

PHYSICAL DEVELOPMENT AND SPECIFIC WORKABILITY OF PROFESSIONAL BASKETBALL TEAM OVER LARGE PERIOD OF TIME

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ABSTRACT

The purpose of the present study is to optimize the training process of professional basketball players. The optimization to be done based on the physical development and the specific workability. Object of study are the indicators of physical development, specific physical, technical and tactical indicators of sport performance. The participants of the present study are 18 professional male basketball players playing as cadets in a Turkish professional basketball club. We have applied a complex test battery which examines general and specific physical skills. The test battery consists of 7 tests for specific physical workability and 5 tests for technical and tactical skills. The assessment data is compared with previously not published results from the estimation of the specific workability and on the same team with some changes in terms of players since then. The previous assessment has been conducted 2 years prior to the present study. In conclusion, we found that the selection of the team members has been done properly considering the requirements of the game. Although professional athletes, some of the participants of the study could be considered as overweight according to the standards. This requires some modulations on the dietary of the players. The values of most of the indicators of the physical workability and the specific technical and tactical skills remain without a significant change in comparison with the results estimated 2 years ago. The results of the study show that most of the examined sport specific skills remain relatively steady which should be positively valued because the training staff manages to maintain the level of sport performance for the last two years.

Keywords: *Basketball, Professional Sport, Optimization of Sport Performance, Physical Development, Specific Workability*

INTRODUCTION

In professional sports, training techniques are formed to increase and improve the athletes' performance, and to eliminate the deficiencies on important physical fitness parameters. Applying the technical and tactical training sessions to fast-paced in-game positions is a big factor in the improvement of features such as coordination and reaction (Ergun and Baltacı, 1997). It is crucial for the athletes to

reflect the physiological, psychological and other effects of training sessions on themselves for their optimal functions, prevention of injuries and success (Rhea et al., 2008). Today, there are many studies to improve and increase the physical fitness parameters to increase the athletes' success (Rhea et al., 2008; Harris et al., 2000;). In this context, the most commonly studied physical fitness parameters are the strength and the power (Anderson et al., 2008; Treiber et al., 1998). The 2 requirements change according to the type of the sport. In addition to this, the appropriacy of the training sessions to be suitable, specific and planned could improve the performance (Anderson et al., 2008). The diversity, applicability, and the superiority over each other increasingly gain importance. Many teams trying to succeed change their training techniques they use at the last time, abandoning the traditional methods (Usgu, 2016; Bayansalduz, 2012).

Training process of every professional athlete requires holistic and continuously updating and optimization of the training plan according to the specific needs of the performance. The achievement of this goal could be possible only when the trainers and conditioners' attempts consider the sport specific results of the players (Lyakh, et al., 2016). This requires continuous tracking and monitoring the results and performance so modulations of the program could be possible on time (Liebermann, et al., 2002). The optimization of the sport preparation requires scientific observations, collecting, processing and analysis of the outcomes.

The purpose of the present study is to optimize the training process of professional basketball players. The optimization to be done based on the physical development and the specific workability.

Object of study are the indicators of physical development, specific physical, technical and tactical indicators of sport performance.

METHODOLOGY

The participants of the present study are 18 professional male basketball players playing as cadets in a Turkish professional basketball club.

For reaching the aims of the study we have applied a complex test battery which examines general and specific physical skills. The test battery consists of 7 tests for specific physical workability and 5 tests for technical and tactical skills. The assessment data is compared with previously not published results from the estimation of the specific workability and on the same team with some changes in terms of players since then. The previous assessment has been conducted 2 years prior to the present study.

Table 1. Tests for specific physical workability

N	Indicator	Dimension	Precision	Direction of increase
1	20 m sprint	S	0,01	-
2	Sprint between cones	S	0.01	-
3	Vertical jump	Cm	1.0	+
4	Triple jump	M	1.0	+

N	Indicator	Dimension	Precision	Direction of increase
5	Throwing dense ball- backwards	M	0.01	+
6	Crunches	Number	1.0	+
7	Shuttle run	S	0.01	-

Table 2. Tests for technical and tactical skills

N	Indicator	Dimension	Precision	Direction of increase
9	Loops	number	1,0	+
10	Dribble between cones	S	0,01	-
11	Movement in defense	S	0.01	-
12	Shooting with passer	Number	1,0	+
13	Penalty shoot	N	1.0	+

Anthropometric characteristics has been also measured: height, weight, BMI.

All the results have been processed by SPSS Statistical software by applying variation analysis, T-test, index method (Гигова, 1999).

RESULTS

In basketball, one of the most important anthropometric characteristics is height. On the next graphic we can see that 8 of the participants are higher than 185 cm. The highest value in the group is 197.1 cm; the average value of the indicator is 183,42. Considering these values, we can say that the talent identification based on anthropometrics has been done successfully.

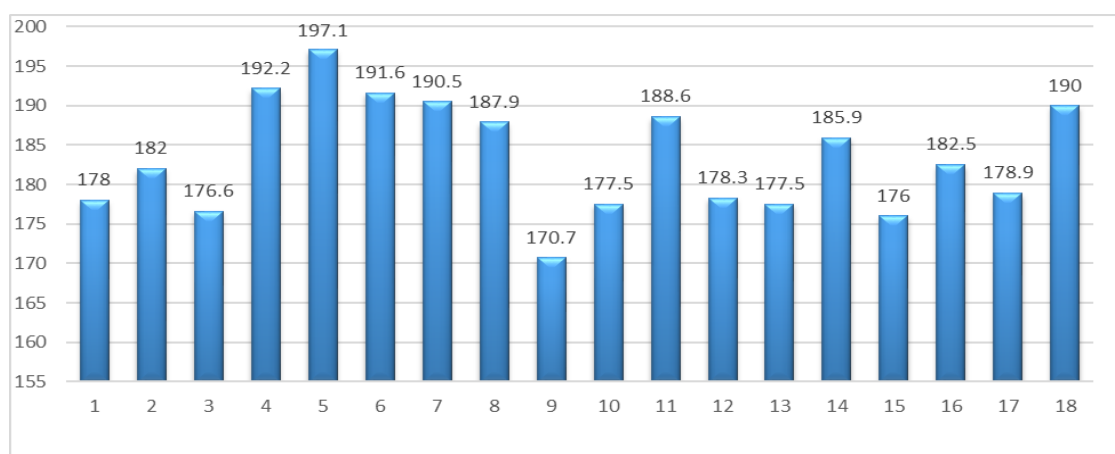


Figure 1. Height of the participants

At next stage, we have calculated the BMI of the participants. The most of them (n=12) have the value of the index between 17,82 kg/m² and 21,74 kg/m². The values for the rest are above the average and can be classified as overweight with BMI up to 24,15kg/m². For those participants we can recommend dietary optimization for reaching the proper for basketball body fitness. The percentage of body fats is very important for the fitness and respectively for the sport

performance. Some researchers suggest that body fat percentage should have optimal values between 5 and 13% which is in correlation with the sport branch and the weight category (Petkov, Maznev, & Toteva, 2003). If there is variation with more than 5% it would be considered as overweight or weakness. For the present case, the average body fat percentage is 13,24. 10 of the subjects are above the norm and the rest- below but regardless the direction it is at 3,5% within the limits. So neither of the athletes could be diagnosed with weakness or obesity.

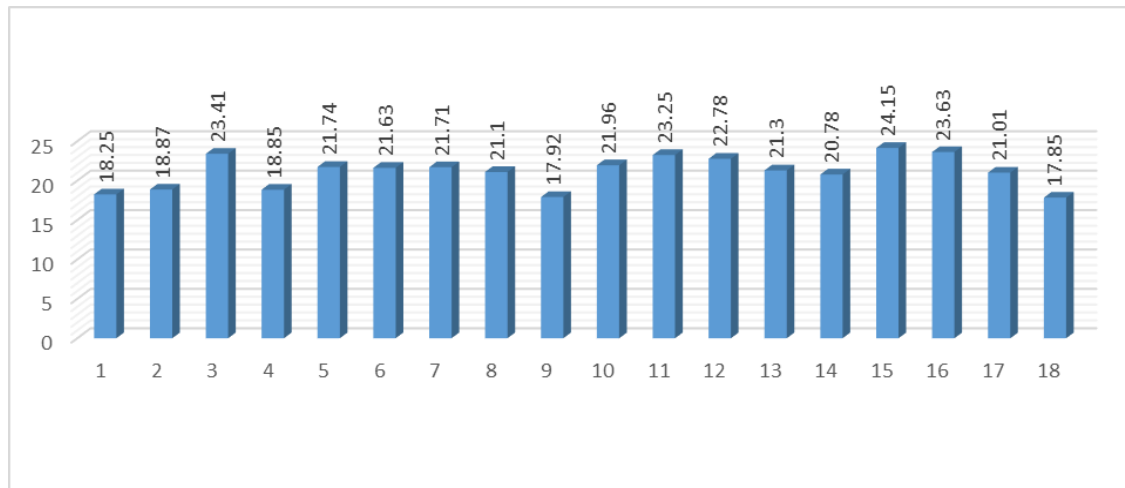


Figure 2. BMI index of the participants

At the next stage, we should analyze the indicators of specific physical workability (fig.3).

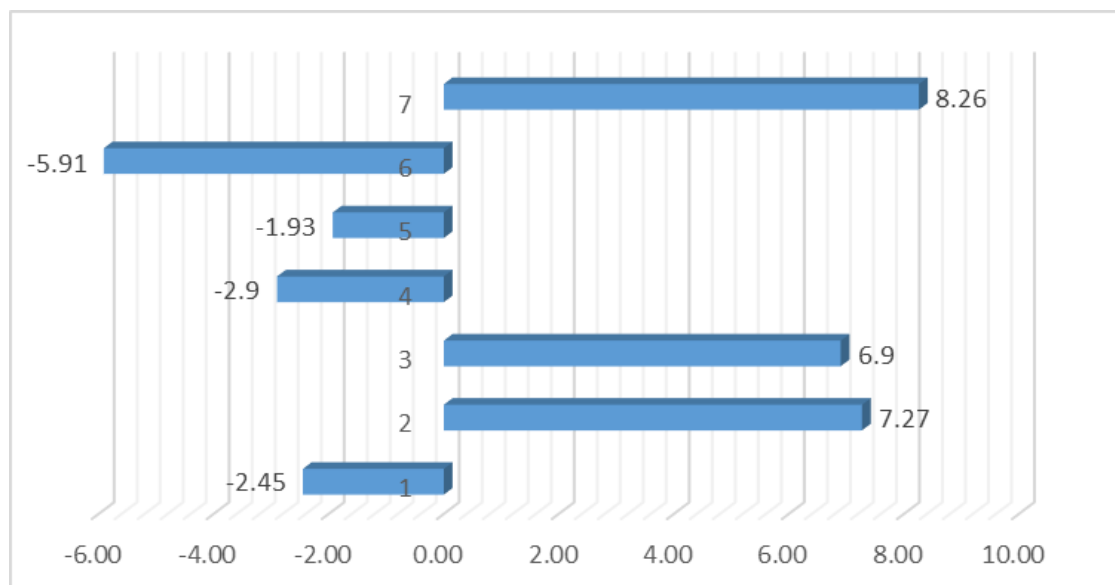


Figure 3. Significance in differences of mean values of present study and previous not published study for indicators for specific physical workability ($t_{cr}=2.03$)

The results show that, considering the critical value of 2,03 we can reject the null hypothesis for all the measured indicators with no difference only for the results of test 5: throwing dense ball backwards. This means that the mean value measuring the average explosive power of the arms is comparatively lower than the values of the same team measured 5 years before.

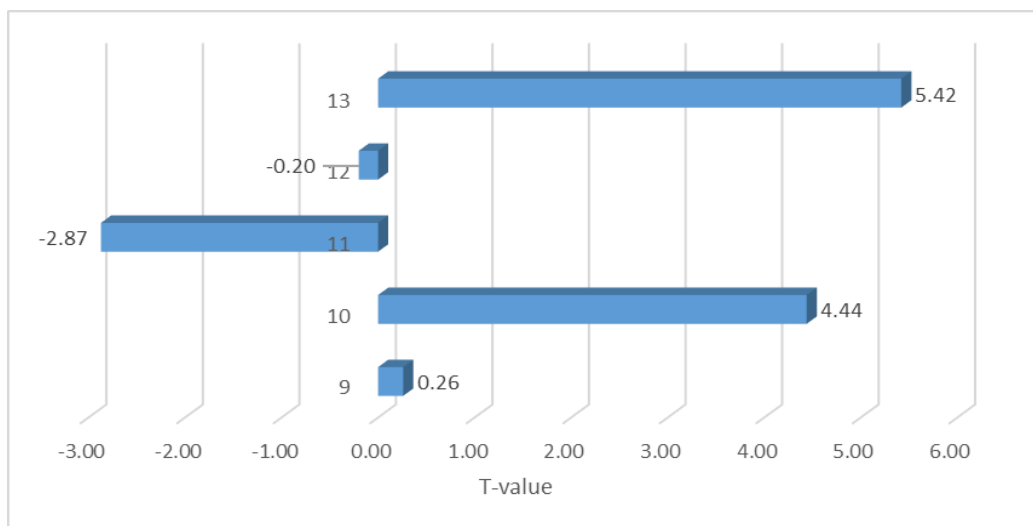


Figure 4. Significance in differences of mean values of present study and previous not published study for indicators for technical and tactical skills ($t_{cr}=2.03$)

For all the estimated values we can observe significant difference, rejecting the null hypothesis for two indicators- loops ($t=0.26 < 2.03$) and shooting with passer. So we can state that there is decrease in the performance of the team in these two indicators with other indicators remaining relatively steady.

The analytical data could be a useful source for the design and optimization of the training program. On one hand, there is no positive change in the indicators of the sport performance. Those values which remain relatively steady should be put on another test in order to be compared with referred values for the professional level in order to be increased the performance. On the other hand, we observe a negative change in terms of explosive power of upper extremities and the accuracy of penalty shooting. This calls for urgent work on their improvement in order to be maintained the overall sport performance.

DISCUSSION

The purpose of the present study is to optimize the training process of professional basketball players. The optimization to be done based on the physical development and the specific workability. Object of study are the indicators of physical development, specific physical, technical and tactical indicators of sport performance.

In the studies on basketball, there are numerous researchers who found meaningful differences in the vertical jump test scores of athletes who use individualized training programs (Brown et al., 1986; Bavlı, 2012; Matavulj, 2001; Shaji and Isha, 2009; Göllü, 2006; Anıl et al., 2001). In a study which basketball players between the ages of 14-15, who use individualized training programs, whose vertical jump, physical and physiological features were evaluated, the recent testing data of basketball players who used plyometric training show a meaningful difference statistically with a 21,90% increase (Cicioğlu, 1995). Besides, when the studies on individualized training programs were analyzed, similar results are yielded, and it was reported that the vertical jump test results of the athletes who use individualized training programs showed that the differences were statistically meaningful (Kamalakkannan et al, 2010; Arazi et al., 2012; Martel et al., 2005; Robinson et al., 2004;). In a study which investigated a 10-week individualized training program on elite basketball players, it was seen that the players who wore weight vests equal to 10% of their bodyweight achieved the best results in jump measurements than the player group who did not, and the control group (Khlifa et al., 2010). In the studies on basketball in the standing long jump parameter, it was found that the individualized training programs yield an advantageous result, and the individuals who use these training programs showed a statistically meaningful improvement on the standing long jump parameter after the training (Asadi, 2013, Andrejic, 2013).

In another study, it was reported that the speed, vertical jump and weighted ball throwing performances of athletes showed positive improvement with individualized training programs according to age groups (Krasnanska et al., 2016; Usgu, 2016). It was reported that besides vertical jump, speed and weighted ball throwing performance, the individualized training programs also improve push-up and sit-up performances (Boyacı and Afyon, 2017).

Professional sport is a serious business with high competition not only at level of athletes but at the level of trainers, training methods and programs, conditioners, managers. At macro level any kind of professional sport could be considered as a team sport where big teams of professionals take care on the performance of the athletes. In terms of this it is vitally important for each "team" to follow up the development of the athletes, their general and specific physical skills and to take optimization measures on time. The present study puts into focus a methodology for defining weaknesses at the preparation of professional players playing in a professional Turkish basketball team. The methodology compares the values of 13 indicators of the sportsmen's performance in time period of 2 years. Although, some of the players within the team has been changed over the period of the study, by definition the team performance should not suffer from this fact.

In conclusion, we found that the selection of the team members has been done properly considering the requirements of the game. Although professional athletes, some of the participants of the study could be considered as overweight according to the standards. This requires some modulations on the dietary of the players. The values of most of the indicators of the physical workability and the specific technical and tactical skills remain without a significant change in comparison with the results estimated 2 years ago; 3 indicators' values are

significantly going to negative direction. All above mentioned information is a vital basic source on which the planning of the training program for the new season can be done.

The results of the study show that most of the examined sport specific skills remain relatively steady which should be positively valued because the training staff manages to maintain the level of sport performance for the last two years.

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