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The concept and practice of a football training program: An understanding in the transition period

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Abstrak: The football competition period lasts 6-9 months on an annual training program. Long competitions certainly result in physical and mental fatigue in athletes. In the theory of training periodization, a period of rest after the end of the competition (transition period) gives athletes the opportunity to rest and psychic relaxation while maintaining optimal physical condition. This paper seeks to review the literature relevant to the concepts and practices in the transition period. Discussion covers two main things: the facts that occur during the transition period and exercises that athletes need to do during the transition period. The results of this discussion aim to make athletes and coaches understand the things that occur during the transition period and what exercise practices, such as what athletes need to do to prevent the potential detraining syndrome. So that in the preparation period of the new season, the athlete's performance level is in good condition.
Keywords: Football training, Periodization, Transition period

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INTRODUCTION

Athlete performance is an important and complicated thing in elite sports competitions. Various theories and practices have been found to increase an athlete's performance until top achievement. To reach the top achievement, periodization offers a theoretical model offering a framework specifically designed to prepare athletes for top performance for prioritized timeframe (Kiely, 2018). A typical characteristic of periodization is the classification of annual exercise program into three periods: preparation, competition, and transition (Matveyev, 1981; Bompa & Buzzichelli, 2018). Traditionally, the. Still, competition time is short, such as the theory of exercise periodization is identical to individual exercise with long preparation. Still, competition time is short, such as in the event Olympic Games or World Cup. It is found less suitable for team sports such as football, basket and rugby, where competition time may take longer (Nacleiro, Moody & Chapman, 2013) competition time of professional football takes place for some nine months (Walker & Hawkins, 2017).

An the annual exercise program of professional football, the preseason period commonly takes place for six weeks, then continued by a long competition period for about 40 weeks, and ended by a transition period of six weeks (Malone, 2014). After experiencing a long and heavy competition period, athlete's character as a human certainly needs time to rest. In the periodisation theory, the appropriate time is found in a transition period, which football practitioners commonly call off-season. In the transition period, generally, athletes do activities independently without strict supervision. Therefore, exercise may decrease drastically. It results in deconditioning clearly involved in fitness parameters (Caldwell & Peters, 2009). The results of other studies show that the case of exercise decreasing in rest time after competition season causes loss of some or all physiological adaptation and physical performance, defined as "detraining" (Mujika & Padilla, 2000a).

A study on various team sport-professional players shows that aerobic ability, speed and agility increase during the competition preparation time and competition, but they decrease during the transition period (Casajús, 2001; Meckel, Doron, Eliakim & Eliakim, 2018) while transition period from 6 to 12 weeks without sufficient exercise to decrease aerobic capacity, speed to run, vertical jump and agility, while the percentage of body fat increases (Caldwell & Peters, 2009; Koundourakis et al., 2014). On the other hand, the preparation period to start the new season (preseason) in football takes a relatively short time, namely, only 5-6 weeks. Unlike Australia Football (Australian Football League) provides a long time to the preseason period to develop physical quality before starting new season (Walker & Hawkins, 2017) or individual sport providing a longer preparation period. In order that athletes and trainers in preseason do not work hard to return fitness of athletes because of deconditioning, in a transition period, athletes are expected to not decrease significant physical quality (fitness level) (Harsono, 2019). Therefore, the transition period does not show that athletes do not conduct any exercise (passive recovery) (Robinson, 2014). However, in the transition period, athletes remain to do exercise to keep their physical condition.

It is like two previous periods (preparation & competition) in an annual exercise program always being attentive and found crucial in exercise periodization strategy in determining the top performance of athletes. Athletes and trainers should also consider the transitional phase. During the transition period, athletes must be trained to keep the necessary fitness level to start exercise in the preseason period (Silva, Brito, Akenhead & Nassis, 2016; Stergios et al., 2018). Because in this period, athletes also often have a problem with bodyweight conditions; in addition, this paper gives a daily nutritional regulation program during the transition period. Therefore, important points associated with concept and practice in the transition period lead to discussion; (a) theory of transition period; (b) daily nutritional regulation program during the transition period, and (c) exercise program in the transition period.

DISCUSSION

What is the transition period?

The transition period is a period explicitly designed in order for athletes conduct an optimal recovery process. In basic concept, the transition period provides time for athletes to rest, psychic relaxation and motivation of athletes to keep their optimal physical condition level (Bompa & Buzzichelli, 2018; Lidor, Tenenbaum, Ziv & Issurin, 2016; Radak, 2018). The absolute requirement that athletes must take to maintain their physical condition is to do various exercise programs while considering rest quality and nutrition. In addition, athletes use it to relax their physiological and psychological conditions. In addition, athletes use it to relax their physiological and psychological conditions. The transition period is the phase for athletes to self-prepare for facing the next season or new training cycle (Bompa & Buzzichelli, 2018; Blumenstein & Orbach, 2020). Several ways to represent in next seasonal preparation can adopt an established exercise, control of pattern, rest, nutrition and psychology of players (Mujika et al., 2018).

Transition Periode or Off-Season?

So far, there are two different understandings about the transition period after athlete's experience exercise cycle and fatiguing competition. First, understanding that active rest is used to minimize loss of physiological function occurring when the passive method is used. Active rest refers to participation in compatible sport or using exercise periods with low volume and intensity in athletic exercise (Bompa & Buzzichelli, 2018). Using this method, athletes can minimize loss of physiological adaptation and keep some common fitness levels.

In this period, athletes are not obligated to do exercise in sports branches. On the other hand, they are directed to participate in other sports such as golf, tennis, cross-country or futsal. Some players who, in competition season, experience psychic problems are recommended to more intently consult with their psychologist (Lidor, Blumenstein & Tenenbaum, 2007) in addition, it can also be used to consult about injury history and nutritional regulation for players (Mujika et al., 2018); the second understanding that can be found less proper is recommending total rest

without physical activity, frequently called an off-season. Historically, the off-season is a time of significant detraining and deconditioning. Athletes reduce or keep from exercising while enjoying less hygienic diet patterns and/or increasing less proper food and drink consumption (Mujika et al., 2018). There are two major risks occurring when players discontinue their exercise during the transition period: (a) reduction in physical ability (especially aerobic fitness and muscle strength) associated with performance and injury and (b) reduction in chronic workload (Nassis, Brito, Figueiredo & Gabbett, 2019). In relation to the latter, exercise is reduced by 50% in exercise load for four weeks; players need 2.5 weeks in order to return to initial performance before reducing the exercise.

Detraining Syndrome in Transition Period

Training cessation suddenly by trained athletes creates a phenomenon called detraining syndrome (or relaxation syndrome) (Mujika & Padilla, 2000a; Mujika & Padilla, 2000b), detention of training (exercise), or syndrome of dependence on exercise (Bompa & Buzzichelli, 2018). This type of detraining seems to occur in athletes who intentionally discontinue exercise or are forced to discontinue exercise as a response to injury. Detraining syndrome is signed by many symptoms, such as insomnia, anxiety, depression, change in cardiovascular function, and loss of appetite (Bompa & Buzzichelli, 2018). These symptoms are commonly not pathologic and can be reversed when the exercise is continued for a short time. If the discontinuation of exercise is extended, these symptoms can be clearly indicating that body of athletes cannot adapt to the sudden activities. The timeframe in which the symptoms self-appear is very specific for individual athletes, but it may occur from two to three inactive and varying weeks in severity level.

In this study, elite female athletes of pole vault who are inactive for 28 days in neuromuscular performance of detraining period of about one month or more can significantly disrupt their performance (Loturco et al., 2017). In a study on physical fitness in elite football players, short-term detraining after competition season can reduce performance really (Joo, 2018). The case will make athletes work harder to return to performance levels as previous in the preseason period. According to Bompa dan Buzzichelli, (2018 p176), symptoms of detraining syndrome are (1) Increasing in dizziness and faintness; (2) Unsystematic precordia disorder; (3) Increasing in cardiac arrhythmia; (4) Incidence of extra systolic and palpation; (5) Increasing in headache; (6) Loss of appetite; (7) Increasing in insomnia; (8) Incidence of anxiety and depression; (9) Resulting in excessive sweat; and (10) Gastric disorder.

Overall, long-and-short term exercise discontinuations result in a negative change in various performances and physiologic measures elite football players who discontinue exercise in the transition period increase the percentage of fate gradually (Koundourakis et al., 2014; Reinke et al., 2009; Sotiropoulos et al., 2009; Carling & Orhant, 2010), decrease their neuromuscular performance (Koundourakis et al., 2014; Izquierdo et al., 2007) and decrease maximal oxygen consumption capacity (VO2_Max) (Caldwell & Peters, 2009; Joo, 2018b; Joo, 2016a). If the exercise discontinuation is done continuously, it may have a negative impact on periodization during the preseason, spending for performance level during preseason where players must work harder, even difficulty to return to ideal performance, and it is not impossible that the impact continues until competition period (in-season).

Nutrition for the off-Season

Ideally, professional athletes must always keep their energy balanced. During the in-season, athletes make efforts to keep their body weight condition relatively lower. Their body weight will return to normal condition (Seebohar, 2011). However, it is not seldom that there are for athletes who experience excessive body weight in the period (Koundourakis et al., 2014; Reinke et al., 2009). It has the potential to occur more frequently if they do not care for their diet pattern during the transition period.

In terms of ' nutrition, the transition phase is an important phase of diet perspective and approach to diet regulation depends on the expectable result. If the objective is to rest and exercise volume and intensity decrease significantly, athletes need to decrease energy intake to prevent increase in unnecessary body weight (Lanham-New et al., 2011). In this period, exercise nutritionists cooperate with athletes to evaluate diet requirements and collect information,

including specific information for athletes: socio-demography, food, medical and biomedical, supplement administration information; food choice; history of body weight; the objective of exercise and demand and schedule of competition; and logistic information associated with journey and competition (Lanham-New et al., 2011). It is a good chance to meet trainer, players, and sport experts to discuss tasks that players need to do in the transition period.

In this phase, in order for nutritional intake remains to be normal, Seebohar (2011) recommend some points of perspective on nutritional need in the transition period: First, *Regulate appetite to manage heat needs.* It is necessary to consider this because, in a transition period, athletes have longer spare time than exercise; Second, *Identify necessary nutrition changes*. It supports lower spending on energy during lighter days. Food needs should focus on health generally than food to prepare for exercise. Third, *Discontinue supplemental consumption for exercise*. The total high heat of exercise supplement is unnecessary in the transition period. It is better than athletes provide nutritional needs alone naturally than depending on exercise supplements such as bars, gels, drinks, and powders. Fourth, *Prevent increase in body weight and fat presentation*. During the transition period from three to 4 weeks, it is unnecessary to decrease body weight to a significant level, but it is necessary to consider that bodyweight does not increase more than the ideal body weight.

Recommendation for Daily Nutrition

Considering Seebohar (2011) recommendation, in a transition period, total daily carbohydrate intake during this period may not exceed 3-4 g/kg (29). It is due to exercise volume with physical objects is low. Relatively lower carbohydrate intake may be found in small quantities of fruits, vegetables, and seeds. While daily protein intake ranges from 1.5 to 2.3 g/kg (29). If exercise leads to strength, the total consumed protein should be higher to keep the response to hungry feeling all day and contribute to positive protein storage. Good protein intake can be found in meat, fish and egg. Furthermore, although athletes must decrease fat intake in the the transition period; they may not forget the need for fat intake in the daily nutrition program. Consumed fat intake should not exceed the range from 1.0 to 1.2 g/kg (29). Saturated and trans-fat from fried food, acidic cream, margarine and butter should be avoided and lead to the consumption of olive oils, nuts, nut butter, seeds and fatty fish (DeWall, 2016).

In addition to intake of carbohydrates, protein and fat, it is necessary to consider fluid intake to consume. Because this period becomes a good chance to balance the body by not too depending on hydration guidance specifically, consuming vegetables and fruits rich in water substance while caring for thirsty response; colour and frequency of urine can help players balance fluid in the body (Seebohar, 2011). In addition, we need to consider the foods we consume before doing exercise, while doing exercise and after doing exercise. We consider the recommendation by Seebohar (2011), as shown in Table 1.

Table 1. Daily nutritional intake during transition period exercise

No.	Before Exercise	During Exercise	After Exercise
1.	The main goal is to stabilize blood sugar	The only nutrient that needs to be consumed is water-and certainly no sports nutrition products	The best thing to do after exercising is to repeat the snack or small meal that you had before exercise
2.	Eating a macronutrient-balanced snack or small meal with adequate water before the workout	Developing your instinctual assessment of hydration, as stated previously	Ensuring that you have lean protein, a bit of healthy fat, carbohydrates from fruits and vegetables, and water provides your body with the nutrients that may have been lost during exercise
3.	Specific nutrient timing systems are not as important if you are simply going to exercise for up to 2 hours without much structure or intensity	Do not overfeed yourself with other calorie-containing nutrients	Focus on combining the right foods rather than using sports nutrition products

Training Program in Transition Period

Training in the transition period is certainly different from preparation and competition periods. Therefore, a program in the transitional phase must be characterized by a clear objective of the exercise, low exercise session frequency, and simple exercise media to improve the adjustment of athletes (Silva et al., 2016). Moreover, Silva explained that, in arranging a training program, the coach must adopt a holistic opinion (for example, obligation of family, nee to regenerate mentality) and modality of training intervention. As practical guidance, void, a substantial decrease in performance associated with endurance and neuromuscular ability. It is believed that a structured training program in the transition period must involve at least two sessions/week, given pause for 48-72 hours to each session (Reilly & Korkusuz, 2008; Mylonis et al., 2015; Tønnessen et al., 2015; Slettaløkken & Rønnestad, 2014). Bompa and Buzzichelli stated that to remain the in a good fitness level during the transition period; athletes need to exercise two-three times/week (Bompa & Buzzichelli, 2015).

Training Program to Maintain Fitness

Physical performance of fitness parameters decreases significantly when discontinuing exercise for 2-4 weeks (Stergios et al., 2018; (Joo, 2016a; Joo, 2018b). Therefore, our first recommendation is an exercise focusing on efforts to maintain aerobic capacity. In various studies, High-Intensity Interval Training (HIIT) has become an exercise method frequently used to keep or increase endurance in a transition period in football (Slettaløkken & Rønnestad, 2014; (Joo, 2018b). In the time interval of the transition period in a football sport, 4-6 week period (Malone, 2014), it is necessary to have proper time efficiency so that training can have a maximal effect on athletes' ability. HIIT program with the proper format can be a suitable exercise stimulus. Because a positive effect on cardiopulmonary and neuromuscular functions can be achieved by low training volume (Buchheit & Laursen, 2013a; Buchheit & Laursen, 2013b). Moreover, MacInnis dan Gibala (2017) evidenced that exercise with low volume and high intensity can maintain key factors in physiologic ability (VO2_Max) (VO2_Max). HIIT exercise program with low volume does not affect the endurance of aerobic capacity but also affects hormonal responses such as testosterone, androstanediol glucuronide, and growth hormone, where these are useful for the anabolic process at a higher level than high volume protocol (Zinner et al., 2014; Wahl, 2013; Hackney et al., 2012). In the hormonal change, there are ones who argue that a negative change in body composition profile (for example, body fat & lean body mass)occurs during the transition period (Silva et al., 2016).

Considering studies by Slettalokken and Ronnestad (2014), practically, we recommend that HIIT training intervention should be done once per week (for example, 5 x 4 minutes at 87-97% HRM (Hear Rate Maximum) (Slettaløkken & Rønnestad, 2014), followed by other exercises such as; force exercise, cross-training of mini football for less than 2 hours/week; HIIT exercise is suitable to do during transition period from 2 to 4 weeks. In the session of HIIT, the trainers should focus on the need of each individual because the physiologic and neuromuscular characteristic of each athlete gets acute impacts of HIIT varying and depending on (age, gender, background and status of training) (Buchheit & Laursen, 2013a). Other factors which need to consider are regulation of intensity, total repetitions, duration of recovery and duration of total exercises (MacInnis & Gibala, 2017; Gibala & Jones, 2013).

Training Program to Maintain strength and Power

Components of muscular force and power become major items in football players' ability (Bompa & Buzzichelli, 2015; Jalilvand, 2015). These are more frequently trained and improved in preseason times deal with the new competition season. Combination of resistance training, plyometric, and specific for exercise in football; accelerations and deceleration drills need to do in the transition period. The objective is to keep important aspects of intra and inter-muscular coordination during specific motor performances in football, where force production is a key factor (Silva et al., 2016). The practice of plyometric training in the transition period can give two benefits; prevent injury and keep sports performance level (Meylan & Malatesta, 2009).

To maintain force and power capacity, we recommend the type of resistance training; Plyometric Training (PT) found in a training program to prevent injury, proposed by Measurement and Medical Study Center of Federation International de Football Association (FIFA) '11+ '. PT is a type of training using bodyweight alone with explosive motions aimed at increasing power (Nitzsche, Stutzig, Walther & Siebert, 2015). This exercise can be a practical alternative because it is easy to apply and only require simple tools and few resources.

Plyometric Training intervention is sufficient to do two times/week during the transition period. This training obligates players to make explosive motions. Specific motions include line jumps, zigzag shuffle, bounding (Thorborg et al., 2017) and squat motions to address the basic requirement of the high-force low-velocity relationship of the neuromuscular system (Silva et al., 2016). There is a report indicating that this resistance exercise structure can minimize the negative effect of long-term detraining (>4 weeks) in some muscle-morphologic factor (cross-sectional muscle area) and muscle mechanics factor (tendon stiffness) (Kubo et al., 2010), where both play an important role in producing and applying force to physiologic performance (Silva et al., 2016). However, it remains to note that the prescription of training remains to consider individual principles consisting of maximal load, intensity, repetition, set and pause of rest because it will affect each player's physiologic response. For details, we recommend exercise program as shown in Table 2.

Table 2. Microcycle training in the transition period

No.	Day 1	Day 2	Day 3
	Plyometrics Training	HIIT	Plyometrics Training
1.	**Intensity**: High intensity loaded (80-95% HRM)	**Intensity**: High intensity (87-97% HRM)	**Intensity**: High intensity loaded (80-95% HRM)
2.	**Repetition**: 4-8 reps	**Duration**: 4 min running	**Repetition**: 4-8 reps
3.	**Sets**: 3-4 sets	**Sets**: 5 bouts	**Sets**: 3-4 sets
4.	**Series**: 4 (line jumps, zigzag shuffle, bounding and squats)	**Series**: running at treadmill or field	**Series**: 4 (line jumps, zigzag shuffle, bounding and squats)
5.	**Recovery**: 1–2 min or 1:10	**Recovery**: 3 min of active resting	**Recovery**: 1–2 min or 1:10
	Note HRM=heart rate maximum; each training session gets a break, at least 48 hours so that the player gets optimal recovery; HIIT training session will be better if using a heart rate monitor so that the heartbeat intensity can be monitored properly.		

Other exercise programs in a transition period that may be alternatives to prepare athletes for new exercise period and may be applicable to various sports branches; Psychological Skill Training (PST) (Lidor et al., 2007), cycling, swimming, mount climbing, and exercise in *cabor* that is not expertise. Exercise program aims at increasing Functional Movement Screen (FMS) (Kiesel, Plisky & Butler 2011). The exercise program consists of components of movement preparation, including self and partner stretching and self-administered trigger point treatment conducted by using The Stick (RPI Atlanta, Georgia, USA) of main muscular groups found to contribute to the dysfunctional movement patterns. Individually, corrective exercise is also prescribed and conducted by supervision and instruction of force and conditioning staff according to need. The corrective exercise is to use movement intervals gained from stretching and enabling motor learning when subjects move through previously limited movement patterns.

CONCLUSION

For football players accustomed to elite competition, the transition period is a crucial time to become a bridge to the new competition season. This period can be used to recover and prevent injury, keep physical fitness and keep body weight ideal. However, sometimes players do not comply with the importance of implementing various exercise interventions in this period and tend not to process the hygienic diet pattern. While various evidence we have presented indicate that discontinuation of exercise in the short and long terms has a negative effect on body

composition change; and decreases in sports performance, especially in components of endurance and force.

Overall, the results of the study show evidence concerning the importance of the transition period in football. First, important to change the understanding of players and trainers that the long and boring transition period of post-competition to rest passively, where players do not conduct sport exercise but they must suggest that the transition period is a good chance to self-prepare to face the new competition season by regulating a good diet pattern and according to need in order that body fat & lean body mass do not increase excessively and carry out various exercise interventions aiming at maintaining endurance, force and power.

HIIT exercise program conducted once per week in transition period becomes an effective and suitable alternative to keep the fitness of players (VO_2Max) during transition period taking place for 4-6 weeks. In force and power parameters of players, plyometric training found in '11+' we recommend to do tice per week compliment micro cycle exercise program. We recommend that players, trainers and club health experts cooperate in planning points discussed to prescribe various nutritional and exercise interventions based on exercise periodization principles leading to the individual needs of each player.

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