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BOOK OF ABSTRACTS

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ARTERIAL STIFFNESS AND PHYSICAL FITNESS IN PUBERTY

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PURPOSE: Arterial stiffness progressively increases with aging. The high level of arterial stiffness is an independent risk factor of cardiovascular disease (1). Higher levels of physical fitness, especially cardiorespiratory fitness are associated with delay of age-related arterial stiffening in adults. Yamamoto et al. recently reported that arterial stiffness was significantly correlated with flexibility in middle-aged and elderly people, but there was no such correlation in young people. The purpose of the present study was to clarify the correlation between arterial stiffness and fitness (muscular strength and flexibility) in puberty.

METHODS: 72 Japanese adolescents participated in this study (40 boys and 32 girls). We measured their height, body weight, blood pressures, arterial stiffness, muscular strength (handgrip test) and flexibility (sit-and-reach test). The arterial stiffness was measured by the pulse wave velocity between brachial and ankle arteries (baPWV). We examined the relationship between fitness and baPWV. RESULTS: The handgrip strength of boys indicated a significant positive correlation with their height, weight and systolic blood pressure. It is possible that the relationship between handgrip strength and blood pressure is associated with an increase in muscle mass, blood volume and sex hormone secretion with growth development. We speculate that the flexibility and baPWV were unconcerned because artery in pubertal child were distensible enough. In conclusion, the present results indicate that arterial stiffness is not associated with muscular strength and flexibility in puberty. (The Ministry of Education, Culture, Sports, Science and Technology, Grant-in-Aid for Research Activity Start-up 23800070)

PHYSIOLOGICAL RESPONSE, ENJOYMENT AND RATE OF PERCEIVED EXERTION FOLLOWING A BOUT OF INTERACTIVE GAME CYCLING AND CONVENTIONAL CYCLING IN ADULTS

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Introduction Physical inactivity is the fourth leading risk factor for global mortality (WHO, 2010). Though sedentary behaviour is a modifiable risk factor for a myriad of chronic diseases, adult physical activity levels remain low. Innovative approaches are required to reverse these behaviours and increase daily energy expenditure. Interactive video games have become popular in recent years but it is not clear how they compare with conventional exercise. The purpose of this study was to compare cardiovascular, metabolic, perceptual and enjoyment responses between one bout of conventional cycling and one bout of interactive game cycling at a matched workload. Methods Thirty four healthy subjects (sixteen women and eighteen men) volunteered for this study. Peak oxygen uptake (VO2peak) was measured using an incremental cycling test and subjects were familiarised with the cycling game prior to testing. Subjects carried out a 30 min interactive cycling trial and a 30 min conventional cycling trial at 55% of peak power output, in random order, with at least 2-days between trials. During the trials, VO2 was measured using a metabolic system (Innovision Ltd, Odense) and heart Rate (HR) was measured by radiotransmetry. These measures were used to calculate heart rate reserve (HRRI), VO2 Reserve (VO2R), the rate of energy expenditure (REE) and MET’s. Rate of Perceived Exertion (RPE) and enjoyment were measured every 10 minutes with Borg scale and a modified PACES scale. Results Interactive cycling resulted in a significantly greater VO2R (68.31% ± 10.12% vs 64.9% ± 9.6%), REE (8.8 ± 1.9 vs 8.47 ± 2 kcal/min), MET (7.1 ± 1 vs 6.8 ± 1) and enjoyment (27.2 ± 6.1 vs 17.1 ± 5.7), p<0.05. No significant differences between interactive cycling and conventional cycling were found for HRRI (72.5 ± 10.4 vs 71.4±10.1%) and RPE (13.1 ± 18 vs 13.2 ± 17). Discussion The main finding of this study was that interactive cycling resulted in significantly higher metabolic responses and energy expenditure. Interactive game cycling did not result in higher perceptual ratings of effort and was deemed more enjoyable. Interactive cycling games can be a valid alternative to conventional exercise since they result in a higher intensity of effort and have higher enjoyment ratings. References 1. War-