

The effect of block and traditional periodization training models on jump and sprint performance in collegiate basketball players

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ABSTRACT: This study investigated the effect of block periodization (BP) and traditional periodization (TP) approaches on jumping and sprinting performance in collegiate basketball players during an 8-week pre-season period. Ten collegiate male basketball players (mean±SD; age: 21.5±1.7 years; body mass: 83.5±8.9 kg; stature: 192.5±5.4 cm) from the same team were equally assigned to a training group (BP or TP). BP and TP were designed with different numbers of power sessions (BP=8; TP=16) and recovery days (BP=14; TP=8). Counter-movement jump (CMJ) and 20-m sprint performance was measured prior to training commencement (baseline) and every 2 weeks thereafter (week 2, week 4, week 6 and week 8). Within-group, between-group and individual changes were assessed using magnitude-based statistics. Substantially higher (*likely positive*) CMJ scores were evident in week 8 compared to baseline, week 2 and week 4 with BP training. Substantially higher CMJ values were only observed in week 2 (*likely positive*) compared to baseline, with TP training. Sprint data showed *likely negative* differences in week 6 compared to baseline in both TP and BP, with no substantial differences in week 8. The only performance difference between TP and BP training was in CMJ in week 8 (*very likely negative*). Individual analysis showed that only three athletes demonstrated a negative predicted score (i.e. lower sprinting time) in BP, while all players following the TP model demonstrated positive predicted scores. BP training showed substantially higher jumping performance compared to TP, while no improvement in sprinting performance was observed in either training approach. Basketball coaches should consider using BP training rather than TP to train players' jumping abilities.

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INTRODUCTION

Basketball is an intermittent sport characterized by frequent execution of brief, high-intensity activities [1-4]. Time-motion analysis data demonstrate that basketball consists of short active phases lasting up to 20 seconds [1,5] and players perform approximately 1000 changes in movements during games [1-4]. While player activity is composed of actions spanning various intensities, high-intensity movements constitute 8.5% of live playing time and are consistently performed during crucial game scenarios that can determine the game outcome [1-4]. In turn, high-intensity activity in basketball primarily includes jumps and sprints [1-3]. Therefore, basketball coaches seek to develop jumping and sprinting ability through several training methodologies and periodization strategies.

Training periodization is a planned distribution of workload to optimize player performance during the season [6,7]. The most common periodization models adopted in basketball across the last few

decades include traditional periodization (TP) and block periodization (BP). In the TP model proposed by Matveev [8], macrocycles and mesocycles are arranged for transition from high-volume and low-intensity workloads to high-intensity and low-volume workloads. Moreover, this model is based on the simultaneous development of many fitness components (e.g. aerobic capacity, strength, power) within a regular workload distribution [8]. The BP model is characterized by concentrated training stimuli focused on specific aspects of fitness or performance components [9,10]. More precisely, the BP model contains mesocycles with a specific training goal whereby player progression is performed in a logical order to prepare for the subsequent training block [9,10]. Previous research comparing the effect of TP and BP periodization models on athletic performance showed that BP is more effective in improving anaerobic qualities in elite kayakers [11] and experienced resistance-trained athletes [7].

However, the existing evidence concerns individual sports, and there is limited knowledge regarding the efficacy of TP and BP models in team sports including basketball.

The lack of research examining training periodization models in basketball might be due to the different periodization structure compared to individual sports. In fact, basketball seasons typically consist of a short pre-season period (approximately 6-8 weeks) and a long in-season period (about 8 months) with microcycles developed around one or more games. Conversely, individual sports usually have a longer pre-season period compared to basketball, allowing an appropriate amount of time to develop a few physical qualities separately. Due to the short pre-season length, basketball coaches are often required to develop several physical capacities (i.e. endurance, power and speed) as well as technical and tactical skills in combination. Therefore, the existing findings comparing TP and BP [7,11] may not be transferable to basketball training schemes. To the best of our knowledge, only one study has investigated the effect of a prolonged BP training model on physical performance in elite basketball players, showing significant enhancement in vertical jump [12]. However, no research has compared the effect of TP and BP models on physical performance in basketball players. Therefore, the aim of this study was to investigate the effect of TP and BP models on jumping and sprinting performance in collegiate basketball players.

MATERIALS AND METHODS

Participants

Ten (6 frontcourt and 4 backcourt) collegiate male basketball players (mean±standard deviation; age: 21.5±1.7 years; body mass: 83.5±8.9 kg; stature: 192.5±5.4 cm; training experience:

7.6±1.1 years) from the same team competing in the Lithuanian National Basketball League (NKL) voluntarily participated in this study. All players were familiarized with both periodization models and exercise typologies adopted in the current study. Furthermore, all players were trained by the same coaching staff in the previous three basketball seasons. Participants were free of injuries in the 6 months before commencement of the study. The study was performed during the pre-season period where players trained 1-2 h per day, 5-6 days per week. Players did not undertake intensive exercise in the 48 h before performance testing protocols. All players were notified about the aim, procedures, requirements, benefits, and risks of the study before testing and provided written informed consent prior to participating. Ethics approval was granted from the Kaunas Regional Ethical Committee Review Board in accordance with the ethical standards of the Helsinki Declaration.

Study Design

In this study, data were gathered during an 8-week pre-season period. The training periodization models (TP vs BP) were the independent variables, while vertical jump height and sprint time were the dependent variables. Players were assigned to one of two experimental groups (BP or TP). Player assignment to each group was conducted with assistance from coaching staff so that the skill level and on-court positions (backcourt and frontcourt players) were equally matched across groups.

Training Periodization Models

The organization of each periodization model is presented in Table 1. In the TP model, three training stimuli (i.e. power, power endurance

TABLE 1. Schemes of the traditional periodization (TP) and block periodization (BP) training models adopted in this study.

	1 st Microcycle (weeks 1-2)														Total				
	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	AE	P	PE	BSAE	R
BP	AE	AE	AE	AE	AE	R	R	AE	AE	AE	AE	AE	R	R	10	-	-		4
TP	P	PE	BSAE	P	PE	BSAE	R	P	PE	BSAE	P	PE	BSAE	R	-	4	4	4	2
	2 nd Microcycle (weeks 3-4)																		
BP	PE	PE	BSAE	PE	PE	BSAE	R	PE	PE	BSAE	PE	PE	BSAE	R	-	-	8	4	2
TP	P	PE	BSAE	P	PE	BSAE	R	P	PE	BSAE	P	PE	BSAE	R	-	4	4	4	2
	3 rd Microcycle (weeks 5-6)																		
BP	BSAE	BSAE	BSAE	BSAE	BSAE	R	R	BSAE	BSAE	BSAE	BSAE	BSAE	R	R	-	-	-	10	4
TP	P	PE	BSAE	P	PE	BSAE	R	P	PE	BSAE	P	PE	BSAE	R	-	4	4	4	2
	4 th Microcycle (weeks 7-8)																		
BP	P	P	BSAE	P	P	R	R	P	P	BSAE	P	P	R	R	-	8	-	2	4
TB	P	PE	BSAE	P	PE	BSAE	R	P	PE	BSAE	P	PE	BSAE	R	-	4	4	4	2

Note: AE – aerobic endurance, P – power, PE – power endurance, BSAE – basketball-specific aerobic endurance, R – rest.

and basketball-specific aerobic endurance) were combined within each microcycle as shown in Table 2. The BP model consisted of four 2-week blocks in which the same fitness components were targeted using four training stimuli (i.e. aerobic endurance, power, power endurance and basketball-specific aerobic endurance) (Tables 1 and 3). Training stimuli were mainly characterized by the same basketball-specific technical and tactical drills except for the first block in the BP model (aerobic endurance), in which players only completed jogging and running activities. In the TP model, two training sessions for each training stimulus per week were used. Therefore, each 2-week microcycle was characterized by 12 training sessions with two rest days at the end of each week, resulting in 48 training sessions during the training programme (Table 1). In the BP model, each microcycle had a 2-week duration and was characterized by a main training stimulus. In the first and third block only aerobic endurance and basketball-specific aerobic endurance stimuli were adopted, respectively. Specifically, the first block was designed as a pre-conditioning strategy for the following blocks, while the basketball-specific aerobic endurance block was scheduled between the power endurance and power blocks and used as an active recovery block. The power and power endurance blocks incorporated basketball-specific aerobic stimuli as active recovery sessions and more rest days within each microcycle (Table 1). This approach was adopted

as a recovery strategy to reduce the risk of injury and overtraining syndrome [13]. Therefore, the BP model was characterized by fewer training sessions (i.e. 42 vs. 48) and half the number of power and power endurance sessions (i.e. 8 vs. 16, respectively) compared to the TP model (Table 1).

Exercise intensity and volume in each training session were similarly designed in the BP and TP groups using the same total session duration, exercise typology, number and duration of sets and repetitions, recovery time and work-to-rest ratio. Each training session was preceded by a 20-25-min standardized warm-up including jogging, dynamic stretching, and basketball-specific drills (i.e. ball handling, shooting, and free throws) and followed by a 15-20-min cool-down in which core conditioning exercises and static stretching were performed.

Performance Testing

Each player completed performance testing sessions before the intervention (baseline) and every 2 weeks across the training period (week 2, week 4, week 6, and week 8). In the first testing session, players' stature and body mass were also measured after completing a standardized questionnaire indicating age and training experience. In each testing session the vertical jump and sprint tests were performed following a standardized warm-up consisting of 7-min jogging,

TABLE 2. Training scheme for the traditional periodization model adopted in this study.

Week days	Days 1 and 4	Days 2 and 5	Days 3 and 6
Training session	Power	Power endurance	Basketball-specific aerobic endurance
Contents	<ul style="list-style-type: none"> • technical drills, • shooting drills, • dribbling, • variations of sprint, jumps, and core conditioning 	<ul style="list-style-type: none"> • technical drills, • shooting drills, • dribbling, • variations of sprint, jumps, and core conditioning 	<ul style="list-style-type: none"> • technical drills, • shooting drills, • tactical drills and core conditioning
Total session duration	90 min	90 min	90 min
Warm-up	20–25 min	20–25 min	20–25 min
Exercise typology	Intermittent	Intermittent	Continuous
Sets	2	1–2	1
Repetition	4–5	20–30	1
Repetition duration	4 s	4 s	NA
Repetitions rest	1 min	10 s	NA
Work/rest ratio within each set	1:15	1:2.5	NA
Rest between sets	5–7 min	5 min	NA
Cool-down	15–20 min	15–20 min	15–20 min
Sessions per week	2	2	2

Note: NA = not applicable.

TABLE 3. Training scheme for the block periodization model adopted in this study.

Microcycles (weeks)	1	2	3	4	5	6	7	8
Block	Aerobic endurance		Power endurance		Basketball-specific aerobic endurance		Power	
Content	Jogging		<ul style="list-style-type: none"> • technical drills, • shooting drills, • dribbling, • variations of sprint, jumps, and core conditioning 		<ul style="list-style-type: none"> • technical drills, • shooting drills, • tactical drills, and core conditioning 		<ul style="list-style-type: none"> • technical drills, • shooting drills, • dribbling, • variations of sprint, jumps, and core conditioning 	
Total session duration	90 min		90 min		90 min		90 min	
Warm-up	20-25 min		20–25 min		20–25 min		20–25 min	
Exercise typology	Continuous		Intermittent		Continuous		Intermittent	
Sets	1		1–2		1		2	
Repetitions	1		20–30		1		4–5	
Repetition duration	NA		4 s		NA		4 s	
Repetition rest	NA		10 s		NA		1 min	
Work/rest ratio within each set	NA		1:2.5		NA		1:15	
Rest between sets	NA		5 min		NA		5–7 min	
Cool-down	10 min		15–20 min		15–20 min		15–20 min	
Sessions per week	5		5		5		5	

Note: NA = not applicable.

5-min dynamic stretching, and 10-min low-intensity basketball-specific drills. Players were instructed to maintain regular sleeping patterns and diet, and avoid caffeine, nicotine, alcohol, and physically demanding tasks 24 h prior to each performance testing session.

Vertical jump height was measured using the counter-movement jump (CMJ) with arm swing, which has been previously used to assess vertical jump performance in basketball [14-16]. Players performed the vertical jump on a contact mat (Powertimer Testing System, New Test, Oulu, Finland) starting from an upright standing position with a preliminary downward movement to a knee angle of approximately 90° with an arm swing [17]. Three trials were performed with 20 s of passive rest between each trial. The highest jump height was used for analysis in each testing session. If the best result occurred in the third trial, an additional trial was performed [17]. The height of the jumps was calculated by applying the following equation: $H = 1.226 \times FT^2$ (m), where H = jump height (m) and FT = flight time (s) [18]. This procedure has been shown to possess high reliability in basketball players (ICC = 0.95) [19].

Sprint performance was evaluated across 20 m in a linear fashion, which has been widely used in basketball [16,17,19]. Running time was recorded using the Power Time Testing System (New Test, Oulu, Finland). Photocells connected to an electronic chronometer were

placed 20 m apart. Players commenced each trial with their lead foot placed 70 cm behind the first photocell to prevent inadvertent triggering of timing in the start position [17]. Three sprint trials were conducted with approximately 2 min of passive recovery administered between each trial. The fastest sprint time was used for analysis in each testing session [17]. The test-retest reliability of this procedure has been previously supported in basketball players (ICC = 0.95) [19].

Statistical Analysis

Magnitude-based inferential statistics were used to assess the chance of true differences (i.e. greater than the smallest worthwhile change) in each dependent variable (CMJ height and 20-m sprint time) within and between groups. All data were log-transformed for analysis to reduce bias arising from non-uniformity error and then analysed for practical significance using modified statistical spreadsheets [20,21]. Data were expressed as mean ± standard deviation, with pairwise comparisons determined using percentage of mean difference and effect size (ES) statistics with 90% confidence intervals. In addition, individual changes across time points in CMJ and sprint performance were investigated using a customized Microsoft Excel spreadsheet [22]. For both analyses (i.e. group and individual), the smallest worthwhile change was calculated as a standardized

small effect size (0.2) multiplied by the between-player standard deviation [23]. For group analyses, chances of real differences in variables were assessed qualitatively as: <1%=almost certainly not; 1-5%=very unlikely; 5-25%=unlikely; 25-75%=possibly; 75-95%=likely; 95-99%=very likely; and >99%=most likely. Clear effects greater than 75% were considered substantial [20]. If the chances of higher and lower differences were both >5%, the true effect was deemed to be unclear. Effect sizes were rated as follows: <0.20=trivial; 0.20-0.59=small; 0.60-1.19=moderate; 1.20-1.99=large; and >2.00=very large [20]. Moreover, for individual analyses, the technical error and degrees of freedom for CMJ and sprint performance were obtained according to previous investigations [24,25]. Clear effects greater than 90% were considered substantial (very likely) [24]. If the chances of a variable having higher and lower differences were both >10%, the true effect was deemed to be unclear [24].

RESULTS

Performance changes across the five time points (baseline, week 2, week 4, week 6 and week 8) within and between groups (TP and BP) are displayed in Figure 1. In the BP training group, a substantially higher CMJ was evident in week 8 compared to baseline [likely positive (94/5/0); ES: 0.46±0.28], week 2 [likely positive (92/8/0); ES: 0.38±0.22] and week 4 [likely positive (89/10/1); ES: 0.42±0.31], while similar values were found in week 2 [likely trivial (16/82/2); ES: 0.08±0.21] and week 4 [likely trivial (6/92/2); ES: 0.04±0.17] compared to baseline. In the TP training group, a substantially higher CMJ was observed in week 2 compared to baseline [likely positive (90/10/0); ES: 0.33±0.19], with similar results for comparisons between week 4 and week 2 [likely trivial (2/83/15); ES: -0.10±0.19], week 6 and week 4 [likely trivial (8/91/1); ES: 0.08±0.16], and week 8 and week 6 [likely trivial (3/77/20); ES: -0.10±0.15]. In the BP group, 20-m sprint time was substantially lower in week 6 compared to baseline [likely negative (0/14/86); ES: -0.28±0.14] and week 4 [likely negative (0/17/82); ES: -0.28±0.17], with similar results found between week 2 and baseline [likely trivial (4/76/20); ES: -0.09±0.27], week 4 and baseline [very likely trivial (1/99/1); ES: 0.00±0.08], and week 8 and week 6 [likely trivial (6/94/0); ES: 0.11±0.10]. In the TP group, substantially lower 20-m sprint times were evident in week 6 compared to baseline [likely negative (2/15/84); ES: -0.39±0.39], while week 8 showed similar results compared to week 6 [very likely trivial (4/96/0); ES: 0.15±0.04]. The analysis of between-condition differences showed a substantially higher CMJ value for BP compared to TP in week 8 [Magnitude-based inference: likely negative (3/6/91); ES: -1.04±1.08]. No substantial differences (unclear) were found for all the other between-group comparisons in both CMJ and 20-m sprint.

The individual changes in CMJ performance across the five time points are depicted in Figure 2. Analyses revealed fluctuating changes in CMJ height in the BP training group for all players with a very

likely increase from week 4 to week 6 for player 2 (98/2/0) and from baseline to week 2 for player 4 (100/0/0). Similarly, undulating trends in CMJ performance were evident in the TP training group. From baseline to week 2 a very likely increase in CMJ performance was observed for player 2 (95/5/0), player 4 (99/1/0) and player 5 (98/2/0), while player 1 demonstrated a very likely decrease (0/6/94). Furthermore, a very likely decrease in CMJ performance was observed from week 6 to week 8 for player 3 (0/8/92). All other differences were possible or unclear. Individual analyses demonstrated mainly unclear differences between consecutive time-points in the BP and TP training groups for 20-m sprint performance (Figure 3). More precisely, only player 3 exhibited a very likely (9/0/91) decrease in 20-m sprint time in week 4 compared to week 2 in TP.

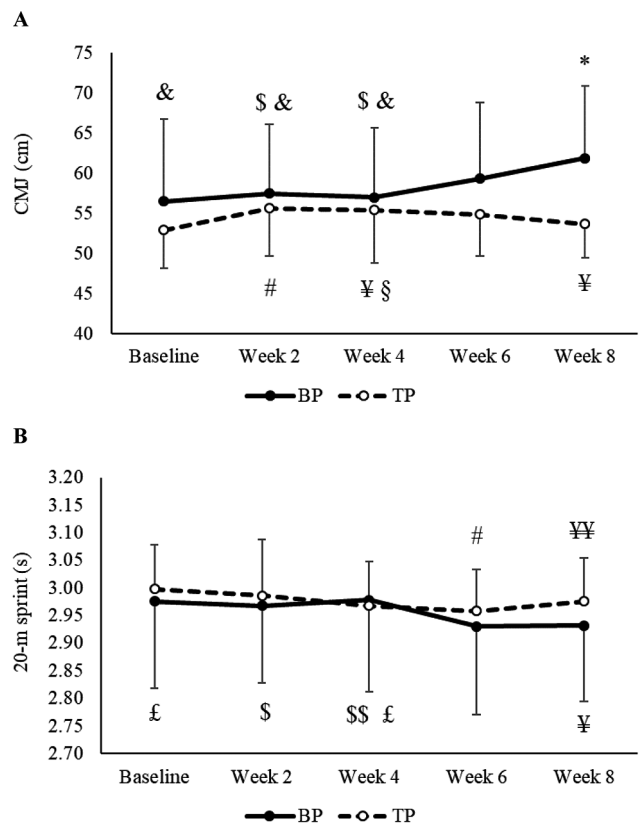


FIG. 1. Mean (± standard deviation) (A) vertical jump height and (B) 20-m sprint time across block periodization (BP) and traditional periodization (TP) training approaches in collegiate basketball players. Note: * likely between-group difference; \$ likely trivial within-group difference compared to baseline; & likely within-group difference compared to week 8; # likely within-group difference compared to baseline; A likely trivial within-group difference compared to week 6; § likely trivial within-group difference compared to week 2; \$\$ very likely trivial within-group difference compared to baseline; † likely within-group difference compared to week 6; †† very likely trivial within-group difference compared to week 6. CMJ = countermovement jump.

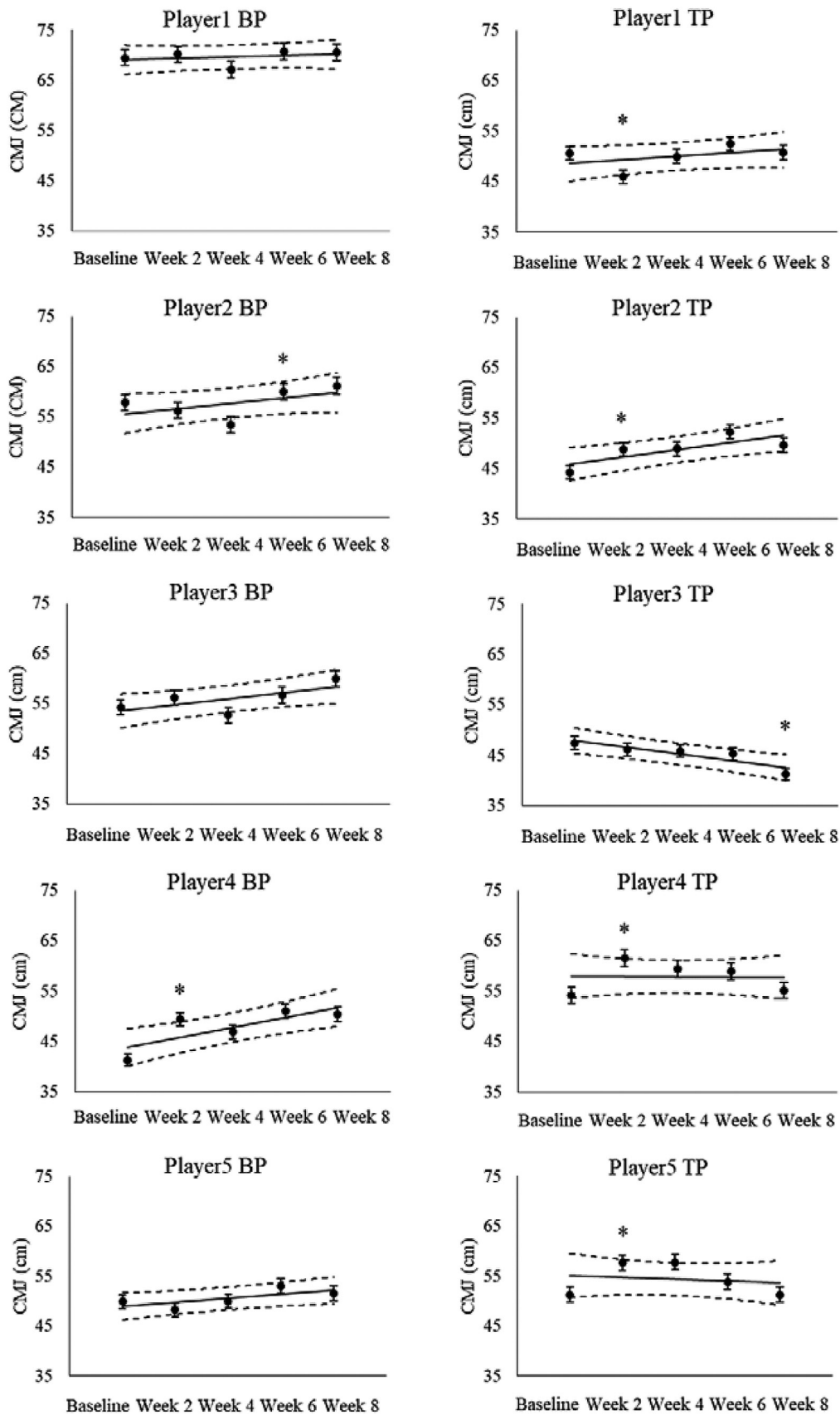


FIG. 2. Individual changes in CMJ performance for each athlete in each condition (TP and BP). Black dots represent CMJ height (\pm typical error), dashed lines indicate the smallest worthwhile change plus the typical error in the predicted value, while the black line represents the score predicted from the trend. * indicates a substantial (*very likely*) difference compared to the previous time point.

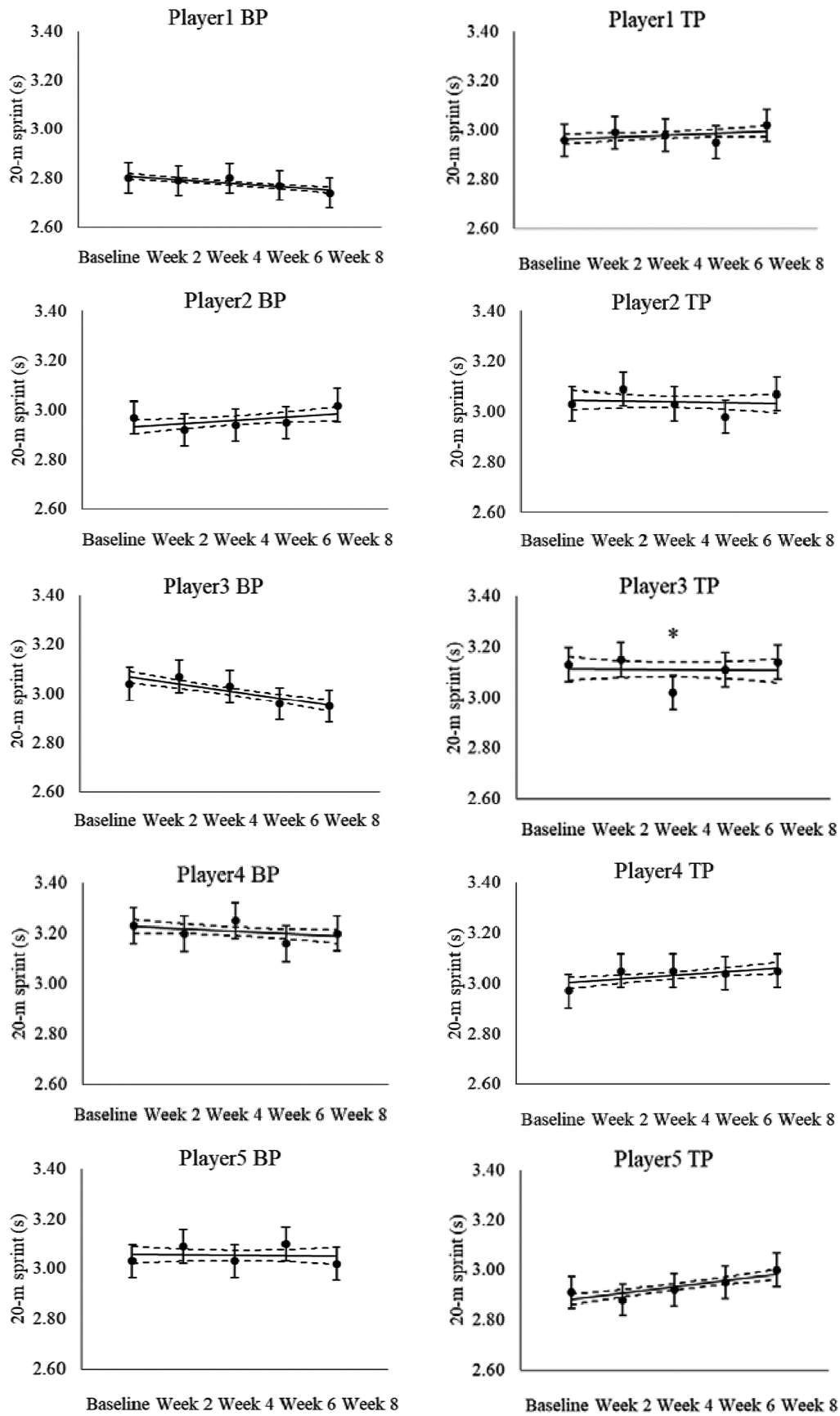


FIG. 3. Individual changes in 20-m sprint performance for each athlete in each condition (TP and BP). Black dots represent sprint time (\pm typical error), dashed lines indicate the smallest worthwhile change plus the typical error in the predicted value, while the black line represents the predicted score from the trend. * indicates a substantial (*very likely*) difference compared to the previous time point.

DISCUSSION

The aim of the study was to investigate the effect of TP and BP models on jumping and sprinting performance during an 8-week pre-season period in collegiate basketball players. The findings showed enhanced jumping performance when following a BP training model compared to a TP training model, while similar changes in sprinting performance were observed in both BP and TP models with no substantial performance improvements at the end of the investigated weeks.

The effect of different periodization approaches on anaerobic capacity has been previously investigated in various athletic groups [7,11,26,27]. Our results demonstrated substantially superior CMJ performance following the BP model than the TP model at the end of the pre-season period. While the TP model is characterized by several training goals within the same microcycle following non-linear volume and/or intensity variations to elicit specific training adaptations [28], the BP approach is structured with specific training goals within blocks [7,29,30]. The TP approach has been previously criticized since training goals are mixed, and the lack of training goal specificity might have been responsible for the absence of improvement in jumping performance [31]. Conversely, the use of proper training sequences in the BP training programme, in which accumulation (2 weeks of aerobic endurance and 2 weeks of power endurance), transformation (2 weeks of basketball-specific aerobic endurance) and realization (2 weeks of power) blocks were used, induced an increase in jumping performance. Using similar approaches with BP models, previous research has shown that accumulation blocks are necessary to develop physical qualities with long-term residual training effects, while transformation and realization blocks (which are characterized by a reduction in training load) are fundamental to produce performance benefits immediately before the competition phase [30]. This pattern was evident in the current study given that no substantial improvements in performance were observed after the accumulation blocks, which were designed to prepare players for subsequent training blocks in the BP model, while a substantial improvement in jumping performance was found after the transformation and realization blocks, which were characterized by a decrease in workload.

While the present investigation demonstrated increases in CMJ performance in the BP training model, these findings contrast with those from previous research examining various sporting populations. Specifically, Bartolomei *et al.* [7] compared 15 weeks of BP and TP training structured with an equal volume of anaerobic exercises in power athletes. Results from the study demonstrated greater improvements in upper-body power following a BP training programme, with no substantial differences in lower-body strength and jump performance between training models [7]. Furthermore, Marques *et al.* [32] documented no improvements for judo athletes in vertical jump performance (CMJ and squat jump height) following a 13-week BP approach consisting of judo-specific training. Moreover, a 10-week BP training programme during the pre-season period elicited no

significant changes in CMJ height in elite basketball players [12]. The contrasting results between some of the existing literature and our findings might be explained by the use of jumping drills at a higher weekly frequency in our study compared to previous investigations, in which lower-body strength training was undertaken only once or twice a week [7,33]. In support of this notion, it has been documented that performance improvements are dependent on weekly training frequency [34]. Furthermore, the BP and TP models used in our study were developed with specific drills aiming to improve vertical jump ability, which is a fundamental component of basketball performance [1-4], while previous studies were lacking specificity between the training exercises and the testing protocols adopted [7,32]. Nevertheless, our results suggest that a BP training model incorporating specific jumping drills is more effective than TP training for basketball coaches to use in practice for improving vertical jump height in players.

While previous investigations highlighted the advantages of the BP model compared to the TP model when adopting equalized training volumes [7,35], to the best of our knowledge, this is the first investigation adopting different volumes for power stimuli when comparing these periodization models. Indeed, in the current investigation a substantial improvement in CMJ performance was observed after 8 weeks of following a BP training programme, which contained half the number of training sessions focused on power exercises compared to the TP group. This difference in outcomes between groups despite fewer power-based sessions in the BP group might be due to the higher number of rest days and recovery sessions adopted compared to the TP group. Previous research demonstrated that basketball players require ~48 hours of rest to maximize performance after highly demanding activities involving intense eccentric basketball activity [36]. Accordingly, power endurance and power sessions were alternated with active recovery sessions (*i.e.* basketball-specific aerobic endurance), across two intensified blocks in the BP group. In contrast, power and power endurance sessions were performed in each micro-cycle in the TP group. Therefore, the power and power endurance volume was not equalized in the current study, with the BP training programme containing half of the power endurance and power sessions (8 each) compared to the TP training programme (16 each), allowing more recovery sessions and resting days (BP=14 and TP=8). In fact, previous investigations indicated that a proper balance between training and recovery is fundamental to optimize basketball performance [37,38]. Nevertheless, our findings suggest that a BP training model with a lower number of power sessions and an adequate recovery time compared to a TP training model with double the number of power sessions and less recovery time may be more effective for basketball coaches to adopt to induce improvements in CMJ performance.

While higher resting time in BP compared to TP possibly allowed better jumping performance, the 20-m sprint time showed no difference between BP and TP groups. Indeed, while a substantial increase of 20-m sprint performance in both TP and BP groups was observed

in week 6 in comparison with baseline, no substantial within-group differences were evident at the end of the investigated period. Furthermore, individual analyses showed that only 3 players demonstrated a possible lower sprinting time in the BP group, while all players in the TP group demonstrated a possible decrease in sprinting performance across the entire preseason period. Therefore, when exploring individual changes in performance, the TP training programme possibly required more resting sessions to optimize their performance, while two 8-session blocks of power endurance and power, which are stimuli closely related to sprinting performance, seemed not sufficient to enhance 20-m sprint performance in the BP group. To the best of our knowledge, this is the first study investigating the effect of TP and BP training models on sprinting performance in basketball players, and the absence of similar studies does not allow comparisons to be made. Therefore, further studies investigating the effect of different training volumes following different periodization models on wider performance measures relevant to basketball are warranted.

From a practical standpoint, the findings of this study support the use of a BP model compared to a TP model to improve jumping performance during the pre-season period. Therefore, basketball coaches and practitioners should adopt sequenced and integrated training blocks to increase player performance during the pre-season period for optimal physical preparedness prior to competition during the in-season phase. Although this study provides practically useful data for basketball coaches and practitioners when applying different training periodization approaches, it was subject to some limitations. Specifically, only 10 players were investigated and performance test-

ing was limited to physical qualities. Moreover, while training sessions were designed with equal volume and intensity in both TP and BP, the actual training load was not measured in the analysed training sessions. Consequently, future basketball studies exploring different training periodization approaches with a more robust sample size, evaluation of technical skills and proper monitoring of training session loads should be conducted.

CONCLUSIONS

Basketball training adopting a BP model improved vertical jumping performance but had no effect on sprinting performance in collegiate basketball players. In contrast, a TP training programme containing more power sessions and less recovery time than the BP programme elicited no change in vertical jump performance and possibly increased sprinting time when analysed individually. These findings suggest that BP training approaches with a proper balance between training and recovery should be used by basketball coaches and practitioners to enhance jumping performance in players, while different periodization strategies may be needed to improve sprinting performance.

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