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The effects of detraining period on female basketball team players aged 10-12 *

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Abstract
The purpose of the study is to find out the effect of break during the semester vacation on performance. 11 women basketball players aged 11.45±0.82 years old, height 147.27±7.29 cm, weight 39.65±6.20 kg, sports age 2.00±0.44 years participated in the study. Gülcü Primary School young women's basketball team, who trained 3 times per week for about 6 months and came in first in the competition among Isparta primary schools, have taken part in the study. The team was given pretest after the group's final match and afterwards the team took a break from training. Second measurements were taken 20 days later. In order to determine changes in the performance of the players, their resting heart rate, vertical jump, handgrip strength, flexibility, aerobic endurance and anaerobic endurance were examined. Descriptive statistics and Wilcoxon matched-pair two sample test were used for the analysis. It was observed that there was an increase in resting heart rates ($p<0.05$), decrease in vertical jump rates, aerobic endurance, anaerobic endurance ($p<0.05$). Hand grip strength did not change significantly. According to the findings it can be concluded that, a break period for 20 days from training affects the performance negatively For this reason, high-level performance aimed at primary school teams will need to continue training during the semester break.

Keywords: Basketball, detraining, performance.

10-12 Yaş Kız Basketbol Takımı Oyuncularında Detraining Süresinin Performans Üzerine Etkilerinin Araştırılması

Özet

Bu çalışmanın amacı bir eğitim öğretim yılının yarıyıl tatilinde antrenmanlara verilecek olan araların performans üzerine etkisini araştırmaktır. Çalışmaya yaşları 11.45±0.82 yıl, boyları 147.27±7.29 cm, vücut ağırlıkları 39.65±6.20 kg, spor yaşları 2.00±0.44 yıl olan 11 kız basketbolcu gönüllü katılmıştır. Çalışmaya yaklaşık 6 aydır haftada 3 gün sıklıkla antrenman yapan, Isparta ili ilköğretim okulları müsabakalarında il birincisi olan Gülcü İlköğretim Okulu yıldız kız basketbol takımı alınmıştır. Takım son grup maçından 2 gün sonra ön testlere alınmış ve devamında antrenmanlara ara verilmiştir. 20 gün sonra ikinci ölçümler yapılmıştır. Sporcuların performanslarındaki değişiklikleri tespit etmek için sporcuların istirahat nabızları, dikey sıçrama yüksekliği, el kavrama kuvvetleri, aerobik dayanıklılıkları ve anaeorobik dayanıklılıklarına bakılmıştır. Verilerin değerlendirilmesinde tanımlayıcı istatistikler ve Wilcoxon işaret testi kullanılmıştır. Çalışma verilerine göre dinlenim kalp atım sayısında anlamlı artış ($p<0.05$), dikey sıçrama yüksekliğinde, aerobik dayanıklılıkta, anaeorobik kapasitede anlamlı azalış ($p<0.05$) görülmüştür. El kavrama kuvvetinde anlamlı bir değişme olmamıştır ($p>0.05$). Sonuç olarak antrenmanlara verilen 20 günlük ara performansı olumsuz etkilemektedir. Bu nedenle üst düzey verimi hedefleyen ilköğretim okulu takımlarının yarıyıl tatilinde de antrenmanlarına devam etmeleri gerekmektedir.

Anahtar kelimeler: Basketbol, detraining, performans.

INTRODUCTION

Training is all of chairs applied certain time periods and creating functional and morphological accordance at organism. On the account of sportive efficiency, training is planned and arranged practices which are applied to reach maximum

efficiency to be provided competition requirement (2).

Trainings performed by children are important to improve sportive performance as well as development of physiologic and biomotoric features. Biomotoric features are accepted as person' main movement features and these include endurance, strength, speed, mobility, flexibility and coordination (12).

Athletes' bio motoric features may be increase with applied training (28). Notwithstanding, increased these features may be lost with breaks given training (5).

In sport literature, detraining is known as declines in sportive performance and physiological adaptations are occurred in result of training decline. Beginning from detraining is started; declines in some physiological values are occurred. If detraining includes 3 or 6 month time period, it is shown that physiological features in individuals are regressed to exercise beginning time (4).

Generally, detraining is occurred in individuals doing already regular exercise practices during a few week or month and then giving breaks (29). Ratio of detraining impacts is altered as break length given training and bio motoric features type (4).

Detraining has two effects as physiological and physical features. Physiological effects are changes which are seen at heart-vascular and respiration system. As to physical effects are changes which are occurred muscle strength and power, muscular endurance, speed, flexibility, agility and body composition (21).

Detraining is revealed as breaks (intervals) given training at to become disabled, injury or middle of season and end of season (17,20).

Regardless of cause of breaks, even if they are low intensity, physical activities should be made to decrease minimum level of loss of physiological and physical occurred in the end of detraining. There are studies in literature showed that athletes aren't affected by detraining even if they continue to do training at low intensity in periods given break trainings (25).

In committed studies related detraining, generally it is insisted on performance loss that athletes experience. In this study, it is investigated that the effect of 20 days break, given by considering semester holiday, on 10-12 age female basketball' sportive performances.

MATERIAL & METHOD

11 female basketball players, having mean 11.45±0.82 year age, mean 147.27±7.29 cm height, mean 39.65±6.20 kg body weight, mean 2.00±0.44 sport age, participated to research voluntarily. Gülcü Primary School star female basketball team, doing training 3 days in a week during 6 months and gaining championship in Isparta Primary School competitions, was taken to study. Team was taken to re-tests after last group match and later a break was given training. Second measurements were made 20 days later. Pre-test and re-test measurements were taken two each days and 09-12 time before midday. In first measurement days, athletes' rest pulse, vertical jump height, handgrip strength and aerobic endurance as well as anaerobic capacities at second measurement days were measured to determine performance changes of athletes.

In first measurement days, 15 minutes warm up exercise was performed to athletes after rest pulse measurement was taken. In second measurement days, in addition 15 minutes warm-up exercise, 3 minutes warm-up was performed on bicycle before Wingate anaerobic power test was started. Day, time and place of first measurement were said to athletes after last group match and they were warned regarding that "you should come rested situation to measurement, you should continue normal nourishment habits, and you should keep away foods including caffeine". It was said that second measurements will be performed about 3 weeks later and it is required that you don't any training or exhaustive activities to be exhaust themselves. Second measurement' day, time and place was said to athletes before 3 days ago from measurement and it is reminded what things will be noticed.

Number of Rest Pulse (NRP): After pulse control clock was worn to athlete, she lain down to upon plates mattress with 10 minutes span. Pulse value in the end of 10 minutes rest was recorded. Pulse value was measured by Polar RS-400 brand pulse control clock before warm-up.

Vertical Jump (VJ): VJ was measured by Takai brand jump meter. Athlete stood at steep position on plate. When hands were on waist, athlete jumped to

steep. Three trials were performed and later the best score was recorded (7).

Handgrip Strength (HS): Measurements were made by Takei brand hand dynamometer. Athlete stood at step position and her hands were at lateral situation. Dynamometer was held with dominant hand in position near body. Dynamometer was gripped by not moving hand. 3 trials were performed and later the best score was recorded (22).

Aerobic Endurance (AE): Queens College Step test protocol was applied to measure AE. Athlete ascended-descended upon platform, its height is 41.3 cm, 22 times in company with metronome arranged 88 hits. Test was continued during 3 minutes. Pulse value between 5th and 20th seconds was taken after test was finished (12). VO_2 max value was calculated by placing pulse value to formula developed by McArdle et al. (14).

Anaerobic Capacity (AC): AC was determined with Wingate anaerobic power test. Maximal load during 30 seconds was performed on Monark Ergometer in load arranged for children (35g/kg). In the end of test, maximum anaerobic capacity (mean power) was recorded (23).

SPSS 15.0 for Windows Package program was used for data evaluation. Descriptive statistics and Wilcoxon sign test were used in data evaluation. Results were accepted significant at $p<0.05$ level.

RESULTS

Table 1. Participants' minimum, maximum, mean values and the relationship between pre-test and re-test

		n	Min	Max	X±SD	p
Rest Heart Rate	Pre-test	11	72,00	96.00	82.90±7.25	P<0.05
(Beats/min)	Re-test	11	79.00	103.00	89.54±7.95	
Vertical Jump (cm)	Pre-test	11	41.00	62.00	47.18±5.61	P<0.05
	Re-test	11	36.00	46.00	39.90±3.14	
Handgrip Strength	Pre-test	11	8.30	23.40	15.58±4.75	P>0.05
(kg)	Re-test	11	9.20	24.00	15.79±4.75	
Aerobic Endurance	Pre-test	11	32.56	39.95	37.14±2.46	P<0.05
($ml/kg^1/min^1$)	Re-test	11	31.45	39.21	35.93±2.81	
Anaerobic capacity	Pre-test	11	144.20	624.40	370.90±161.39	P<0.05
(watt)	Re-test	11	57.60	615.20	352.83±173.96	

DISCUSSION

In our study, it was found that rest pulse values were increased from pre-test to re-test significantly. This situation showed that 3 weeks detraining process cause a reduction of heart efficiency. When we examined research results existing in literature, we observed Mujika and Padilla (15) determined that reductions in heart-vascular system were occurred after detraining. In another research, it was observed that heart efficiency was declined toward pre-level of beginning training after resting period given to athletes (24).

In a study that the effects of detraining were examined in athletes participating to swimming sport, it was found that significant level declines at $MaxVO_2$ values were occurred after one month detraining process (18). Results, which were appeared in a lot of study examining the adverse effect of detraining on heart efficiency and pulse volume, support "result that heart efficiency and rest pulse were affected by detraining" which was our research result.

In committed this study, it was observed that athletes' aerobic endurance values were decreased significantly after 20 days detraining. It may be said that declines of athletes' aerobic endurance was originated from decrease at heart efficiency. It was determined that $MaxVO_2$ value was declined depending decreases at heart flow and pulse volume with increases at exercise pulse after detraining.

When we evaluated similar study research existing in literature with this study committed by us, it was showed that a decline at $MaxVO_2$ value which is an important indicator of aerobic endurance was occurred after two weeks detraining periods (1,26).

In this study, it was established that athletes' vertical jump performances were decreased from pre-test to re-test significantly. Vertical jump is a measure to determine individual' explosive strength and anaerobic power features. It revealed the result that there were significant losses at athletes' leg strength that decreases at athletes' vertical jump performance were occurred after three weeks detraining period.

Usually depending on the disability, not to exercise a certain period of time and consequently the formation of muscle atrophy causes loss of strength. Strength loss in these parts is increased at same ratio as long as stagnancy in injury/disability parts is lengthening (13). In her study examining the

effects of detraining at different age group and different sport branches, Özdöl (20) determined that decreases at significant level were occurred at shuttle and standing long jump performances.

As to a study committed on adult individuals, it was determined that significantly decline was occurred in muscle strength gained in the end of 13 weeks training period after 5 weeks detraining period (19). In another study, it was determined that significantly decline was occurred in maximal strength values at trained athletes after 5 weeks detraining period, too (6). In a lot of committed study, it was indicated that declines at significant level were occurred in athletes' strength values (3,8).

It was established that decreases at significant level were occurred at anaerobic power values after 20 days detraining period.

Accompanying committed studies showed that improvement at anaerobic capacity with trainings performed to children was occurred (16), it is known that decreases are occurred at enzymes contributing endurance improvement quickly after breaks given to trainings. Therefore, we may say that decreases at anaerobic power values of athletes doing regularly training will be occurred. So and so, in similar studies existing in literature it was found that decreases at significant level were occurred at athletes anaerobic power values in detraining process which was performed after regular training periods (4,21). Our study result supports this opinion.

According to our study results, it was determined that no decline was occurred at handgrip strength from pre-test to re-test. Reason of this situation may be explained with development features of children. Because, knowledge indicating serious strength loss at children don't occurred even if trainings are broken and these knowledge showed that strength acquisition at children shows permanent features and when compare adults (16). In addition, in some committed studies it was expressed that strength feature protects itself during 4 week after break is given to training (15). As to another reason of protection of handgrip strength may be explained that children use their hand in daily life frequently.

As a result, it was established that significantly increases at pulse, significantly decreases at $MaxVO_2$ values, anaerobic capacity and vertical jump performance, notwithstanding there was no statistically significant change at handgrip strength. We may say that disability, injury or season passing period effect on some decreases at athletes' physical and physiological performance features were occurred. So, determining which ratio athletes are affected by detraining, trainings should be started considering these effects in the trainings' beginning phase after a long time break period. In addition to this, it is required that school team intending success should know that break to training has a negative effect on performance and they should arrange training program by including semester holiday. If athletes can't do training together in semester holiday, doing training in semester holiday should be advised to athletes by preparing individual training program by physical education teacher or trainer.

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