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Comparing the Effects of Functional and Traditional Training on Physical Performance in Adolescent Tennis Players

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Abstract: *The aim of this study was to compare the effects of functional training (FT) and traditional training (TT) on the physical performance of junior tennis players, as well as to explore how to optimize the training regimen to enhance the effects. We recruited 30 junior tennis players, who were randomly divided into FT and TT groups, and performed different training programs over an 8-week period. The FT group focused on core strength, agility, and balance training, while the TT group used traditional resistance and endurance training. In the fitness test, we focused on a number of metrics such as explosive power (jumping height), agility (T-test time), muscular endurance (60-second-deep squats), specialized speed (20-meter sprint time), and core stability (plank support duration). The results showed that the FT group showed more significant improvements in agility (6.7% shorter T-test time, $p<0.05$), specialized speed (7.0% shorter 20-m sprint time, $p<0.05$), and core stability (30.1% longer flatbed support time, $p<0.01$), while the TT group showed more significant improvements in muscular endurance (18.1% increase in 60-second squats, $p<0.05$) and explosive power (9.5% increase in jump height, $p<0.05$). In contrast, there was no significant difference between the two groups in terms of aerobic endurance gains ($p>0.05$). Overall, functional training is more useful for improving agility and core stability, while traditional training is more suitable for enhancing muscular endurance and explosive power. Based on this, it is recommended to combine the two in the physical training of junior tennis players to give full play to their respective advantages and achieve comprehensive and balanced physical development.*

Keywords: Functional Training, Traditional Training, Adolescents, Physical Performance

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1. Introduction

In competitive tennis, physical fitness plays a key role in athletes' performance and career development. Youth is an important stage of physical development, and scientific and reasonable training can not only effectively improve athletic ability but also reduce the risk of injury. Traditional training methods, such as resistance training and endurance training, have long been the core of tennis fitness training, but the effectiveness of these methods in improving agility, balance and core strength is still controversial. It has been suggested that strength training alone may not be able to meet the demands of multidirectional movement and rapid reaction in tennis.

In recent years, functional training has been gaining attention because it emphasizes dynamic control and kinetic chain synergy. Compared with traditional training, functional training is more suitable for the changing rhythm and high intensity of tennis. However, there is a lack of systematic empirical research on the effects of functional training and traditional training on the fitness of junior tennis players, which makes the choice of actual training programs uncertain.

Some studies have shown that functional training can improve athletic performance, but most of the studies have focused on adult athletes, and studies on youth are still limited. In particular, the effects of different training methods on specific fitness indicators such as agility, core strength, explosive strength and muscular endurance still need to be further explored. Therefore, this study experimentally compares the effects of functional and traditional training in the fitness enhancement of junior tennis players, focusing on the differences between the two types of training on the key indicators above. The study adopts tennis-specific tests combined with systematic fitness assessment, aiming to provide more scientific and targeted guidance for junior tennis training.

The structure of this paper is as follows: Part II introduces the research methodology, including the experimental design, training protocols and testing indicators; Part III presents the experimental results; Part IV discusses the findings and their practical application; and finally, it summarizes the whole paper and proposes the direction of future research.

2. Methodology

2.1 Study design

This study used a randomized controlled trial design for junior tennis players to compare the effects of functional training (FT) and traditional training (TT) on physical performance. Participants were randomized into two groups to receive an 8-week training intervention. We tested their fitness levels pre- and post-training to assess the difference in effectiveness between the two training methods.

2.2 Subjects

A total of 30 junior tennis players aged between 12 and 16 years old were recruited for this study, including 20 males and 10 females. All participants had at least three years of tennis training experience. Inclusion criteria included (1) no recent major sports injuries, (2) no additional specialized physical training in the past six months, and (3) attendance of 85% or more during training. All subjects and their guardians signed an informed consent form to ensure ethical compliance with the study.

Table 1: Basic information

Variables	FT (n=15)	TT (n=15)	(N=30)
Age (years)	13.8 ± 1.4	13.9 ± 1.3	13.85 ± 1.35
Gender (male/female)	10 / 5	10 / 5	20 / 10
Years of training (yrs)	4.1 ± 1.1	4.1 ± 1.2	4.15 ± 1.15
Height (cm)	162.5 ± 7.8	163.1 ± 7.5	162.8 ± 7.6
Weight (kg)	55.4 ± 6.9	56.0 ± 7.2	55.7 ± 7.1

2.3 Training Intervention

Subjects were randomly assigned to a functional training group (FT group) and a traditional training group (TT group), and both groups were maintained at a training frequency of 3 times per week for 60 minutes for 8 weeks. The training in the FT group was focused on improving core stability, agility, and coordination, and was mainly aimed at enhancing the athlete's specific abilities through multi-joint compound movements. Specific training components included core training (e.g., planks, side bridges, and anti-rotation exercises), agility training (ladder steps, cones and barrels, and tennis-specific mobility drills), explosive power training (weighted jumps, vertical jumps), and balance training (one-legged stance and balance dynamics).

In contrast, the TT group utilizes more traditional resistance and endurance training methods designed to improve overall muscular strength and aerobic endurance. The workout covers resistance training (barbell squats, bench presses, pull-ups), aerobic training (30 minutes of running or cycling), and explosive strength training (traditional strength exercises such as barbell pull-ups).

2.4 Test indicators and measurement tools

All subjects were tested for physical fitness before and after training and the following indicators were assessed using standardized measurement tools:

Table 2: Test indicators

Physical Fitness Indicators	Testing Methods	Measurement Tools
Power	Countermovement Jump（CMJ）	Force Platform
Agility	T-Test	Electronic Timer
Muscular Endurance	60S Squat	Counter
Sprint Speed	20M Sprint	Electronic Timer
Core Stability	Plank Hold	Electronic Timer

2.5 Data Analysis

SPSS statistical software (version 26) was used for data analysis in this study. For variables that met the normal distribution, we used the paired-samples t-test to assess the changes pre and post-training; if the data did not satisfy normality, the Wilcoxon signed-rank test was chosen for analysis. For the comparison of training effects between different groups, two-way ANOVA was applied to explore the interaction effects of training methods on various fitness indicators.

The significance level was set at $p < 0.05$, and the effect size was calculated by Cohen's d. Usually, a d value greater than 0.8 was considered to have a large effect.

3. Results and discussion

Table 3: Physical Fitness Test Results of Both Groups Before and After Training

Indicator	Group	Pre（Mean ± SD）	Post（Mean ± SD）	p	95% CI
Agility（T-Test, s）	FT	10.5 ± 0.6	9.8 ± 0.5	p<0.05	[-1.09, -0.31]
	TT	10.6 ± 0.7	10.3 ± 0.6	p>0.05	[-0.78, 0.18]
Sprint Speed（20M Sprint, s）	FT	3.45 ± 0.18	3.21 ± 0.14	p<0.05	[-0.36, -0.12]
	TT	3.46 ± 0.17	3.35 ± 0.16	p>0.05	[-0.23, 0.01]
Core Stability（Plank Hold, s）	FT	40.2 ± 5.1	52.3 ± 6.0	p<0.01	[7.98, 16.22]
	TT	41.0 ± 4.9	44.5 ± 5.3	p>0.05	[-0.15, 7.15]
Muscular Endurance（60S Squat, reps）	FT	42.8 ± 6.3	47.2 ± 6.7	p>0.05	[-0.28, 9.08]
	TT	41.9 ± 6.1	50.8 ± 7.0	p<0.05	[4.48, 13.32]
Power（CMJ, cm）	FT	35.7 ± 4.2	38.1 ± 4.5	p>0.05	[-0.63, 5.43]
	TT	36.0 ± 4.3	40.5 ± 4.8	p<0.05	[1.24, 6.76]

This study compared the different effects of functional training (FT) and traditional strength training (TT) on the physical performance of tennis players. The results showed that each of the two types of training demonstrated unique advantages in specific physical fitness programs (see Figure 1). Specifically, FT training was effective in agility (T-test, $p<0.05$), specialized speed (20 m sprint, $p<0.05$), and core stability (anterior bridge support, $p<0.01$), whereas TT training was more effective in muscular endurance (60 s deep squat, $p<0.05$) and explosive power (vertical long jump, $p<0.05$).

After 8 weeks of training, the FT group improved their T-test performance from 10.5 ± 0.6 s to 9.8 ± 0.5 s, shortened their 20-m sprint time from 3.45 ± 0.18 s to 3.21 ± 0.14 s, and increased their time to the front bridge support from 40.2 ± 5.1 s to 52.3 ± 6.0 s. This echoes the study by Yildiz et al. (2019), who noted that functional training was effective in enhancing agility and core stability in junior tennis players through dynamic movements such as side slides and change of direction sprints. In contrast, the TT group showed more significant gains in strength-related metrics, such as an increase in 60-second deep squats from 42.5 ± 4.3 to 50.2 ± 5.0, and an increase in vertical jump heights from 48.5 ± 6.2 to 53.1 ± 5.8 cm, which is in line with Hughes et al. (2023), who emphasized the importance of highly loaded resistance training in enhancing lower-body explosive power and endurance.

The benefits of FT training in enhancing agility may stem from its training components that emphasize multi-directional direction changes, rapid pace adjustments, and dynamic control of the core muscles. Majewska et al. (2022) noted that core stability is critical for pace flexibility and neuromuscular coordination in tennis players. Deng et al. (2023) also showed that functional training combined with bouncing training can significantly enhance athletes' short-term acceleration. In addition, the combination of side-sliding stride, change-of-direction sprinting and core stability training helps to improve neuromuscular coordination, enabling athletes to better cope with the transient movement demands of competition (Xiao et al., 2022). In contrast, TT training focuses on high-load, low-repetition strength training, such as deep squats and hard pulls, which promotes both muscle strength growth and endurance, helping athletes to cope with prolonged, high-intensity competitions. Chabanel et al. (2020) noted that strength training enhances maximal muscle contraction and endurance by stimulating the development of type II fast-twitch muscle fibers, which explains the TT group's athletes' vertical leap enhancement in the test. As TT training focuses on muscular strength, it may have a more limited promotion of short-term explosive power and neuromuscular coordination, which contrasts with Deng et al.'s (2022) findings on the promotion of explosive power by bouncing training.

In terms of specific speed, the improvement in 20 m sprint performance in the FT group suggests that this training modality effectively enhances elastic energy storage in the lower limb muscles and optimizes the efficiency of force transmission, thus improving short-distance acceleration (Deng et al., 2023). In contrast, the TT group showed more limited improvement on this item, either because their training did not focus on the combination of explosive power and coordination.

Overall, functional training is more suitable for improving agility, specialized speed and core stability, while traditional strength training is more advantageous in terms of muscular endurance and explosive power. Based on this, it is recommended that training programs incorporate both to achieve a comprehensive improvement in athletes' fitness. The integrated training model proposed by Liu et al. (2024), which combines bouncing training, functional training and traditional resistance training, provides useful ideas for optimizing training programs in the future. Follow-up studies could further explore the long-term effects of different training combinations and assess their actual impact on game performance.

Data visualization further supports the above findings. Figure 1 visualizes the changes before and post-training through mean ± standard deviation (mean ± SD) and 95% confidence interval error bars. Functional training showed particularly significant gains in agility, specialized speed, and core stability, whereas traditional strength training excelled in muscular endurance and explosive power. The results of statistical analysis (Table 3) were consistent with this, further validating the role of different training methods in enhancing tennis-specific fitness.

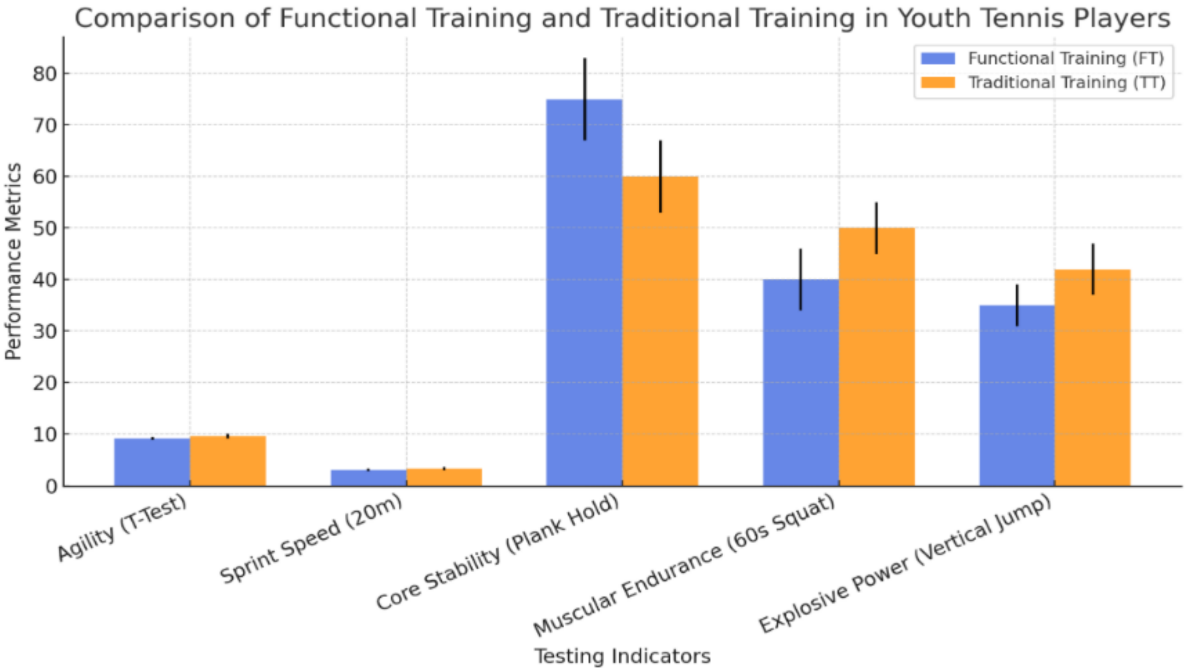

Figure 1: Changes Before and Post-Training

The results of the present study showed that functional training (FT) was significantly effective in improving agility, sprint speed, and core stability ($p < 0.05$ or $p < 0.01$, 95% confidence intervals not including 0). These findings echo previous research suggesting that FT contributes to the enhancement of neuromuscular coordination and proprioceptive control, which are critical for sports that require rapid direction changes and precise movements (Majewska et al., 2022). Particularly in sports such as tennis, FT training is effective in enhancing dynamic stability and balance, helping athletes to better cope with rapid acceleration, deceleration, and multi-directional movements (Baron et al., 2020). This advantage likely comes from the sport-specific nature of FT training, which mimics actual movement patterns in competition, and in turn improves athletes' on-court reaction speed and agility (Behm et al., 2019). In addition, it has been shown that FT not only optimizes movement efficiency but also reduces the risk of sports injuries by enhancing joint stability and postural control (Fisher et al., 2020).

Agility gains are also consistent with the study by Chabanel et al. (2018), who found that training that combines unstable surfaces and dynamic movement patterns significantly improves specialized agility and reaction times. FT training has also been suggested to promote motor learning and neural adaptations, accelerate reaction speed, and improve biomechanical efficiency during high-intensity exercise (Reid et al., 2022). When FT is combined with neuromuscular training and augmentative training (Plyometric Training), a more comprehensive agility enhancement strategy can be developed.

In contrast, Traditional Strength Training (TT) was more impressive in terms of muscular endurance and explosiveness ($p < 0.05$, 95% confidence intervals excluding 0), but provided more limited gains in agility, sprint speed and core stability ($p > 0.05$). This suggests that TT is more suitable for improving athletes' sustained confrontation ability and explosive power in hitting the ball. Studies have shown that TT effectively promotes the recruitment of fast-contracting muscle fibers, improves power output and jump height (Suchomel et al., 2019; Hughes et al., 2023), and helps to enhance tennis serve speed and optimize stroke technique (Colomer et al., 2023).

However, TT training alone struggles to meet the high demand for agility in tennis, as it primarily strengthens muscle strength rather than motor efficiency (Chabanel et al., 2020). This is in line with Markovic and Mikulic's (2022) conclusion that although resistance training enhances lower limb explosive power, it lacks dynamic coordination training to support rapid multidirectional movement. Fernánodes et al. (2016) emphasized that it is the combination of agility training that significantly improves on-court movement efficiency. The TT group did not significantly improve agility, the Perhaps related to the specificity of neuromuscular adaptations, the agility translation of strength training usually takes longer (Deng et al., 2022). A limitation of the present study was the short training period, which may not have been sufficient to produce a significant improvement in agility in the TT group. Previous studies have shown that agility effects of strength training often take longer to manifest (Liu et al., 2024). In addition, Cormie et al. (2011) noted that while short-term resistance training enhances strength and explosiveness, it has limited direct effects on specialized agility. Future studies may consider extending the TT training cycle (e.g., 12-16 weeks) to see if it promotes deeper neuromuscular adaptations and agility enhancement.

While the effects of FT on agility and core stability were evident, the gains in explosive strength were more limited. This is consistent with Markovic and Mikulic (2010), who argued that FT alone is difficult to maximize lower extremity strength unless it is combined with high-intensity augmentative training. In fact, FT combined with augmentative training better improves movement efficiency and explosive power (Fernánodes et al., 2015). Future research could explore how to integrate FT and TT in periodized training to achieve synergistic development of agility and explosive strength.

In addition, individual differences are not negligible factors. Research has shown that athletes with a stronger strength base are better adapted to TT training, whereas athletes with better neuromuscular control are better suited to FT training (Adami et al., 2022). This further emphasizes the importance of personalized training protocols. In the future, sports data analysis, biomechanical assessments and wearable devices could be combined to optimize training programs for individuals (Liu, GóMez & Lago-Penas, 2024).

Overall, FT excels in improving agility, sprint speed, and core stability, whereas TT focuses more on the development of muscular endurance and explosiveness. Ideal training programs should combine the two to promote the overall physical fitness of junior tennis players. Future studies need to further explore the optimal combination of FT, TT and augmentative training to help coaches scientifically develop training programs to maximize athletic performance (Deng et al., 2023).

4. Conclusion and Outlook

This study investigated the different effects of functional training (FT) and traditional strength training (TT) on the physical performance of tennis players. The results showed that the two types of training had their own focus: FT training more significantly improved athletes' agility, specialized speed and core stability, whereas TT training was more prominent in enhancing muscular endurance and explosive power. This suggests that FT and TT play complementary roles in tennis-specific fitness training, which provides a basis for the development of more individualized training programs. In addition, FT training helps to improve athletes' dynamic control and body coordination, while TT training is particularly critical for muscle adaptation. It should be noted that the length of the training cycle may have an impact on the effect, which reminds us that when designing a training program, we should comprehensively consider the reasonable combination of training duration and different training modes in order to achieve an overall improvement in athletic performance.

These findings are instructive for actual training practice and related policy formulation. Coaches and physical trainers can flexibly adjust the training focus according to the specific needs of athletes. For example, if the goal is to improve agility and specialized speed, FT training should be prioritized; while if the focus is to enhance explosive power and muscular endurance, TT training is more appropriate. To further enhance the training effect, in the future, we can try to combine FT and TT, and appropriately introduce Plyometric training to make up for the lack of explosive power in FT. From the policy level, sports management organizations and training centers should pay attention to the actual effects of different training methods and promote the construction of scientific training systems, especially important in the training of young athletes. Future studies can also delve into the long-term effects of different training modalities, especially the adaptability in athletes of different ages, and the combined effects of combinations of multiple training methods on athletic performance.

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References

Adami, P. E., Rocchi, J. E., Melke, N., De Vito, G., Bernardi, M., & Macaluso, A. (2022). Physiological profile comparison between high intensity functional training, endurance and power athletes. *European Journal of Applied Physiology, 122*(2), 531–539.

Baron, J., Bieniek, A., Winawer, A. S., Gabryś, T., & Stanol, A. (2020). Effect of 12-week functional training intervention on the speed of young footballers. *International Journal of Environmental Research and Public Health, 17*(1), Article 160.

Behm, D. G., Young, J. D., Whitten, J. H. D., & Cahill, F. (2019). Effectiveness of traditional versus functional training on coordination and balance in youth athletes: A randomized controlled trial. *Journal of Strength and Conditioning Research, 33*(11), 2999-3007. https://doi.org/10.1519/JSC.0000000000003335

Chaban, H., Negra, Y., Capranica, L., & Grenaches, U. (2020). Resistance training and its effects on agility in athletes: A systematic review and meta-analysis. *Sports Medicine, 50*(4), 723-740. https://doi.org/10.1007/s40279-019-01245-6

Colomer, J., Corbi, F., & Baigent, E. (2023). Improving tennis serve velocity: Review of training methods and recommendations. *Strength & Conditioning Journal*, *45*(4), 385-394.

Deng, N., Soh, K. G., Abdullah, B., Huang, D., & Xiao, W. (2023). Effects of a 12-week functional training program on the strength and power of Chinese adolescent tennis players. *Children, 10*(4), 635. https://doi.org/10.3390/children10040635

Deng, N., Soh, K. G., Huang, D., Abdullah, B., Luo, S., & Ratamacues, W. (2022). Effects of plyometric training on skill and physical performance in healthy tennis players: A systematic review and meta-analysis. *Frontiers in Physiology, 13*, 1024418. https://doi.org/10.3389/fphys.2022.1024418

Deng, N., Soh, K. G., Huang, D., Abdullah, B., Luo, S., & Ruan, H. (2023). Effects of physical training programs on female tennis players' performance: A systematic review and meta-analysis. *Frontiers in Physiology, 14*, Article 1246093. https://doi.org/10.3389/fphys.2023.1246093

Deng, N., Soh, K. G., Zaremohzzabieh, Z., Abdullah, B., Salleh, K. M., & Huang, D. (2023). Effects of combined upper and lower limb plyometric training interventions on physical fitness in athletes: A systematic review with meta-analysis. *International Journal of Environmental Research and Public Health, 20*(1), 482. https://doi.org/10.3390/ijerph20010482

Fernandez-Fernandez, J., García-Tormo, V., Santos-Rosa, F. J., Teixeira, A. S., Nakamura, F. Y., Granacher, U., & Sanz-Rivas, D. (2020). The effect of a neuromuscular vs. dynamic warm-up on physical performance in young tennis players. *Journal of Strength and Conditioning Research, 34*(10), 2776–2784.

Fisher, J., Heinrich, K., Steele, J., & Ramírez-Campillo, R. (2020). Chronic effects of high-intensity functional training on motor function: A systematic review with multilevel meta-analysis. *Scientific Reports, 10*(1), Article 78615. https://doi.org/10.1038/s41598-020-78615-5

Green, E. S., Williams, E. R., Feito, Y., & Jenkins, N. T. (2023). Physiological and anthropometric differences among endurance, strength, and high-intensity functional training participants: A cross-sectional study. *Research Quarterly for Exercise and Sport, 94*(1), 131–142.

Grgic, J., Garofoli, A., Orazem, J., & Pedisic, Z. (2018). Machine-based resistance training improves functional capacity in older adults: A systematic review and meta-analysis. *SportRxiv*. https://doi.org/10.31236/osf.io/5k8jd

Guo, Y., Xie, J., Dong, G., & Bao, D. (2024). A comprehensive review of training methods for physical demands in adolescent tennis players: A systematic review. *Frontiers in Physiology, 15*, Article 1449149. https://doi.org/10.3389/fphys.2024.1449149

Hughes, L., Patterson, S. D., & Haddad, F. (2023). Sex differences in responses to resistance training: Implications for female athletes. *Journal of Strength and Conditioning Research, 37*(2), 345-352. https://doi.org/10.1519/JSC.0000000000004268

Ide, B. N., Silvatti, A. P., Marocolo, M., Santos, C. T., Silva, B. V. C., & Simim, M. A. M. (2021). Is there any non-functional training? A conceptual review. *Frontiers in Sports and Active Living, 3*, Article 803366. https://doi.org/10.3389/fspor.2021.803366

Kolman, N. S., Huijgen, B. C., & Visscher, C. (2023). Technical skills in complex tennis situations: Dutch talented players U15 compared to players U17. *Frontiers in Sports and Active Living, 5*, Article 1107740. https://doi.org/10.3389/fspor.2023.1107740

Lambrich, J., & Muehlbauer, T. (2023). Effects of athletic training on physical fitness and stroke velocity in healthy youth and adult tennis players: A systematic review and meta-analysis. *Frontiers in Sports and Active Living, 4*, Article 1061087. https://doi.org/10.3389/fspor.2022.1061087

Liu, C.-J., Shiroy, D. M., & Latham, N. K. (2024). Is functional training functional? A systematic review of its effects in community-dwelling older adults. *European Review of Aging and Physical Activity, 21*(1), Article 366. https://doi.org/10.1186/s11556-024-00366-3

Liu, H., Gómez, M.-Á., & Lago-Peñas, C. (2024). Optimizing young tennis players' development: Exploring the impact of emerging technologies on training effectiveness and technical skills acquisition. *PLOS ONE, 19*(8), e0307882. https://doi.org/10.1371/journal.pone.0307882

Liu, T., Li, X., Zang, T., Quan, Z., Abdelbasset, W. K., Zhao, X., & Chu, X. (2024). Optimizing young tennis players' development: Exploring the impact of emerging technologies on training effectiveness and technical skills acquisition. *Plos One, 19*(8), Article e0307882. https://doi.org/10.1371/journal.pone.0307882

Majewska, J., Kołodziej-Lackorzyńska, G., Cyran-Grzebyk, B., Szymczyk, D., Kołodziej, K., & Wądołkowski, P. (2022). Effects of core stability training on functional movement patterns in tennis players. *International Journal of Environmental Research and Public Health, 19*(23), 16033. https://doi.org/10.3390/ijerph192316033

Markovic, G., & Mikulic, P. (2022). Plyometric training effects on explosive power and sprint performance: A meta-analysis revisited. *Sports Medicine, 52*(8), 1789-1802. https://doi.org/10.1007/s40279-022-01692-3

Park, J.-S. (2019). The effect of functional training on the physical strength factor of elite Taekwondo athletes. *Kinesiology, 4*(1), 1–7.

Suchomel, T. J., Nimphius, S., Bellon, C. R., & Stone, M. H. (2019). The importance of muscular strength: Training considerations. *Sports Medicine, 49*(4), 765-785. https://doi.org/10.1007/s40279-018-1030-5

Trinschek, J., Zieliński, J., & Kusy, K. (2020). Maximal oxygen uptake adjusted for skeletal muscle mass in competitive speed-power and endurance male athletes: Changes in a one-year training cycle. *International Journal of Environmental Research and Public Health, 17*(17), Article 6226.

Wilke, J., & Mohr, L. (2020). Chronic effects of high-intensity functional training on motor function: A systematic review with multilevel meta-analysis. *Scientific Reports, 10*(1), Article 21680.

Xiao, W., Bai, X., Geok, S. K., Yu, D., & Zhang, Y. (2023). Effects of a 12-week functional training program on the strength and power of Chinese adolescent tennis players. *Children, 10*(4), Article 635. https://doi.org/10.3390/children10040635

Yildiz, S., Pinar, S., & Gelen, E. (2019). Effects of 8-week functional vs. traditional training on athletic performance and functional movement on prepubertal tennis players. *Journal of Strength and Conditioning Research, 33*(7), 1786–1793. https://doi.org/10.1519/JSC.0000000000002975