

Analysis of Factor on Development of performance in Young Swimmers

Watanabe, M., Takai, S. (Graduate School of Comprehensive Human Sciences, University of Tsukuba)

Summary

Children start to train for the competitive swimming from early age. This makes attain their high performance at early childhood. In their background, coaches tend to impose hard training for children without considering the physical maturity status. The consideration for the physical maturity is necessary to impose the adequate training. Furthermore, it is essential to reveal factors affecting swimming performance and developmental pattern of the children.

PURPOSE: We aim to quantify contribution of effective factors to the performance at various stages of physical maturity, and then clarifies their developmental patterns in young swimmers.

METHODS: The participants were 172 boys and 211 girls aged 8 to 18 years old having regular training (3 times or more per week) at their swimming clubs. Their maturity status was classified into three stages as early adolescence, late adolescence and young adulthood according to their velocity curves of height. Given that body size, muscle strength, flexibility and stroke efficiency strongly affected swimming performance, a factor analysis was applied to 11 measurements, then factor scores related to body size, muscle strength and flexibility were extracted. We applied simultaneous analysis of multiple groups to the multiple regression models of stroke efficiency (stroke index / height) and the three variables from factor analysis for each sex and maturity stage to explain the swimming performance represented by the relative record to standardized 50m record.

RESULTS: Boys showed the stroke efficiency as the most effective parameter to explain swimming performance only at early adolescence, and muscle strength became the most effective parameter after late adolescence. Girls showed the stroke efficiency as the most effective parameter to explain

swimming performance throughout maturity stages, moreover, body size was more effective in young adulthood.

CONCLUSION: These results suggest higher contribution of stroke efficiency in early adolescence, but lower contribution of body size and muscle strength in early stage. Thereafter, the stroke efficiency occupied less important position, but body size and muscle strength did more important position to account the swim performance.

52nd Annual Meeting American College of Sports Medicine
Gaylord Opryland Resort and Convention Center, Nashville, Tennessee.
June 1-4, 2005