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The effect of developing the explosive power and speed endurance on promoting some kinematical and physiological characteristics for 400 m hurdles runners

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The gap between the Egyptian and international records increased in 400 m hurdles race where the Egyptian record is 49.74 sec and the world record is 47.50 sec which reflects the malfunction of the training process. This pushed the researchers to perform this study to state the reasons beyond the failure of Egyptian national team players to promote and develop their levels to cope with the international levels. Pilot studies stated that fatigue is the main reason for the weak records due to performing the hurdle skipping skill repeatedly and it appears clearly before the end of the race. Fatigue helps in decreasing the efficiency of the physical and functional abilities which affects the whole performance negatively; this is why the researchers found that it is necessary to develop the explosive power and the specific endurance to help in delaying fatigue according to previous researches that tried to investigate the same problem in other races as researchers proved that the deficiency in speed and explosive power are the most important negative factors that affects the records of speed races. The experimental method was applied on 2 groups (n = 16) each consisted of 8 athletes where the recommended training program was applied on the experimental group and the normal training routine was applied on the control group after taking the pre-measurements. The kinematical variables that were measured: pivoting time and distance – horizontal and vertical velocity – length of skipping step – time of race – total number of race steps – time for each 100 m in the race. The functional variables were: VO_{2\text{max}} – blood pressure – resting and performance pulse – blood pressure – O2 pulse – lactic acid rates in blood. After applying the training program, post-measurements were taken under same conditions of the pre-measurements then proper statistical processing methods were used to analyze research variables. The most important results showed that developing the explosive power and speed endurance had a positive effect on developing the numerical records due to promoting the kinematical and physiological characteristics of the research sample with a percentage of 38% for kinematical variables and 24% for physiological variables. This is why the researchers recommended that applying similar programs on 400 m hurdles runners is necessary to develop their kinematical and functional abilities. Also further studies should be performed to help in developing numerical records for other races.

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