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Activities of Daily Living and Health

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Since the 1990s the focus of public health recommendations for increased cardiorespiratory fitness and health had shifted from vigorous exercise to moderate intensity physical activity (Murphy et al., 2010; Lee and Buchner, 2008). Current scientific consensus and public health guidelines emphasize the significance of overall energy expended, regardless of the type, intensity of physical activities, and their duration, provided they are cumulated in bouts of minimum 10 minutes. To gain significant health benefits, adults and older adults should perform a total of 150 minutes of moderate intensity or 75 minutes of intensive aerobic activity per week (WHO, 2010). Though as of now not integrated in guidelines, activity bouts shorter than 10 minutes may also have beneficial effects on cardiometabolic markers (Barr-Anderson et al., 2011; Boreham et al., 2005; Meyer et al., 2010). Activities of daily living, such as household, gardening, stair climbing, walking and cycling are typically non-vigorous, non-exercise activities, often of shorter duration. These activities are now acknowledged as a major health resource, and are explicitly advocated by many health authorities. The present paper gives a succinct overview of health effects of activities of daily living, including their potentials and limitations.

In line with its availability and measurability, of all activities of daily living, walking, ''the nearest activity to perfect exercise'' (Morris and Hardman, 1997), has received by far the most scientific interest both in prevention and therapy of chronic diseases. We are born to walk; walking is our most ancient and natural way of getting around and being physically active (Morris and Hardman, 1997). Walking is a low-threshold, low risk and highly accessible aerobic activity, involving over half of the body's total muscle mass (Morris and Hardman, 1997). Energy expended increases with pace; energy expenditure of walking at 5 km/h is approximately threefold that of resting (Morris and Hardman, 1997).

Current physical activity recommendations ''translate'' into some 3.000-4.000 steps/day on top of ''baseline activity'', resulting in a total of 10.000 steps/day (Tudor-Locke et al., 2010). As to walking, Germany ranks in the middle among European countries, and way beyond Canada, Australia, and the US (Bassett et al., 2008). Germans walk an average of 18,49 minutes/day, and walking comprises 23,7% of all trips (Buehler et al., 2011).

A single bout of slow or brisk walking has been shown to improve cardiometabolic markers, such as postprandial lipid levels (Miyashita et al., 2013), plasma triacyglycerol concentrations, resting blood pressure (Miyashita et al., 2008), and post-meal blood glucose response (Nygaard et al., 2009) in healthy and in metabolically compromised subjects (Lunde et al., 2012). In diabetic patients a single session of brisk walking improved affect and psychological wellbeing (Kopp et al., 2012).

Most data on chronic effects of walking derive from epidemiologic studies. Walking is a powerful weapon in prevention: it provides incremental protection against cardiovascular (Boone-Heinonen et al., 2009; Murtagh et al., 2010) and coronary heart disease (Zheng et al., 2009). In The Nurses' Health Study, energy expenditures being equal, walking and vigorous activity resulted in commensurate magnitudes of diabetes risk reduction (Hu et al., 1999). A large case-control study found significant inverse associations between colon cancer risk and levels of commuting (walking and cycling) (Hou et al., 2004), and a current meta-analysis reported a 3% risk reduction for breast cancer for every 10 metabolic equivalent hours per week (10 MET-h/week) increment in recreational activity, including walking (Wu et al., 2013). Possible mechanisms behind these protective effects might be lower blood pressure (Lee et al., 2010), improved blood lipid profiles (Kelley et al., 2004) and decreased Body Mass Index (BMI) (Bravata et al., 2007).

The rewards of walking go beyond bodily ones; ''walkers'' benefit from better cognitive function and less cognitive decline: the respective cognitive scores of women who walked ca. 150 min/week vs. 40 min/week showed a difference corresponding to 1.5 years (Weuve et al., 2004). Increased walking has been shown to be protective against depressive symptoms in elderly men (Smith et al., 2010). Also, in the Australian Longitudinal Study on Women's Health walking was associated with both current and future mental health in elderly women (Heesch et al., 2011).

Walking can play an important role also in secondary prevention; patients with diabetes who walk regularly have reduced cardiovascular mortality risk (Sluik et al., 2012), and patients with

cardiovascular diseases who engage in regular walking enjoy lower cardiovascular and all-cause mortality risks than their inactive counterparts (Hamer and Stamatakis, 2009). Prostate cancer patients who walk 90 or more minutes per week at a normal to very brisk pace had a 46% reduced risk of all-cause mortality compared to those who walk less or at a lower pace (Kenfield et al., 2011).

Intervention studies show that increasing the number of steps taken by the recommended 3.000 steps extra or 30 minutes per day may lower body weight and body mass index, enhance aerobic fitness and subjective quality of life, and improve blood lipid profile in previously inactive but healthy people (Wallmann and Froboese, 2011; Pagels et al., 2012). Cancer survivors also benefit from walking through lower levels of fatigue and improved quality of life (Yeo et al., 2012), as well as treatment-related symptoms and mood (Yang et al., 2011).

Commuting cycling at approximately 15 km/h (Møller et al., 2011; Hartog et al., 2010) has a metabolic equivalent (MET) value of 4-6.8 and is of moderate-high intensity (Ainsworth et al., 2011). Germans cycle an average of 6.41 minutes/day and do 10% of all trips by bicycle (Buehler et al., 2011). In prospective observational studies commuter cycling was found to be strongly and inversely associated with all-cause and cancer mortality, and cancer morbidity (Oja et al., 2011). Increasing commuter cycling has been shown to improve coronary heart disease risk factors and health-related quality of life (Geus et al., 2008), cardiorespiratory fitness and body composition (Møller et al., 2011) in untrained adults.

Data on activities of daily living excluding walking and cycling are limited compared to active commuting (Stamatakis et al., 2009; Matthews et al., 2007). In a current meta-analysis housework, gardening, stair climbing and active travel were associated with a relative risk reduction of all-cause mortality comparable with that produced by exercise (Samitz et al., 2011). High volume of household activities seems to be protective of breast cancer (Steindorf et al., 2013) and of psychological distress (Hamer et al., 2009). The meta-analysis of Woodcock and colleagues confirms that any activity is better than none: they found a non-linear relationship between light and moderate physical activity, including active commuting and household chores and all-cause mortality, with the greatest risk reduction occurring between complete inactivity and low level of activity (Woodcock et al., 2011). Stair climbing is a high intensity activity, which is easy to integrate into daily life. The accumulation of 10-11 minutes of stair climbing per day may improve cardio-metabolic parameters and increase cardiorespiratory fitness (Boreham et al., 2005; Meyer et al., 2010). Also, integration of bouts of physical activity as short as 3-20 minutes into organizational routine in schools and work places may represent a promising avenue to increase overall physical activity and ultimately promote health (Barr-Anderson et al., 2011).

The public health relevance of activities of daily living lies in the fact that they are readily available for large parts of the population, require no special skills or equipment, and are low injury-risk. These activities, however, are often of light-moderate intensity and may not represent the overload necessary to evoke physiological adaptations, which could translate into health benefits in fit individuals (Zheng et al., 2009). In physically unfit and elderly populations, on the other hand, even these intensities seem to stimulate health-enhancing responses (Zheng et al., 2009). Since the highest public health benefits would occur when the least fit individuals became at least moderately fit, activities of daily living have high potential (Mandic et al., 2009).

In conclusion, activities of daily living yield health benefits without noteworthy risks in untrained and elderly populations. The combined effects of these benefits at the public health level make the promotion of these activities a promising and necessary way to improve health in populations disinclined to exercise.

Die korrespondierende Autorin erklärt, dass kein Interessenkonflikt vorliegt.

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