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Editorial

The Influence of Physical Activity on Obesity and Health

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The eleven articles featured in this issue are grouped into 3 categories based on their topic: (a) complications of obesity, (b) biological effects of physical activity/exercise training on body composition and health related factors, and (c) behavioural aspects related to physical activity and exercise.

To highlight some of the findings and with regards to the first topic, M. J. Duncan and M. Stanley report that the functional movement score is negatively correlated with BMI in 10-11-year-old British children. The authors concluded "Scientists and practitioners ... need to consider interventions which will develop functional movement skills alongside physical activity and weight management strategies in children in order to reduce the risks of orthopaedic abnormality arising from suboptimal movement patterns in later life". The paper from E. Aadland and L. Robertson focuses on the understudied subject of physical activity on severely obese individuals. It is somewhat surprising that this population, that could benefit a lot from being physically active, does not yet have a specific set of guidelines. The data from this study shows that physical activity is mostly associated with weight change in men while it was mostly associated with changes in cardiorespiratory fitness (CRF) in women. The study by D. M. Baur et al. was designed to describe the CRF levels of professionally active career firefighters across different age groups with the objective to determine effect modification by physical activity and BMI levels. Their original results confirm that CRF in career firefighters is significantly reduced with increasing age and clearly show for the first time in this population that the age-related decline in CRF is highly dependent on BMI and physical activity habits. For older adults with knee osteoathritis (OA), knee pain is associated with difficulty in walking, while obesity is also associated with difficulty in walking and low levels of physical activity and is a primary risk factor for knee OA. D. K. White et al. put these two factors together in order to examine the association of obesity with walking independent of knee pain in a large sample of participants with or at risk for knee OA. Their findings are very interesting suggesting that obesity has an important association with low levels of walking in people with or at high risk of knee OA independent of knee pain.

With regards to topic (b) of this special issue, N. Parekh and colleagues using data from over 15,000 people in the Third National Health and Examination Survey (1986–2006, USA) studied the longitudinal association between leisure-time physical activity and overall cancer mortality. The authors conclude that regular vigorous activity (>6 METS) may reduce the risk of cancer mortality in persons with normal glucose metabolism. Although the authors are not able to elaborate on the mechanism based on this data, the take-home message is that vigorous physical activity may protect from cancer mortality. N. Mirza and colleagues demonstrate that among obese Latino children living in Washington D.C., USA, those who performed 60 minutes of moderate-to-vigorous physical activity per day had lower odds of displaying insulin resistance than those who did not meet this physical activity guideline highlighting the importance of physical activity for obese children from this minority ethnic group. K. Dipla and her colleagues provide an informative review discussing the influence of

acute bouts of exercise and exercise training on blood pressure control in obese children and adults. Their review focuses in particular on the mechanisms by which exercise can influence autonomic nervous system control of blood pressure. The study by Heydari et al. examined the effect of a 12-week high-intensity, intermittent exercise intervention (3 times/week, 20 min per session) in overweight males, who were assigned to either an intervention or control group. Aerobic power was improved and total, abdominal, and visceral fat were reduced in the intervention group but not in the control group. Despite these beneficial adaptations to training no changes occurred in the levels of insulin, blood lipids, and HOMA-IR. R. E. Lee et al. examined the relationship between sitting time and "cardiometabolic" risk factors in overweight African American women. They observed a positive association between sitting time and blood glucose but an inverse association between sitting time and blood cholesterol suggesting the need for further research to clarify the potential risks of sedentary behaviour in overweight African American women and in other groups.

Although the health benefits of increased physical activity, especially of high-intensity exercise, are widely understood it is interesting to note that overweight and obese individuals often avoid participating in vigorous exercise. Participant attitude is the main focus of the studies which belong to topic (c) of this special issue. To investigate the attitudes of overweight and obese people towards exercise, C. W. Hall et al. studied a group of overweight/obese individuals (age 26–50 y) who were asked to walk at a moderate intensity of 60% of peak aerobic power (VO_2 peak), an exercise intensity considered to be cardioprotective, for 30 min. The self-selected intensity corresponded to about 54% of VO_2 peak and this was lower than the predetermined one suggesting that overweight/obese individuals might prefer this metabolic rate to exercise. Interestingly, men walked at a lower percentage of VO_2 peak than women, suggesting that exercise prescription should consider not only the physiological but also the psychological characteristics and responses of overweight and obese individuals. While much of the literature focuses on the social and environmental barriers to physical activity less is known about the individual barriers. Fox et al. and colleagues using data from a survey from a low-income minority community in the USA concluded that individual barriers correlated with lower physical activity levels.

The collective take home message of the studies presented in this issue is that structured physical activity that meets the recommendations and is intensive enough to improve aerobic fitness can improve some health risk factors including body composition and blood pressure. The use of vigorous exercise is a promising health promotion tool although it is associated with practical issues like compliance, especially in untrained and clinical populations. It seems also that regular vigorous activity has the potential to reduce the risk of cancer mortality among persons with normal insulin-glucose metabolism at least for certain populations. Perceptions and other barriers may prevent some people from adopting vigorous exercise and this should be taken into account by policy makers.

Acknowledgments

My colleagues and I had the opportunity to review some very interesting manuscripts submitted to this special issue. Of the 24 manuscripts submitted, 11 were finally accepted for publication. We would like to thank all the authors who submitted their work for consideration to this special issue of the journal.

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