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Associations between sitting time and a range of symptoms in mid-age women

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ABSTRACT

Objective. The aim of this study was to explore longitudinal associations between sitting and physical and psychological symptoms in mid-age women.

Method. Mid-age (53–58 years) participants in the Australian Longitudinal Study on Women's Health completed mail surveys in 2004 (n = 10,286), 2007 (n = 10,128) and 2010 (n = 9452) with questions about sitting time (<6, 6–9, and ≥9 h/day) and frequency of 19 symptoms in the preceding 12 months (often vs. never/rarely/sometimes). Associations between sitting and symptoms were examined using two logistic generalized estimating equations models: (a) sequential cross-sectional data from 3 surveys, and (b) prospective model with a 3-year time lag (significance level = 0.01).

Results. Approximately 53%, 30% and 17% of the women were classified as sitting <6, 6–9 and ≥9 h/day in 2004. In adjusted cross-sectional models, women sitting ≥9 h/day had significantly higher odds of breathing difficulties (OR = 1.52, 99% CI = 1.17–2.00), tiredness (OR = 1.21, CI = 1.05–1.40), bowel problems (OR = 1.26, CI = 1.02–1.56), eyesight problems (OR = 1.16, CI = 1.01–1.34), and depression (OR = 1.39, CI = 1.15–1.68) than women sitting <6 h/day. Adjusted prospective models showed higher odds of breathing difficulties (OR = 1.94, CI = 1.40–2.69), chest pain (OR = 2.04, CI = 1.14–3.70), and tiredness (OR = 1.24, CI = 1.04–1.48). Associations with breathing difficulties and chest pain remained significant after excluding participants with chronic conditions in 2004.

Conclusion. Prolonged sitting may a determinant of breathing difficulties and chest pain three years later in mid-age women.

Introduction

Sedentary behaviour is defined as activities done sitting or lying down that do not increase energy expenditure substantially above the resting level, such as watching television and reading a book (Pate et al., 2008). A growing body of evidence suggests that sedentary behaviour increases the risk of obesity, cardiovascular diseases, diabetes and premature death (Gomez-Cabello et al., 2012; Thorp et al., 2011), and that this increased risk may occur even when physical activity is taken into account (Brown et al., 2009; Tremblay et al., 2010). Sedentary behaviour is measured either objectively (accelerometers) or subjectively (questionnaires) and although neither measure fully captures the definition given above, associations have been found with both (e.g. Koster et al., 2012; Matthews et al., 2012). To date, sedentary behaviour epidemiology has mainly focused on outcomes related to cardiovascular and metabolic health. Measures of sedentary behaviour have however, also been related to gallbladder disease (Leitzmann et al., 1998, 1999), cancer (Friberg et al., 2006; Gierach et al., 2009; Patel et al., 2006, 2008), and mental disorders (Sanchez-Villegas et al., 2008). These relationships with conditions that involve various body systems, suggest a wide-ranging impact of sedentary behaviour on health.

Symptoms, such as pain, fatigue, respiratory problems, vasomotor symptoms, and mood disturbances can be associated with high levels of distress and disability (Patterson et al., 2012; van der Windt et al., 2008), and as such are often the main reason for visiting a physician. They can be important indicators of health problems, even before a definitive diagnosis is made. Exploring relationships between sedentary behaviour and symptoms may provide insight in the variety of body systems affected by sedentary behaviour. Mid-age women are a priority target group for such research, as transmenopausal changes can initiate an increase in incidence of chronic disease (Atsma et al., 2006; Meema and Meema, 1976).

The aim of this paper was to explore longitudinal relationships between time spent sitting and a range of physical and psychological symptoms over a period of six years in mid-age Australian women. The analyses included a broad range of symptoms to cover the full range of body systems.

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Methods

Study sample

Data were from the mid-age cohort (born 1946–1951) of the Australian Longitudinal Study on Women's Health (ALSWH); a prospective study of the health and well-being of three generations of women (Lee et al., 2005). As reported elsewhere, samples were randomly drawn from the national Medicare health insurance database, which includes all Australian citizens and permanent residents, with intentional over-representation of women from rural and remote areas. More details about the study can be found at www.alswh.org.au. The study was approved by the University of Newcastle Ethics Committee, and informed consent was received from all participants (Brown et al., 1998; Lee et al., 2005). Baseline surveys were mailed in 1996, with the first follow-up in 1998, then at three yearly intervals to 2010. Comparison of the baseline sample (n = 13,715, response rate 54%) with Australian census data indicated that the sample was representative of Australian women in this age group, but with a somewhat higher representation of partnered women and of women with post-school education (Brown et al., 1998). As questions about sitting time were first included in survey 4, we used data from surveys 4, 5 and 6 (2004, 2007, and 2010, response

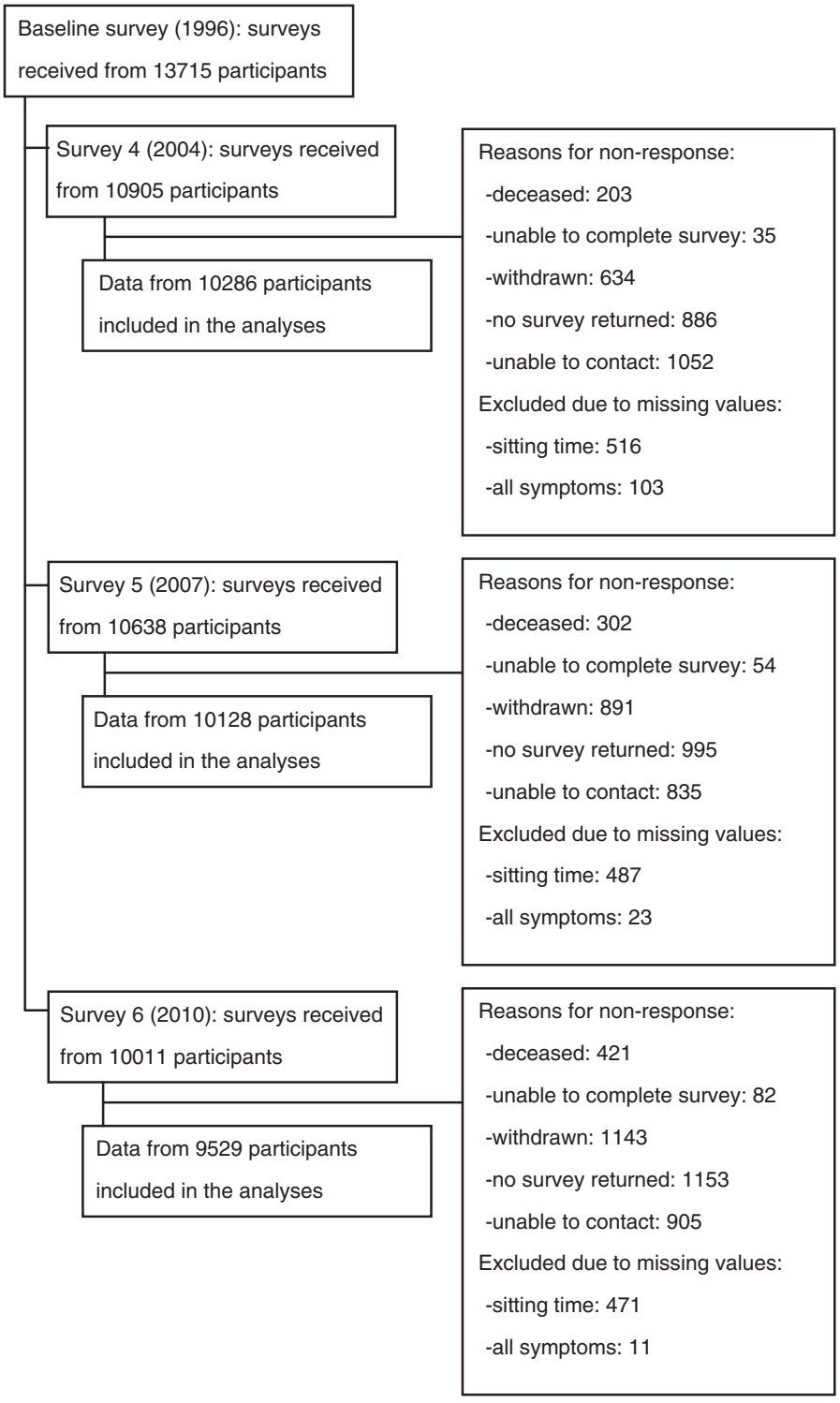

Fig. 1. Flow chart of participants in the Australian Longitudinal Study on Women's Health (2004–2010).