The Training Effects of a Six-week Basketball Programme on Selected Physiological Parameters of Male Secondary School Students

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ABSTRACT

The training effects of two summer basketball training programmes with different exercise intensities on male secondary school students of different fitness levels were investigated. Male students aged 14 to 17 years of different fitness levels were randomly assigned to participate in six-week summer basketball training programmes of either moderate or high exercise intensity. Control groups of different fitness levels were recruited simultaneously, but they did not perform any significant exercise during that period. Maximal oxygen consumption, peak anaerobic power, mean anaerobic power, resting heart rate and resting blood pressure were measured immediately before and after the programmes. A 2 (pre-training measurement and post-training measurement) x 2 (high fitness and low fitness) x 3 (high intensity training, moderate intensity training and control) ANOVA was used to assess the effect of different fitness levels and exercise intensities on each of these parameters. 57 subjects from the training groups and 25 subjects from the control group completed the study. $\dot{V}O_{2\text{max}}$ increased from 52.96 ± 6.43 ml.kg$^{-1}$.min$^{-1}$ to 55.67 ± 5.71 ml.kg$^{-1}$.min$^{-1}$ for the high intensity training group, increased from 54.49 ± 6.28 ml.kg$^{-1}$.min$^{-1}$ to 55.63 ± 6.71 ml.kg$^{-1}$.min$^{-1}$ for the moderate intensity training group, and decreased from 53.12 ± 7.38 ml.kg$^{-1}$.min$^{-1}$ to 49.71 ± 6.45 ml.kg$^{-1}$.min$^{-1}$ for the control group. Significant differences in $\dot{V}O_{2\text{max}}$ were found between control group and high intensity training group ($p < .05$), and between control group and moderate intensity training group ($p < .05$). Peak anaerobic power increased from 14.11 ± 1.90 W.kg$^{-1}$ to 16.23 ± 1.69 W.kg$^{-1}$ for the high intensity training group, from 14.33 ± 1.53 W.kg$^{-1}$ to 15.09 ± 1.40 W.kg$^{-1}$ for the moderate intensity training group, and from 13.98 ± 1.85 W.kg$^{-1}$ to 14.09 ± 1.93 W.kg$^{-1}$ for the control group. Significant differences in peak anaerobic power were also found between control group and high intensity training group ($p < .05$). No significant differences were found on mean anaerobic power, resting heart rate and resting blood pressure between different groups. Participation in a 6-week summer basketball training programme for 120 minutes three times per week would improve fitness. Since inactivity for a 6-week period could lead to deterioration in physical fitness, it was recommended that regular physical activity during summer should be provided. A programme of 120 minutes three times per week of moderate intensity training (about 51% of heart rate reserve) should be adequate in maintaining and improving physical fitness.

Keywords: basketball training, aerobic and anaerobic fitness, resting heart rate, resting blood pressure, inactivity
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