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Effects of a 6-Week Agility Training Program on Emotional Intelligence and Attention Levels in Adolescent Tennis Players

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Featured Application: Engaging in a bi-weekly regimen that combines Change of Direction (CoD) and reactive agility (RA) activities within tennis training has been found to be an effective and time-efficient strategy. Additionally, this approach has demonstrated success in enhancing various aspects of emotional intelligence among highly skilled young tennis players.

Abstract: Tennis can be a mentally challenging sport, and emotional intelligence (EI) contributes significantly to an athlete's psychological well-being. Thus, this study investigated the effects of 6 weeks of a combined Change of Direction (CoD) and reactive agility (RA) intervention program on emotional intelligence (EI) in pubertal tennis players. A total of 28 youth tennis players, aged 11 to 14 years, were randomly assigned to an experimental group (EXP-G, n = 15, 13 boys [age = 13.34 ± 0.98 years, maturity offset (MO) = −0.19 ± 0.96], and 2 girls [age = 12.77 ± 0.23 years, MO = 0.78 ± 0.04]) or a control group (CON-G, n = 13, 8 boys [age = 13.37 ± 0.75 years, MO = 0.00 ± 0.71], and 5 girls [age = 13.50 ± 0.92 years, MO = 1.41 ± 1.07]). The EXP-G performed combined CoD and RA training across the 6-week intervention period. The CON-G continued with the normal five 20 min regular tennis-specific training sessions per week, including technical and tactical drills and a small-sided games format. The overall training volume was similar between groups. Pre- and post-training, Profile of Emotional Competence (PEC, [EC TOTAL: global score of emotional competence level; EC INTRA: score of intra-personal emotional competence; EC INTER: score of inter-personal emotional competence]) and d2 attention tests were assessed. The present study employed an Analysis of Covariance (ANCOVA) with pre-test covariance to assess between-group differences (EXP-G vs. CON-G) at the post-test phase, utilizing baseline values as covariates. Noteworthy outcomes were observed, indicating statistically significant and substantial between-group disparities at post-test for various measures. Specifically, these differences were evident in the attention domain (effect size, d = 1.08 [Large], p = 0.001), the EC TOTAL test (effect size, d = 0.70 [Medium], p = 0.017), the EC INTA (effect size, d = 1.35 [Large], p = 0.001), and the EC INTER (effect size, d = 0.83 [Large], p = 0.009) tests. Due to the importance of agility training for overall competitive performance in tennis, our results suggest that young players should perform such training programs as part of conditioning training if the goal is to improve emotional intelligence and mental well-being.

Keywords: attention; decision making; emotional competence; psychological adaptation; speed; youth tennis players

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1. Introduction

Agility, though often acknowledged anecdotally as a crucial element in successful tennis performance, has not received extensive scrutiny or widespread acceptance within long-term athlete development training programs [1]. Lloyd et al. [1] delved into the influence of growth, maturation, and training on both physical and psychological attributes. They emphasized that the incorporation of agility training throughout athlete development programs is imperative for enhancing the overall well-being of youth tennis players. Despite the scant research focusing on paediatric athletes and the positive effects of agility training on psychological performance in pubertal youth tennis players, recent models in Youth Physical Development [2,3] underscore the pivotal role of a structured and methodical agility plan. This plan aims to develop various agility components at specific time periods aligned with growth and maturation stages, ultimately contributing to the physical and mental well-being of young athletes.

Agility training involves exercises and drills that enhance a player's ability to change direction quickly, react swiftly, and maintain balance and coordination on the court. This type of training can indirectly impact emotional intelligence (EI) by improving a player's self-confidence, self-awareness, and ability to regulate emotions [4]. Recently, Perrotta et al. [5] investigated the associations between agility and EI in college athletes. The study reported that a significant positive correlation between agility and EI scores was observed, suggesting that athletes with better agility also displayed greater EI. In addition, earlier studies [6,7] discussed the relationship between CoD training and cognitive functions such as attention, decision making, and reaction time in elite and sub-elite U-14 soccer players. The authors showed a small-to-medium correlation between cognitive function and CoD performance. However, further intervention studies focusing on the effects of agility training on the development of EI are warranted. For instance, agility plays a crucial role in tennis, allowing players to swiftly respond to opponent's shots, cover the court effectively, and maintain balance while executing varying strokes. It also involves quick footwork, explosive movements, and agility. In the same way, agility is a critical aspect of tennis performance, as players need to quickly and efficiently move around the court to reach the ball and maintain a good posture for shot execution. Agility involves quick footwork, coordination, and balance [8]. Additionally, it has been shown that individual sports athletes, like tennis players, pose better reactive agility (RA) and CoD in lateral, semicircular and universal movement patterns, which are also highly associated with jump and sprint performance [9].

Furthermore, EI is a mental well-being factor that refers to individual proficiency to identify, comprehend, and control emotions and to recognise and respond appropriately to others emotional displays [10,11]. In the context of sports, such as tennis, EI plays a crucial role in athletes' performance, well-being, and overall success [12]. Research suggests that EI exerts a positive influence on the performance of tennis athletes [13–15]. High levels of EI enable players to stay focused, manage stress, and maintain motivation during matches [15]. By effectively managing emotions, tennis players can improve decision making, adapt to changing situations, and perform optimally while under pressure [16]. Furthermore, EI contributes to enhanced self-awareness, which allows players to recognise individual strengths and weaknesses, leading to targeted game improvements [13]. In this context, Marin et al. [17] highlighted the effectiveness of the training program in improving agility-related skills and performance in tennis. Coaches can incorporate similar training methods and exercises to improve their players' agility, leading to better performance on the court. Moreover, Memmert and Roth [18] examined the effects of agility training on attentional processes in basketball players. The study reported that CoD training improved athletes' ability to selectively deal with relevant cues while filtering out distractions, leading to improved performance in game situations. Players with higher levels of EI exhibit greater emotional resilience, coping mechanisms, and psychological flexibility [19]. Thus, they are better equipped to handle set-backs, manage stress, and maintain a positive mindset, potentially leading to improved overall mental health [15].

However, limited research specifically explores the short-term effects of agility training on EI in youth tennis. Consequently, due to the scant research examining the effects of agility training on EI in youth tennis, the present study aims to extend the body of knowledge in this subject.

Therefore, the aim of the present study was to investigate the effects of agility training exercises on EI in pubertal youth tennis players. In accordance with previous studies [17,18], the study hypothesis was that mixed CoD and RA exercises implemented in training would improve attention and EI parameters in youth tennis players. The results of the current study will allow coaches and mental trainers to develop an appropriate training program for improving EI in youth tennis players.

2. Materials and Methods

2.1. Study Design

A two-group repeated-measures experimental design was conducted to assess whether 6 weeks of bi-weekly in-season agility training would improve attention and intra- and inter-emotional competence in youth tennis players compared to peers that continued normal in-season tennis-specific training. Pre- and post-training attention, global score of emotional competence level (EC TOTAL), score of intra-personal emotional competence (EC INTRA), and score of inter-personal emotional competence (EC INTER) were assessed. Two weeks prior to baseline testing, two participant familiarization agility sessions were completed. A strength and conditioning specialist instructed the players on performing the agility exercises. The CoD and RA training group replaced 20 min of low-intensity tennis drills with specific CoD and RA training drills, on Tuesdays and Thursdays over 6 weeks. Following the agility drill of the session, players completed the remainder of the regular tennis-specific training. Data were collected over 8 weeks in March 2023 during the season. Tests were performed on a tennis court at the same time of day (between 4:00 p.m. and 5:30 p.m.) and under similar environmental conditions (temperature: 19–23 °C; humidity: 50–60%; wind speed: $\leq$2 m/s)

2.2. Participants

A cohort of 28 youth pubertal tennis players, consisting of 21 boys and 7 girls affiliated with the Tennis Club of Tunis, Tunisia, participated in this study. Table 1 provides an overview of the anthropometric characteristics of both the experimental and control groups, along with maturation-related outcomes. The participants had a collective training history of engaging in regular tennis sessions over the preceding four years. These training sessions occurred two to four times per week, each lasting 90 min, with an additional competitive match held over the weekend period. The allocation of participants to either the experimental group (EXP-G) or the active control group (CON-G) was achieved through a randomized process. Each participant was uniquely identified by an ID number, and an online randomizer tool (https://www.randomizer.org/) (accessed on 6 March 2023) was employed to ensure the random assignment of participants into the respective groups. This method aimed to eliminate bias and enhance the comparability of the groups at baseline. Throughout the duration of the study, all participants adhered to identical daily school and tennis-training routines. Prior to their involvement in the research project, participants and their parents or legal representatives were provided with a comprehensive explanation of the study's objectives, procedures, associated risks, and potential benefits. Informed consent, documented in writing, was obtained from the parents or legal representatives of all participants. Before the baseline testing, all players were examined by the club physician to ensure that participants were injury and illness-free and without orthopaedic limitations, to execute the CoD and RA training and to perform the psychological tests. The local ethics committee of the Higher Institute of Sport and Physical Education of Tunis approved the study (ISSEP-KS-LR23JS01). All procedures followed the latest version of the Declaration of Helsinki.

Table 1. Participant anthropometric characteristics.

	EXP-G (n = 15)	CON-G (n = 13)
Age (years)	13.26 ± 0.93	13.43 ± 0.80
Height (cm)	161.13 ± 9.21	162.69 ± 9.97
Sitting height (cm)	78.73 ± 4.51	79.31 ± 5.82
Body mass (kg)	53.37 ± 7.96	56.35 ± 10.36
Body fat (%)	12.55 ± 0.56	12.95 ± 0.30
PHV (years) *	−0.26 ± 0.91	−0.09 ± 0.78
APHV (years)	13.52 ± 0.30	13.53 ± 0.44

Notes: Data are presented as means and standard deviations; EXP-G = experimental group; CON-G = control group; *: years from peak height velocity; APHV: year from peak height velocity.

To determine the requisite sample size for this study was conducted through the utilisation of G-power Software 3.1.9.7, developed by the University of Dusseldorf, Germany [20]. An a priori power analysis was executed, employing F tests predicated on the experimental design, which entailed repeated-measures ANCOVA with within-between interaction analysis with baseline scores as a covariate. The study encompassed two distinct groups (EXP-G and CON-G) and measurements were taken at two specific time points (pre-test and post-test). The significance threshold (α) was established at 0.05, with the minimum effect size set at 0.60. In order to attain a power (1-β error probability) of 0.80, the determined minimum sample size for achieving statistical significance was ascertained to be 24 participants, resulting in an actualised power of 80.0%.

2.3. Data Collection Tools

2.3.1. Body Composition Measurements

The players' body height and mass were measured during the orientation sessions. These measurements were conducted on an empty stomach, following an overnight fast lasting at least 8–10 h. The assessments took place in the morning, specifically between 9:00 and 10:00 a.m. To measure body height, a wall-mounted stadiometer (OHAUS, Florham Park, NJ, USA) was utilized, while an electronic scale (Baty International, West Sussex, England) was employed for determining body mass. Additionally, the sum of skinfolds was evaluated using Harpenden skinfold callipers (Baty International, West Sussex, UK).

The estimation of body fat percentage was carried out using the equation proposed by Deurenberg et al. [21]. Notably, Deurenberg et al. [21] demonstrated comparable prediction errors in body fat percentage between adults and adolescents. These measurements were conducted by a researcher possessing extensive experience in morphological assessments, ensuring precision and reliability in the estimation of body fat percentage based on the specified anatomical sites (biceps, triceps, subscapular, and suprailiac).

2.3.2. Maturation

The maturity was non-invasively assessed by integrating chronological age and body height into a regression equation. This approach involved predicting biological age from peak height velocity, employing a methodology established and elucidated by Moore et al. [22]. The following maturity offset (MO) equations were applied for males and females, respectively: MO = −7.999994 + 0.0036124 × age × height) and MO = −7.709133 + (0.0042232 × age × height) (Table 1). This calculation has been previously validated [22]. Accordingly, all participants were considered as a pubertal.

2.3.3. Emotional Intelligence (EI)

In the current study, the Psychometric Emotional Competence (PEC) was employed as the assessment tool for evaluating emotional intelligence (EI). Participants were tasked with responding to a set of fifty items, utilizing a 5-point Likert scale (Figure 1). These

competencies were assessed separately for both one's own and others' emotions. Furthermore, the PEC was designed to facilitate a quantitative exploration of intra-personal EC (pertaining to one's own emotions) and inter-personal EC (concerning competence related to others' emotions). Additionally, the instrument furnishes a global score that reflects the overall level of EC. Notably, the PEC has previously demonstrated satisfactory discriminant and convergent validity in its application [23].

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

Figure 1. The 5-point Likert scale of the PEC.

2.3.4. Attention

The d2 test stands as a widely acknowledged and reliable methodology for evaluating selective attention, concentration capacity, and mental speed, as substantiated by previous research [24,25]. The test configuration comprises 14 lines, each containing 47 marked letters, encompassing 16 different letters, namely "p" and "d," marked with 1, 2, 3, or 4 adjacent signs. In the course of the test, participants are required to systematically scan the lines, identifying and crossing out instances of the letter "d" marked with two signs while disregarding unrelated letters. A time limit of 20 s is allotted for each line, and the resulting score is derived from the number of correctly identified letters, subtracting any errors made. Therefore, the d2 test score is calculated as (Number of letters correctly identified—Number of errors). It is noteworthy that the internal consistency of the d2 test was established to be highly robust across all variables, with coefficients ranging between 0.95 and 0.98. Additionally, the test demonstrates strong and stable criterion, construct, and predictive validity, further affirming its efficacy in assessing attention and concentration capacities [26].

2.4. Agility Training Program

The agility program, delineated in Table 2, was seamlessly incorporated into the training regimen of the EXP-G. These agility-focused sessions were assimilated within the conventional tennis training routine subsequently to the standard warm-up, thereby displacing a 20 min segment originally allocated for low-intensity drills and CoD exercises. The agility exercises included the following: a reaction to a simple visual stimulus; specific bi-directional movements with a reaction to visual colour stimuli; specific multi-directional movements with a reaction to visual direction stimuli; specific multi-directional movement with a reaction to colour stimuli in the presence of distractor signals and some specific movements with visual stimuli requiring logical processing (Figure 2). The principle of progressive overload was applied by increasing the number of sets and repetitions per exercise over the study weeks. Participants were allowed 15 and 90 s of rest between repetitions and sets, respectively [27] (Table 2). Reactive agility training, as outlined in Table 2, systematically supplanted components of the tennis-specific training regimen in the EXP-G. Specifically, passing, crossing, ball kicking, and kick serve activities were substituted with 20 min sessions devoted to reactive agility exercises. Within the EXP-G, the entire tennis-specific training duration was adjusted to 45 min, while the CON-G maintained a 65 min duration for their standard tennis-specific training sessions. The remaining 25 min of each session were allocated to a standardized warm-up (15 min) and a cool-down period (10 min) in both groups. It is noteworthy that the CON-G adhered to the conventional tennis-specific training throughout the six-week intervention period. Of note, the CoD and RA training and technical and tactical skills training did not interfere with both types of training, which could affect the study results. Following the agility training, players returned to complete regular tennis training. Training volume was similar for two groups.

Table 2. Six-week agility program.

Agility Training (Week)	First	Second	Third	Fourth	Fifth	Sixth
Reaction to a simple visual stimulus [a] (sets × reps)	2 × 4	3 × 5	4 × 5	2 × 4	3 × 5	4 × 5
Specific bidirectional movements with reaction to visual stimuli of colours [b] (sets × reps)	2 × 4	3 × 5	4 × 5	2 × 4	3 × 5	4 × 5
Specific multidirectional movements with reaction to visual stimuli of directions [c] (sets × reps)	2 × 4	3 × 5	4 × 5	2 × 4	3 × 5	4 × 5
Specific multidirectional movements with reaction to colour stimuli in the presence of distractor [d] (sets × reps)	2 × 4	3 × 5	4 × 5	2 × 4	3 × 5	4 × 5

[a] Upon the signal's appearance, the subject must react as quickly as possible by covering a distance of 5 m back and forth; [b] based on the random order of the two colours' appearance, the subject performs, as quickly as possible, a shuttle run to the indicated marker; [c] based on random appearance, the subject performs, as quickly as possible, a shuttle run to the marker indicated by the coloured arrow, following the same instructions for the movement technique; [d] the subject performs, as quickly and orderly as possible, round trips to the markers indicated successively while avoiding time loss due to the presence of distracting colours.

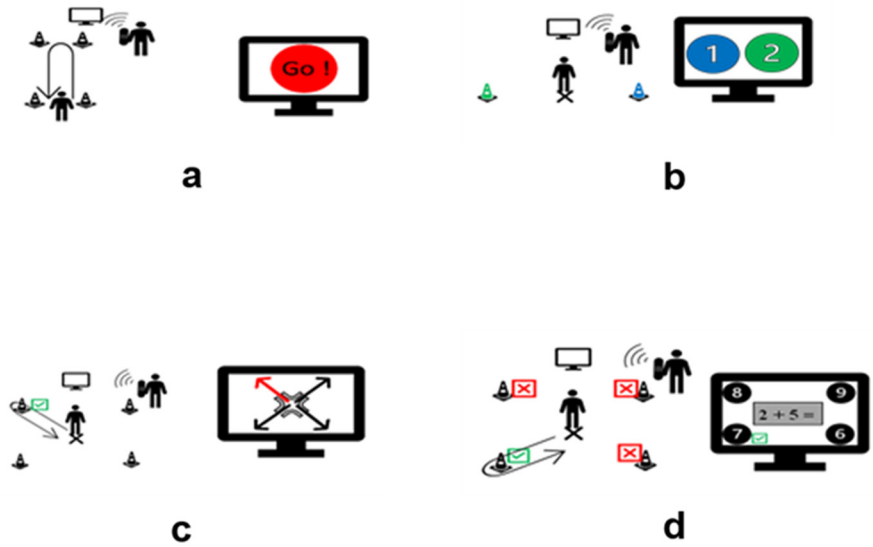

Figure 2. Schematic description of the mixed AT and CoD exercise types. (**a**) Upon the signal's appearance, the subject must react as quickly as possible by covering a distance of 5 m back and forth; (**b**) based on the random order of the two colours' appearance, the subject performs, as quickly as possible, a shuttle run to the indicated marker; (**c**) based on random appearance, the subject performs, as quickly as possible, a shuttle run to the marker indicated by the coloured arrow, following the same instructions for the movement technique; (**d**) the subject performs, as quickly and orderly as possible, round trips to the markers indicated successively while avoiding time loss due to the presence of distracting colours. The movements are performed forward/backward and laterally.

2.5. Statistical Analysis

The assessment of data normality was conducted utilizing Shapiro–Wilk and Levene tests. Preliminary distinctions between groups at baseline were scrutinized through independent *t*-tests. In light of discerned significant variations in specific baseline physical fitness metrics, subsequent analyses pertaining to the effects of training were carried out employing the Analysis of Covariance model, wherein baseline measurements (age, body height, body mass, sitting height, body fat %, PHV, and APVH) were incorporated as covariates. To evaluate alterations in performance from pre-test to post-test within and between groups, paired sample *t*-tests were executed [24]. Effect sizes were interpreted according to the following thresholds: small ($0.00 \leq d \leq 0.49$), medium ($0.50 \leq d \leq 0.79$), and large ($d \geq 0.80$) [25]. The threshold for statistical significance was established at $p \leq 0.05$, and the analysis was executed using SPSS 26.0 (IBM Corp, Armonk, NY, USA).

3. Results

The training regimen was successfully completed by the entire cohort of twenty-eight pubertal tennis players, attaining an admirable adherence rate of 100%. Throughout the duration of the study, no instances of training- or test-related injuries were reported. Table 3 provides a comprehensive overview of test data encompassing all physical fitness measures, both pre- and post-intervention. It is noteworthy that no statistically significant disparities at baseline were observed between the EXP-G and CON-G groups in terms of age, height, body mass, body fat (%), PHV, and APHV values (refer to Table 1).

3.1. Attention

Meaningful inter-group distinctions in attentional performance were evident during the post-training assessment (effect size, d = 1.00 [Large], p = 0.018), with a preference towards the EXP-G. Following the training program, the EXP-G exhibited remarkable improvements in attentional test scores (effect size, d = 1.08 [Large], p = 0.001), whereas the CON-G did not manifest a statistically significant pre-to-post alteration (effect size, d = 0.51 [Medium], p = 0.152).

3.2. EC TOTAL

In the domain of EC TOTAL, substantial between-group variations were evident at the post-training evaluation (d = 1.19 [Large], p = 0.007), with the EXP-G manifesting considerable pre-to-post training enhancements in the EC TOTAL test (d = 0.70 [Medium], p = 0.017). Conversely, the CON-G did not display a significant pre-to-post change (d = 0.45 [Medium], p = 0.136).

3.3. EC INTRA

Concerning the EC INTRA test, noteworthy between-group differences were identified at the post-training assessment (d = 1.53 [Large], p = 0.001), favouring the EXP-G. The EXP-G exhibited substantial pre-to-post training enhancements in the EC INTRA test (d = 1.35 [Large], p = 0.001), while the CON-G did not manifest a significant pre-to-post change (d = 0.18 [Medium], p = 0.551).

3.4. EC INTER

Considering the EC INTER test, meaningful between-group differences were noted at the post-training evaluation (d = 1.44 [Large], p = 0.001), favouring the EXP-G. The EXP-G demonstrated meaningful pre-to-post training improvements in the EC INTER test (d = 0.83 [Large], p = 0.009), whereas the CON-G did not display a significant pre-to-post change (d = 0.18 [Medium], p = 0.518).

The percentage changes in mean values of pre-post comparisons are highlighted in Figure 3. In the experimental group, all emotional variables had a positive change ranging from 0.52% up to 4.76%. In the control group only, the variable Attention had a positive development with 1.92%, while all other slightly decreased from 0.38% up to 0.71% from the baseline testing.

Table 3. The impact of a 6-week in-season mixed CoD and reactive agility exercise program on attention and emotional intelligence levels in youth male tennis players, the baseline and post-test performances of two distinct groups.

	Pre-Test					Diff (95% CI)	Post-Test						
		EXP-G		CON-G				EXP-G		CON-G			
	Paired Sample T-Test (Pre-Test) *p*	M	SD	M	SD		*Paired Sample T-Test* *p*	M	SD	M	SD	Diff (95% CI)	*ANCOVA* *p* (Cohen's *d*)
Attention	0.754	138.13	23.45	140.00	35.19	1.87 (−21.07 to 24.81)	0.865	149.10	1.97	141.81	2.11	7.29 (1.35 to 13.24)	<0.05 (1.00)
EC TOTAL	0.761	172.93	24.56	172.54	19.57	−0.39 (−17.84 to 17.05)	0.963	180.23	2.11	171.04	2.72	166.36 (175.72)	<0.01 (1.19)
EC INTRA	0.842	84.00	14.04	84.31	10.34	0.308 (−10.06 to 10.67)	0.951	92.49	1.29	85.20	1.39	7.28 (3.37 to 11.20)	<0.01 (1.53)
EC INTER	0.373	88.93	13.01	86.08	10.62	−2.86 (−12.18 to 6.46)	0.534	94.43	1.47	86.58	1.58	7.85 (3.38 to 12.32)	<0.01 (1.44)

Abbreviations: M: mean; SD: standard deviation; d: Cohen's d (effect size); EXP-G = experimental group; CON-G = control group; EC TOTAL: global score of emotional competence level; EC INTRA: score of intrapersonal emotional competence; EC INTER: score of interpersonal emotional competence.

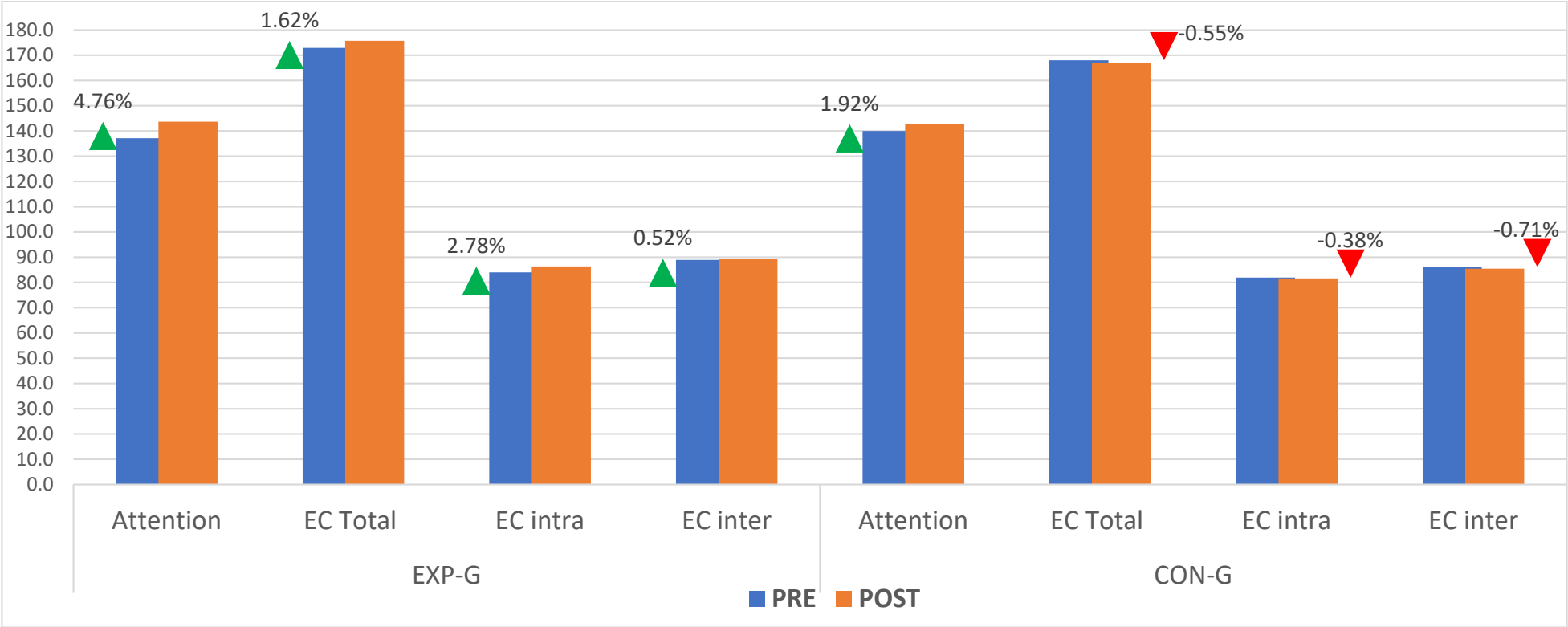

Figure 3. Pre–post percentage change between EXP and CON group after the 6-week training intervention. EXP-G = experimental group; CON-G = control group; EC TOTAL: global score of emotional competence level; EC INTRA: score of intrapersonal emotional competence; EC INTER: score of interpersonal emotional competence.

4. Discussion

This study investigated the impact of a six-week intervention involving Change of Direction (CoD) and reactive agility (RA) on emotional intelligence (EI) and attention in pubertal tennis players. The principal findings indicate that the EXP-G exhibits a positive effect on EI in comparison to the CON-G. The incorporation of CoD training is identified as a key factor in enhancing athletes' cognitive flexibility, defined as the ability to adapt and switch between different tasks, strategies, or perspectives. These results align with prior research, such as the work of Lautenbach et al. [28] which establishes a positive association between cognitive flexibility and EI. The development of cognitive flexibility is particularly evident in CoD training, where athletes are systematically challenged to respond swiftly to changing stimuli. This adaptability, honed through CoD exercises, is postulated to contribute to an improved capacity for emotional intelligence on the tennis court.

This study also observed that 6 weeks of agility training significantly improves attention in the EXP-G compared to the CON-G. In the existing literature, consistently with the present results, research suggests that physical exercise, in general, can improve attentional processes. Furthermore, a more contemporary investigation has indicated that the cognitive advantages derived from consistent physical exercise may stem from enhancements in synaptic activity, cerebral blood flow, and brain perfusion, alongside an amelioration in neuronal plasticity [29]. Indeed, agility training, with a focus on swift decision making and rapid motor responses, is likely to engage cognitive processes that contribute to improvements in attention. A relevant investigation by Lidor et al. [30] specifically explored the effects of targeted agility training on the attentional abilities of tennis players. The study found significant improvements in attentional capacity and focus following the training intervention. This investigation provides empirical support for the notion that agility training can positively influence cognitive functions, particularly attention, in the context of sports such as tennis. Similarly, Granacher et al. [3] conducted a study with young elite tennis players and observed enhanced attentional performance following a short-term agility training intervention. A further study investigated the influence of agility training on attentional abilities and tennis performance in young tennis players and indicated that agility training positively affected attentional processes, including selective attention and inhibitory control, and also led to improvements in tennis performance [31]. Attention is a critical cognitive skill in tennis, as players must quickly process and respond to rapidly changing stimuli on the court. Therefore, tennis players may incorporate agility training into regular practice routines to improve attentional abilities. This training enhances players' ability to react, make split-second decisions, and maintain sustained attention during matches. Research suggests that attentional abilities positively correlate with various performance factors, including reaction time, decision making, and situational awareness on the court [32]. Therefore, improving attention can significantly improve a player's overall game and competitive success. Additionally, agility training not only enhances physical attributes but also exerts positive effects on cognitive functions, including Attention.

This study needs to acknowledge some limitations. Firstly, agility not being considered as a dependent variable is a key limitation. Also, monitoring the training load throughout the intervention by collecting the rating perceived exertion (RPE) or other subjective or objective load variables per training session was not conducted. Secondly, it is important to note that an agility test was not included, which constitutes a notable limitation. This omission stems from the lack of established agility tests tailored specifically to tennis players. In this context, a specific battery of tests utilised by researchers to monitor junior tennis players at the service of National Tennis Federations should be employed in future research. Similarly, a training-related adaptation of more specific agility training combined with technical skills on anxiety and self-confidence in youth tennis players warrants future research. Further, the study did not test CoD training against RA training effects, as it was testing the mixed effects. Therefore, futures studies should take this into account. Agility is positively correlated with successful tennis performance, but, for instance, the study chose to analyse emotional competence instead physical performance, which might also present

a limitation. The investigated mechanism of emotional intelligence (EI) and its possible increased due to athlete experience and technical level was not investigated. The gender of the sample was not equally distributed, so this might impact the data. However, the whole sample was randomly allocated to groups to mitigate these effects. Therefore, future studies could take all of above-mentioned factors into account.

5. Conclusions

The present results highlighted that planning and delivering a bi-weekly regime of combined CoD and RA drills integrated within regular tennis training supports the enhancement of EI in highly skilled young tennis players as an effective and time-efficient method. Hence, agility training can significantly enhance attention abilities in youth tennis players. Players can improve information processing, make split-second decisions, and maintain sustained attention during matches by improving visual attention, cognitive flexibility, and reaction time. Therefore, coaches should design and implement agility training drills tailored to the specific movements and scenarios encountered in tennis matches. It should be encouraged to incorporate these methods into their practice routines to unlock the full potential of attentional skills on the tennis court. Lastly, it is recommended to create simulated match scenarios during training sessions where players focus on physical agility, managing emotions, and making strategic decisions under pressure. Coaches and practitioners should combine stressful situations to help players learn to regulate emotions and maintain focus during high-pressure competitive moments. While our study sample consisted of rather experienced youth tennis players, the findings of this study should be compared with those from novice players. It seems plausible that agility training exercises could be more appropriate for enhancing well-being and emotional intelligence due to higher training loads during training. However, further research is needed/recommended in this area.

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