

Effects of different arm kinematics on performance in long distance running

Mwangi, Francis M.; Wanderi, Peter M.; Wamukoya, Edwin K.; Vincent, O. Onywera; Gitonga, Elijah R., 2011

Arm action should be efficient as it generates various components of running mechanics. While many authors recommend that the arms should be moved with elbows held at about 90 degrees, some distance running athletes have used different arms movements with varying degree of success and failure during competitions. The study investigated how different arm kinematics affected cardio-respiratory parameters and stride patterns during the steady phase of long distance running. Mean values of working heart rate (WHR), estimated percentage of maximum oxygen consumption (%VO₂ max), ventilation rate (VR), and rating of perceived exertion (RPE) were used to estimate energy cost of running with different arm actions. Ten elite Kenyan distance running athletes were tested in ten submaximal treadmill trial runs, each trial performed with different arm action for 15 minutes at a speed corresponding to individual's 80% running effort. Repeated Measures ANOVA indicated significant difference in WHR, %VO₂ max, RPE, and stride rate (SR) at $p < .05$. Medium effect size was observed; Omega Squared (ω^2) = .20. Arm action consisting of about ± 20 degrees oscillation of the hands around 90 degrees angle at the elbow is more efficient than running with arms held at 90 degrees angle at the elbows.