

The effect of upper and lower limb fat percentages on the performance of butterfly stroke in under-19 national level male swimmers

Perera A. H. C.^{1*}, Manawadu K. P.¹

¹*Department of Sports Science, University of Sri Jayewardenepura, Gangodawila, Nugegoda, Sri Lanka*

Swimming can be categorized in to four major styles, i.e., breaststroke, back stroke, butterfly stroke and front crawl. Current Sri Lankan Swimming shows great improvements in butterfly stroke with respect to the world level. This study has focused on butterfly stroke performances with upper and lower limb fat percentages. Apart from high performances, coaches always have a secondary objective to decrease the amount of fat. Therefore, this study was carried out to explore the impacts of body fat on butterfly stroke performances. In this study, thirty (30) under-19 national swimmers were selected randomly and were asked to perform the 50m butterfly with jump start and data was collected using observational method on under-water distance, number of underwater kicks, stroke count and time taken to complete the 50m course. Then the body fat percentages were measured by using a bio-impedance analyzer. According to the analysis, underwater distance per kick (Mean = 1.12m \pm 0.19, range 0.72–1.47 m, $r^2 = 0.72$, $p < 0.01$) and when stroke frequency (Mean = 0.854 \pm 0.131, range 0.798–0.897) added to the model, r^2 explained 0.85 variance. These two parameters were the major contributors for high performances. Moreover, underwater performances had a critical impact on 50m Butterfly Swim time ($r = 0.86$, $p < 0.01$). Furthermore, results showed that to have a better performance underwater, it is ideal to maintain upper limb fat percentages between 17 and 22, and lower limb fat percentage between 15 and 21. To have a better surface swimming performance it is better to maintain an upper limb fat percentage within the range 18–22. Finally, it was concluded that both underwater and surface swimming performance variables had mixed impacts on overall performances.

Keywords: *Butterfly stroke, upper limb, lower limb, performance, fat percentage*

*Corresponding author: hasith@sjp.ac.lk