

Targeting sedentary behaviour

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Addendum

Valorisation

Clinical implications

Non-communicable diseases (NCDs) are a worldwide rising problem, requiring new strategies to reduce the risk of developing these chronic diseases. According to the World Health Organization, it is estimated that each year more than 36 million people die from NCDs (63% of global deaths) ⁵⁸. Therefore, there is high priority to address these NCDs, of which the importance is now highlighted by the WHO in the Global action plan for prevention and management of NCDs ⁵⁸. They stated that one of the most important ways of reducing deaths from NCDs is to control unhealthy lifestyle choices that lead to their development. As a results, they have also developed a new global action plan to help countries scale up policy actions to promote physical activity ⁵⁹.

Within the research field, the evidence-based support with respect to the importance of an active lifestyle for optimal cardiometabolic health has grown exponentially. In addition, the inter-relation between physical activity and sedentary behaviour is increasingly being addressed within the current public health guidelines and policies ⁶⁰. Several countries and healthcare organisations have already started with providing general recommendations to replace sedentary behaviour with physical activity of any intensity. The general message 'sit less and move more', as stated in the current WHO guidelines for physical activity and sedentary behaviour, is a first step towards targeting both sedentary behaviour and physical activity. Nevertheless, no written plans with regard to both effective and cost-effective ways to decrease sedentary behaviour are proposed. Although the new guidelines encourage to reduce sedentary behaviour and increase physical activity, physicians, governmental agencies and companies should take responsibilities to implement the current guidelines into our daily life. Especially in primary care physicians should encourage people to reduce sedentary behaviour by tailoring to individuals' context and circumstances. However, findings indicate that the prevalence of sedentary behaviour counselling is low, where only 10 percent of the patients in a primary care setting receive specific recommendations to reduce their sedentary behaviour ⁶¹. Therefore, we should focus on a stepwise approach to modify physical-activity behaviour on initial changes in sedentary behaviour. Here, primary care physicians and the government have the potential to play an important role in modifying sedentary behaviour within healthy inactive populations and patients with NCDs. Instead of

the well-known recommendations to achieve at least 150–300 minutes of MVPA per week, recommendations should be more personalized in which people can adopt a cocktail of sedentary behaviour and physical activity, based on differences in frequency and intensity, that works best for them.

In addition, as dieticians give advice and help people to make correct healthy lifestyle and diet choices, lifestyle/physical coaches should be trained to advise individuals regarding their sedentary and physical activity behaviours. Based on this dissertation, CWATs in combination with motivational counselling related to sedentary behaviour may need to place greater emphasis on addressing the association between sedentary behaviour and cardiometabolic health, especially for patients with NCDs and physically inactive people. Thus, starting with a focus on sedentary behaviour may be more effective on long-term behaviour change and subsequent improvements in health outcomes.

Although we found no significant benefits to reduce sedentary time and improve cardiometabolic health in sedentary adults with a CWAT on its own, I believe that these devices, as facilitators of a behaviour change intervention, will have both individual and public health implications in future NCD self-management and progression. Here, newly developed self-monitoring technologies should be able to monitor sedentary behaviour in addition to physical activity levels to support people in setting goals to reduce sedentary behaviour. With the increasing popularity of these CWATs, a formal adoption in public health practice has to be made in such a way that CWATs support continuous health monitoring, provide knowledge, give feedback and encourage a healthy behaviour. This will reduce the number of health care visits due to personalized on-demand interventions.

Furthermore, reducing sedentary behaviour and increasing physical activity normally resulted in an increased CRF. Here, CRF is a physiological measure reflecting a combination of genetic predisposition, physical activity behaviour and functional health of various organ systems⁶². As a result, CRF will improve when sedentary behaviour is reduced and physical activity increased. Therefore, CRF could be a surrogate marker for the measurement of physical activity, sedentary behaviour and cardiometabolic health in clinical practice. In this dissertation we used a cardiopulmonary exercise test using an electronically braked cycle ergometer, which is the gold standard for measuring CRF. In this way, physicians

are able to quickly and reliably estimate CRF and related physical activity behaviours, cardiometabolic health and the risk of developing NCDs.

Socioeconomic impact

The increased prevalence rates of NCDs and related comorbidities have led to a major economic burden for the global health care systems, as well as for patients themselves. The cumulative output loss due to the four major NCDs together with mental disorders is estimated to be 47 trillion US dollars ⁵⁸. These socioeconomic costs make the prevention and management of these diseases a major challenge for the 21st century. Here, the inexpensive and easy to access strategies presented within this dissertation may contribute to a reduction in this global economic burden. Reducing sedentary behaviour and increasing physical activity is freely accessible and inexpensive for the general population. In addition, the low costs of CWATs make them an attractive tool to facilitate monitoring of sedentary behaviour and physical activity. Moreover, primary care physicians may play an important role in modifying movement behaviours of their patients, since their advice is often respected and they have the ability to motivate their patients to change unhealthy behaviours ⁶³. However, due to lack of time and reimbursement, most physicians do not provide such physical activity counselling programmes. Instead, they can develop methods to incorporate feedback using CWATs into their interventions. There is also an important role for healthcare providers, who might simply advise their patients to use CWATs by reimburse or compensate these devices. In addition, they could reward people who make the effort to increase their physical activity and reduce sedentary behaviour with the aid of personalized insurance premiums.

Modifying sedentary behaviour and physical activity will probably also affect the use of transportation and related costs and, at the same time, this will have a positive effect on the emission of greenhouse gasses with respect to the urgent matter of climate change.

Furthermore, recent data from the UK's Office for National Statistics highlight that of the 131 million working days lost to sickness, important contributing factors are back, neck and muscle pain and stress, which can, for a large part, be found within office-based occupations ⁶⁴. Therefore, approaches to avoid sedentary time at work are required as potential mediating factor, of which the strategies used in

this dissertation could perfectly be implemented. Moreover, this will also improve work productivity, quality and efficiency. All these suggestions will ultimately provide cost savings to both the health care systems and employees.

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