Comparison of body mass index between swimmers and non-trained individuals with down syndrome

Ines Aleixo [2], Susana Vale [2], Pedro Figueiredo [2], Rui Corredeira [1], Adilia Silva [1] and Ricardo J. Fernandes [1]
[1] University of Porto.Faculty of Sport. CIFI2D. Portugal, [2] University of Porto.Faculty of Sport. Portugal

OBJECTIVE Overweight and obesity are predisposing factors for the development of several debilitating diseases. A standardized estimate of an individual's relative body fat assessed from his height and weight - the Body Mass Index (BMI) - has become a useful and simple measure to estimate overweight and obesity. Moreover, studies report that obesity is prevalent in individuals with Down Syndrome. The purpose of the present study was to compare the BMI between Down Syndrome competitive swimmers and non-trained Down Syndrome individuals.
METHODS Six swimmers (19.8 ± 4.5 years old, 2.5 ± 2.0 years of training background, 5.2 ± 1.2 training units per week - being each unit composed of 1.4 ± 0.2 h of water training and 0.9 ± 0.4 h of dry land training, namely flexibility and/or weight lifting), from the Down Syndrome Portuguese swimming team and 10 Down Syndrome non-trained individuals (19.6 ± 2.9 years old) were evaluated. The assessed anthropometric characteristics were height and weight, from which BMI was calculated [BMI = (weight (kg) / height (m)2]. A non-parametric Mann-Whitney test was used to compare the anthropometric differences between the swimmers and the non-trained individuals (a significance level of $p \leq 0.05$ was accepted).
RESULTS Mean and SD values of weight, height and respective BMI were: (i) 58.4 ± 14.1 kg, 154.3 ± 12.1 cm and 24.3 ± 4.1 BMI for the swimmers' group and (ii) 74.3 ± 8.1 kg, 143.4 ± 9.5 cm and 36.8 ± 5.3 BMI for the non-trained group. As expected, differences between the two groups were observed in weight ($p = 0.016$) and BMI ($p < 0.001$).
DISCUSSION & CONCLUSION In fact, the higher BMI in non-trained group seems to indicate that a sedentary way of life contributes to obesity. Indeed, subjects with Down Syndrome that are physically active (involved in regular swimming practice) had a BMI in normal weight score for the general population, being, nonetheless, higher when compared with swimmers without disability. Therefore, regular competitive swimming training seems to be significant to achieve a fit weight among Down Syndrome population, being advised their increasing participation namely for health purposes.
KEY WORDS Down syndrome, adapted swimming, obesity, BMI

Stability of patterns of behavior in the butterfly swimmers

H. Louro [1], A. Silva [3], M.T. Anguera [2], O. Cameirno [2], C. Oliveira [2], A. Conceição [1] and J. Campaniço [3]
[1] Sports Sciences Research Laboratory, Sport School of Rio Maior, Polytechnic Institute of Santarém, Portugal, [2] University of Barcelona. Project: Technological and methodological advances in the automation of observational studies in sport (psi2008-01179), [3] University of Trás-os-Montes and Alto Douro, Vila Real, Portugal

OBJECTIVE The purpose of this study was to find patterns in the swimming technique of butterfly, with an adaptation of the Behavioral Observation System Tech. This, as a instrument for ad-hoc qualitative analysis enables the study of the stability of the technical implementation, an applicant in optimization sport. When used in the training of swimmers, can turn, reduce the variability in behavioral tuning technique of swimming. Through the analysis of temporal patterns (T-pattern) and a sequence of five cycles run at maximum speed hand, studied the behavior of four technical elite swimmers in Portuguese, with a record 259 alphanumeric codes and a total 160 configurations. The structure of the original instrument based on a mixed system of categories and formats Field, which can record technical features observed during the execution of hand cycles. The validity was ensured through the index of intra-observer reliability (95%) and inter-observer accuracy (96%). To detect patterns exist, each swimmer, using the Theme 5.0 software, which allowed to identify the stable structures of technical performance within a critical interval of time ($P < 0.05$) - t-patterns.
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RESULTS The patterns were different, adjusting to the characteristics of technical implementation of the swimmers. Found that the swimmer can make settings with different levels of complexity of structure, depending on the implementation of changes within the hand cycle. Variations of codes in each configuration obtained using the SOCTM,

determine the differences between swimmers.
DISCUSSION & CONCLUSION However, the records show a clear behavioral similarity compared the result with a general pattern of the butterfly technique. Conclusion: As we can see that the potential quality of this instrument is evident by the patterns obtained from a temporal sequence.
KEY WORDS Technical Analysis, Patterns, Butterfly, Chronology

Kinematical constrictions during breaststroke swimming with a portable gas analyzer snorkel

V. Reis [3], A.J. Silva [3], T. Barbosa [1], J. Brito [2], A. Reis [3], H. Louro [2] and A. Conceição [2]
[1] Polytechnic Institute of Bragança, Bragança, Portugal, [2] Polytechnic Institute of Santarém, Santarém, Portugal, [3] University of Trás-os-Montes and Alto Douro, Vila Real, Portugal

OBJECTIVE To determine the kinematical constrictions in maximal breaststroke swimming bouts with the AquaTrainer® snorkel (Cosmed, Rome, Italy).
METHODS Seven national level breaststrokers performed two maximal bouts of 100-m swims (separated by 48 hours): (i) one bout connected to the AquaTrainer® snorkel (constricted swim); (ii) one bout without the snorkel (free swim). The swims were videotaped in sagittal plane with a pair of cameras providing a dual projection from both above and underwater. The study comprised kinematical analysis of stroke cycles using APAS and a VCR (f = 50 Hz). To create a single dual projection image, the independent digitalization from both cameras was reconstructed with the help of a calibration volume and a 0.01). The±2D-DLT algorithm. Digitalization reliability was high (ICC=0.97 following measures were assessed: (i) swimming performance (T100); (ii) stroke parameters (stroke cycle period, stroke rate, stroke length and mean swimming velocity); (iii) estimated swimming efficiency by the swimming index; (iv) speed fluctuation (dv) and the mathematical characterization of dv. Mean dv curves normalized to time were computed with MATLAB. The polynomial regression (7th power) between dv and normalized duration of the full stroke cycle was calculated. Wilcoxon tests were performed to compare significant differences in the dependent variables (performance, stroke mechanics and efficiency variables) according to the independent variable (free versus constricted swim) ($P \leq 0.05$).
RESULTS T100 was significantly higher for constricted swimming than in free condition (6.26%; Z=-2.366; P=0.02). The remaining variables showed no significant differences between the two swimming conditions. In both exercise conditions, dv was characterized by a bi-modal profile. The determination coefficients for the dv mathematical model were significant ($P<0.01$) and 0.47.
DISCUSSION & CONCLUSION None of the stroke mechanics and efficiency variables evaluated presented significant differences between both swimming conditions. The AquaTrainer® constrictions might be related mainly to the start and turn phases. *(Supported by FCT grant: POCI/DES/58362/2004)*
KEYWORDS Kinematical constrictions, swimming performance, stroke parameters, AquaTrainer snorkel, breakstroke

Relation between energy expenditure and time spent in physical activity and fitness in middle age adults

Marjeta Misigoj-Durakovic [1], Zijad Durakovic [2] and Maroje Soric [1]
[1] Faculty of Kinesiology University of Zagreb/1Dept. of Kinesiological Anthropology, Zagreb, Croatia, [2] Institute for Anthropological Research/Dept. of Medical Anthropology, Zagreb, Croatia

OBJECTIVE Physical fitness is often considered as a good measure of individual physical activity. The aim of the study was to assess the relations between energy expenditure and time spent in physical activity of different intensities and aerobic fitness indicators in adults.
METHODS In the sample consisted of employed urban living adults (31 men and 20 women aged 40±3.7 years). Relation between energy expenditure and time spent in physical activity (PA) and fitness were analyzed. Energy expenditure (EE)-total relative EE (TEErel) and relative EE during PA (AEErel), and the time spent sedentary and in low (1.5-3MET) moderate (3-6MET) and high (> 6MET) intensity PA was measured by combined system Sense Wear Armband™ (Body Media, Pittsburgh, PA) during seven consecutive days. Aerobic fitness indicators – maximal oxygen uptake (VO_2maxrel), aerobic threshold ($V0_2$AT) and anaerobic threshold (VO_2AnT) were determined during direct treadmill spiroergometric testing using K4 Cosmed equipment.
RESULTS To reveal the relations between EE and aerobic fitness indicators Pearson's partial correlations controlled for gender were calculated. The results showed significant positive correlations between the EE indicators (total and EE