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Prediction of Marathon Race Time from Physiological and Training Characteristics of Male Recreational Runners

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Main Goal of the Study

- To examine the role of training and physiological characteristics on the performance of recreational marathon runners.

Methods

- recreational male marathon runners (n=125)
- finishers of the Athens classic marathon 2017
- series of anthropometry and physical fitness tests including body mass index (BMI), percentage body fat (BF), maximal oxygen uptake (VO_2max), sit-and-reach test (SAR), isometric muscle strength assessed as the sum of four tests: right and left handgrip, trunk and legs dynamometry divided by body mass, squat jump (SJ) and countermovement jump (CMJ)

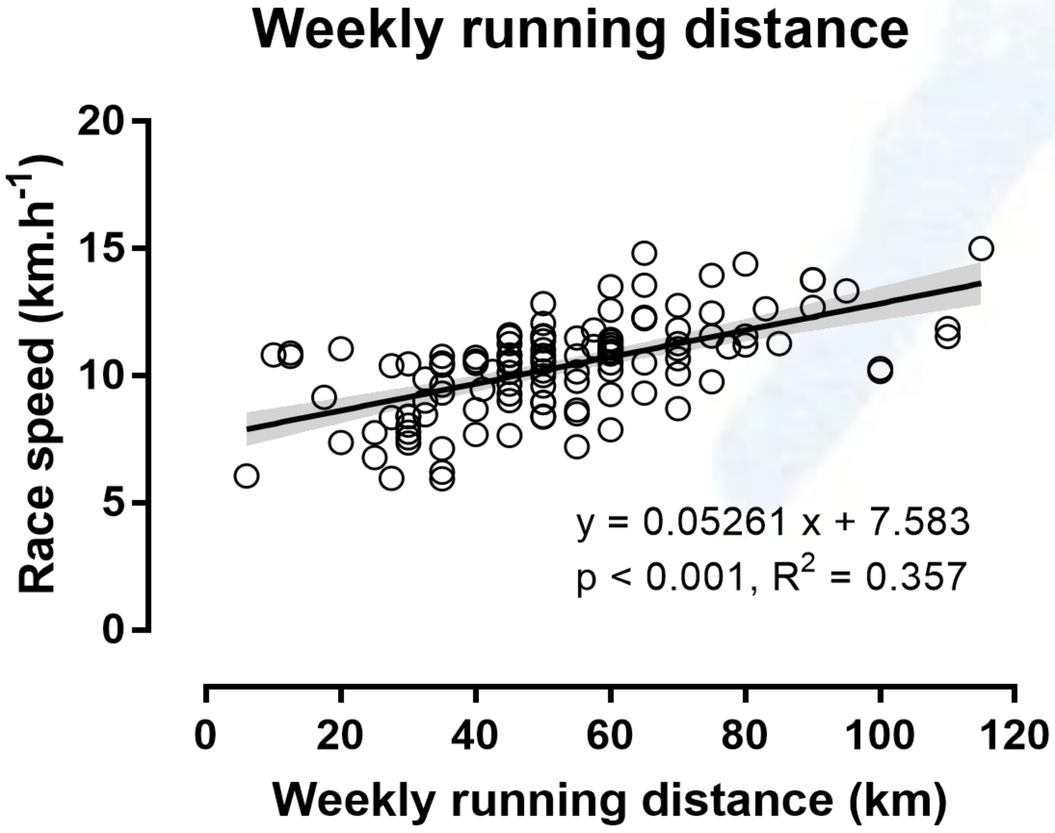

Figure 1. *Variation of race speed by weekly running distance.*

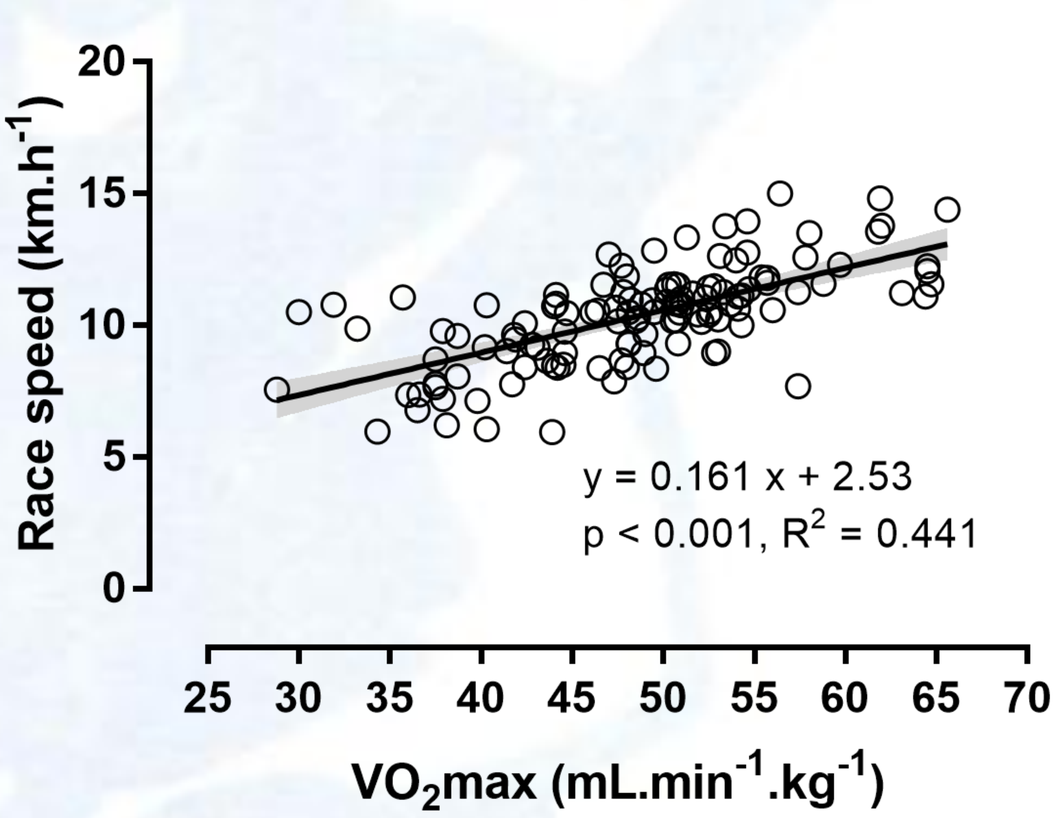

Figure 2. *Variation of race speed by maximal oxygen uptake (VO_2max).*

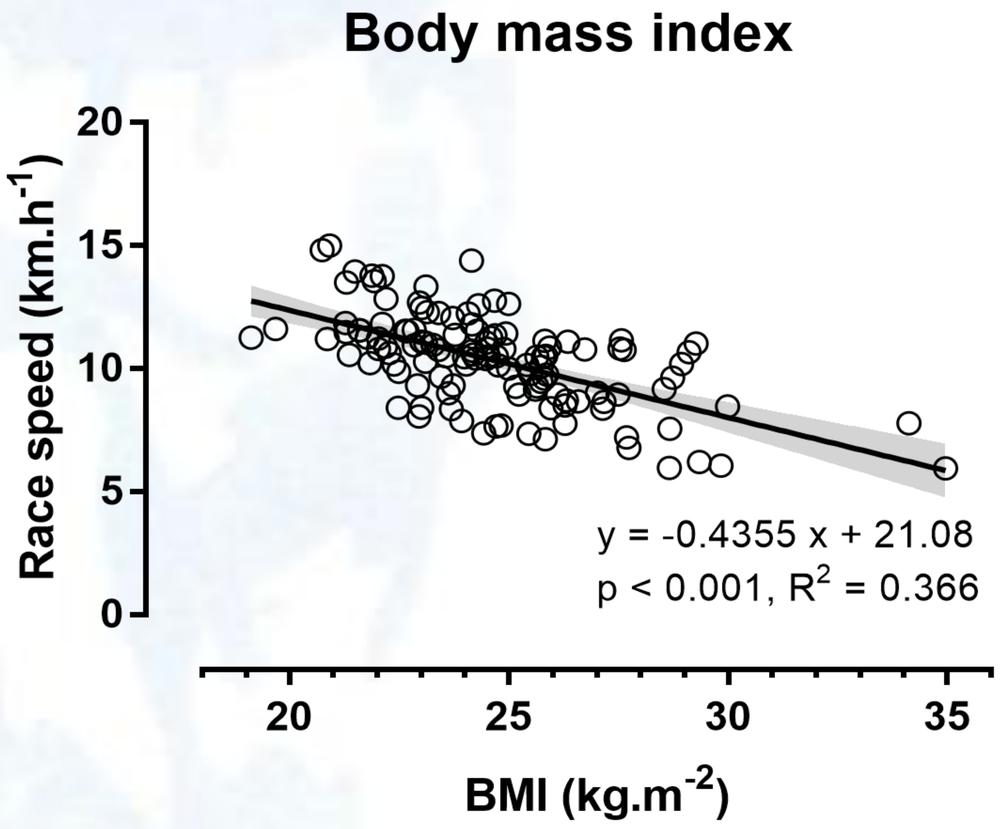

Figure 3. *Variation of race speed by body mass index (BMI).*

Results

Running speed during the race correlated moderately with age (r=-0.34, p<0.001), and largely with the number of weekly training days (r=0.53, p<0.001) and weekly running distance (r=0.59, p<0.001), but not with the number of previously finished marathons (r=0.07, p=0.229). With regards to physiological characteristics, running speed correlated largely with body mass (r=-0.52, p<0.001), BMI (r=-0.60, p<0.001), BF (r=-0.64, p<0.001), VO_2max (r=0.66, p<0.001), moderately with isometric muscle strength (r=0.42, p<0.001), but not with SAR (r=0.08, p=0.187), SJ (r=0.11, p=0.119) and CMJ (r=0.11, p=0.122). Race speed could be predicted (R2=0.63, standard error of the estimate=1.14) using the formula '8.76+0.101× VO_2max +0.031×weekly training distance in km-0.201×BMI'.

Main Findings

- These findings highlighted the role of aerobic capacity, training and body mass status in the performance of recreational male runners in a marathon race.
- Considering the increased number of recreational runners competing in marathon races[1,2], the findings could be of great practical importance for coaches and trainers.
- In conclusion, a fast marathon race was associated with high VO_2max, long weekly training distance and low BMI.

References

1. Knechtle, B. et al. (2019). PLoS One. 14(3):e0212797.
2. Vitti, A. et al. (2019). Res Sports Med. doi: 10.1080/15438627.2019.1586705.

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