

Research UPDATE

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Summary

What are the health risks to the public from too much time spent sitting down or engaged in other sedentary behaviours? An increasing body of evidence is suggesting that an individual's sedentary behaviours can have a detrimental effect on health, independent of how much physical activity the person does. **This article offers some insights and answers, and presents some recent research findings.**

Key Term

MET: metabolic equivalent or metabolic equivalent of task. The amount of energy used by the body to perform a physical activity or daily task. At rest, the average person has an oxygen consumption of 1 MET (or 3.5 ml/kg-min). If a person works harder and uses more oxygen during an activity, MET values go higher; light activities are those which consume 3 METs, moderate activities (e.g., brisk walking) consume to 6 METs, while vigorous activities, such as running, more than 6 METs.

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Sitting and Sedentary Behaviours: A Public Health Problem?

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What are the health risks to the public from too much time spent sitting down or engaged in other sedentary behaviours? This article offers some insights and answers, and presents some of our recent research findings.



An increasing body of evidence is suggesting that an individual's sedentary behaviours can have a detrimental effect on health, independent of how much physical activity the person does. The evidence also suggests that high volumes of sedentary behaviours might increase the risk of obesity, cardiovascular disease, and in particular, diabetes.

About Sedentary Behaviour

Sedentary behaviour is defined as low intensity activities that consume 1.5 METs of energy, such as sitting and lying down.

The interesting "catch" about sedentary behaviours and physical activity levels is that a person can be both physically active (e.g., by meeting or exceeding recommended physical activity guidelines) and sedentary at the same time. Many people (possibly including you, the reader!) fit this description or category.

For instance, if an adult person walks briskly, runs or skates for 30 minutes or more every day, they will exceed the recommended minimum of 150 minutes/week of moderate- to vigorous-intensity physical activity. However, the same person could be a "high volume sitter" if they spend most of the rest of their waking hours sitting down or being sedentary.

In this example, the person may well obtain health benefits from meeting the physical activity recommendations, but there may be independent detrimental effects from prolonged sitting or sedentary behaviours.

Systematic Reviews

Recently, we have participated in two systematic reviews that have focused on "sitting and health" epidemiology and on "interventions to reduce sitting in the workplace."

These studies have shown that sedentary behaviour and health research is still in its infancy, evidence is still accumulating and more high quality studies with better measures of sedentary behaviours are needed before we can develop guidelines and implement policy (van Uffelen et al, 2010; Chau et al, 2010).

Sitting and Sedentary Behaviours: A Public Health Problem? ...(Continued from front)

Workplace-Related Research

Our research group at the Sydney University School of Public Health in Australia, does research on both physical activity and sedentary behaviours. With respect to sitting and sedentary behaviour, we have been interested in measurement, epidemiology and surveillance from a public health perspective. We have developed accurate tools for measuring sitting in populations; and studied the prevalence and correlates of sedentary behaviour and their associations with health outcomes.

We have recently developed and tested a surveillance measure to more accurately assess sedentary and physical activity behaviours during work.

The *Occupational Sitting and Physical Activity Questionnaire (OSPAQ)* was specifically designed for population health surveys that have limited space for questionnaire items. OSPAQ was recently published in *Medicine & Science in Sports & Exercise* (Chau, van der Ploeg, Dunn, Kurko, & Bauman, 2012).

We also recently developed and tested a questionnaire, the *Workforce Sitting Questionnaire (WSQ)*, which assesses total sitting time during work, leisure and transportation. This was published in the *British Journal of Sports Medicine* (Chau, van der Ploeg, Dunn, Kurko, & Bauman, 2011).

Time Use Surveys

Besides a focus on improving the measurement of sedentary behaviour, we do research into the population prevalence and epidemiology of sedentary behaviours. One of the more innovative ways to study changes in the population levels of sedentary behaviours is the utility of Time Use Surveys.

Time use surveys have been collected as early as the 1960s, and have their origin in sociology, but have also been shown to accurately assess physical activity and sedentary behaviours (van der Ploeg et al, 2010).

Our ongoing epidemiological work on the detrimental effects of sedentary behaviours on health has been through longitudinal population cohort studies, which include the 45 and Up study in Australia (the largest prospective cohort study in the southern hemisphere), as well as other studies internationally.

Preliminary findings in our Australian data are similar to the Canadian PALS study, which showed in longitudinal analyses, that time spent sitting was a risk factor for all cause mortality, independent of physical activity level (Katzmarzyk, Church, Craig, & Bouchard, 2009).

Looking Ahead

Sedentary behaviour research is at an early stage, and there are still a lot of unknowns. Importantly, the volume and dose of sitting that is hazardous to health is not exactly identified.

Future epidemiological work will help to quantify the amount of sitting time that is potentially harmful to health and also further our understanding of which health outcomes are related to sitting. The role of breaking up sedentary behaviour to improve metabolic health is also receiving research attention.

Eventually, when we understand how much sitting is hazardous, and what recommendation(s) would be health-promoting, we need to develop policies, guidelines and eventually interventions to decrease sedentary behaviours.

Generally, the development of interventions to reduce sitting time is "work in progress." Part of this work involves consulting with workplaces, advocating for active transport, and determining what kinds of interventions are feasible and practical, in different settings. As more research and evidence comes to light, it can contribute to a healthier and "upstanding" future.

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