Effectiveness of traditional strength vs. power training on muscle strength, power and speed with youth: a systematic review and meta-analysis. Frontiers in physiology, 8, 423.

Comfort, P., Stewart, A., Bloom, L., & Clarkson, B. (2014). Relationships between strength, sprint, and jump performance in well-trained youth soccer players. The Journal of Strength & Conditioning Research, 28(1), 173-177.

Faigenbaum, A. D., & Myer, G. D. (2010). Resistance training among young athletes: safety, efficacy and injury prevention effects. British journal of sports medicine, 44(1), 56-63.

Ferreira, R. Z., Gomes, A. F. S., Baldim, M. A. F., Alves, R. S., Carvalho, L. C., & Simão, A. P. (2025). Effects of strength training with free weights and elastic resistance in older adults: A randomised clinical study. Journal of Bodywork and Movement Therapies, 41, 48-55.

Finlay, M. J., Bridge, C. A., Greig, M., & Page, R. M. (2022). Upper-body post-activation performance enhancement for athletic performance: a systematic review with meta-analysis and recommendations for future research. Sports Medicine, 52(4), 847-871.

Granacher, U., Lesinski, M., Büsch, D., Muehlbauer, T., Prieske, O., Puta, C., ... & Behm, D. G. (2016). Effects of resistance training in youth athletes on muscular fitness and athletic performance: a conceptual model for long-term athlete development. Frontiers in physiology, 7, 164.

Hassan, M. F. A., & Abdulkareem, O. W. (2025). The Effect of Mental Training on Psychological Hardiness and Selected Personality Traits among Adolescent Male Volleyball Players. International Journal of Exercise Science, 18(4), 1186–1198.

Hassan, M. F. A., & Abdulkareem, O. W. (2026). Effects of an Integrated Balance and Muscle Tension Control Training Program on Kinematic Variables and Defensive Accuracy in Volleyball Players. Journal of Sport Biomechanics, 11(4), 438–464.
Kumar, R.., & Amer, A. (2024). Mental arrangement in cognitive processes, processing information accurately, and performing the skill of shooting from both sides in basketball. Journal of Physical Education, 36(1), 205-191.
Lloyd, R. S., & Oliver, J. L. (2012). The youth physical development model: A new approach to long-term athletic development. Strength & Conditioning Journal, 34(3), 61-72.
Markovic, G., Dizdar, D., Jukic, I., & Cardinale, M. (2004). Reliability and factorial validity of squat and countermovement jump tests. The Journal of Strength & Conditioning Research, 18(3), 551-555.
Mulya, T. M. F., Rismayadi, A., & Kusdinar, Y. (2025). The Effect of Resistance Band Training on Arm Muscle Strength Endurance of Basketball Players. ACTIVE: Journal of Physical Education, Sport, Health and Recreation, 14(2), 488-492.
Naclerio, F., Faigenbaum, A. D., Larumbe-Zabala, E., Perez-Bibao, T., Kang, J., Ratamess, N. A., & Triplett, N. T. (2013). Effects of different resistance training volumes on strength and power in team sport athletes. The Journal of Strength & Conditioning Research, 27(7), 1832-1840.
Núñez-González, J. L., Gonzalo-Skok, O., García, M. J., Hernández Abad, F., & Núñez, F. J. (2025). Effects of Sidestep Exercise with Elastic Bands on Multidirectional Speed Abilities and Navicular Drop in Young Male Football Players: A Randomized Cross-Over Trial. Applied Sciences, 15(6), 2892.
Page, P., & Ellenbecker, T. S. (2019). Strength band training. Human Kinetics Publishers.
Paul, D. J., Gabbett, T. J., & Nassis, G. P. (2016). Agility in team sports: Testing, training and factors affecting performance. Sports medicine, 46(3), 421-442.
Sacot, A., López-Ros, V., Prats-Puig, A., Escosa, J., Barretina, J., & Calleja-González, J. (2022). Multidisciplinary neuromuscular and endurance interventions on youth basketball players: A systematic review with Meta-Analysis and Meta-Regression. International journal of environmental research and public health, 19(15), 9642.
Santos, E. J., & Janeira, M. A. (2012). The effects of resistance training on explosive strength indicators in adolescent basketball players. The journal of strength & conditioning research, 26(10), 2641-2647.
Sheppard, J. M., & Young, W. B. (2006). Agility literature review: Classifications, training and testing. Journal of sports sciences, 24(9), 919-932.
Shi, L., Cai, Z., Chen, S., & Han, D. (2022). Acute effects of variable resistance training on force, velocity, and power measures: a systematic review and meta-analysis. PeerJ, 10, e13870.
Sousa, H., Abade, E., Maia, F., Costa, J. A., & Marcelino, R. (2025). Acute and chronic effects of elastic band resistance training on athletes' physical performance: a systematic review. Sport Sciences for Health, 21(1), 69-82.
Stanković, D., Lazić, A., Trajković, N., Okičić, M., Bubanj, A., Vencúrik, T., ... & Bubanj, S. (2025). Effects of Elastic Band Training on Physical Performance in Team Sports: A

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https://jcope.uobaghdad.edu.iq

Systematic Review and Meta-Analysis. Journal of Functional Morphology and Kinesiology, 10(4), 402.

Stockbrugger, B. A., & Haennel, R. G. (2001). Validity and reliability of a medicine ball explosive power test. The Journal of strength & conditioning research, 15(4), 431-438.

Suchomel, T. J., Nimphius, S., & Stone, M. H. (2016). The importance of muscular strength in athletic performance. Sports medicine, 46(10), 1419-1449.

Wilson, J. M., Loenneke, J. P., Jo, E., Wilson, G. J., Zourdos, M. C., & Kim, J. S. (2012). The effects of endurance, strength, and power training on muscle fiber type shifting. The Journal of Strength & Conditioning Research, 26(6), 1724-1729.

Young, W., & Farrow, D. (2006). A review of agility: Practical applications for strength and conditioning. Strength & Conditioning Journal, 28(5), 24-29.

Zhu, Z., Li, Y., & Chen, H. (2024). Effects of diverse resistance training modalities on athletic performance: A systematic review and meta-analysis. *Frontiers in Physiology, 15*, 1298745.