

Is underwater gliding test a valid procedure to estimate the swimmer's drag?

Jorge E. Morais^{1,7}, Sérgio Jesus^{2,7}, Jean E. Mejias^{3,7}, António J. Silva^{4,7}, Daniel A. Marinho^{5,7}, Tiago M. Barbosa^{6,7}

¹Department of Sport Sciences, Polytechnic Institute of Bragança/Portugal;

²Department of Sports Sciences, Polytechnic Institute of Bragança/Portugal;

³Department of Sports Sciences, Polytechnic Institute of Bragança/Portugal;

⁴Department of Sports Sciences, University of Trás-os-Montes and Alto Douro/Portugal;

⁵Department of Sports Sciences, University of Beira Interior/Portugal;

⁶Department of Sports Sciences, Polytechnic Institute of Bragança/Portugal;

⁷Research Centre in Sports, Health and Human Development, Vila Real, Portugal
morais.jorgestrela@gmail.com, sergiodesporto@gmail.com, jean.eg.mejias@hotmail.com, ajsilva@utad.pt,
marinho.d@gmail.com, barbosa@ipb.pt

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INTRODUCTION A higher underwater gliding distance seems to be associated to a decrease of the passive drag (Marinho et al., 2010). But it also can be related to other variables such as muscle power of the lower limbs, while pushing the forehead wall. At least one paper reported that during turns, muscle power from lower limbs is a determinant factor (Potdevin et al. 2011). The aim of this study was to develop a structural equation model for underwater gliding distance based on these selected variables.

MATERIALS AND METHODS Twenty three subjects (twelve boys and eleven girls with a mean age of 13.61 ± 0.83 years old) were evaluated. It were determined: (i) the underwater gliding distance; (ii) the Squat Jump performance; (iii) the passive drag; (iv) the passive drag coefficient; (v) the trunk transverse surface area and; (vi) the gliding velocity.

RESULTS Underwater gliding distance was significantly correlated with Squat Jump ($r_s = 0.43$; $p = 0.038$) but not with passive drag ($r_s = 0.18$; $p = 0.402$). Squat Jump had a higher direct effect ($\beta = 0.42$; $p \leq 0.05$) to underwater gliding distance than passive drag. Overall model explained 30% of the underwater gliding distance ($x^2 = 26.946$; $x^2/df = 3.849$; SRMR = 0.207).

CONCUSSIONS As a conclusion, there are some other variables not considered for this model that might have significant influence in the underwater gliding distance. In this sense, it seems that the underwater gliding test is not representative of the swimmer's passive drag.

References

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