The impact of walking on health: a literature review

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Abstract

A literature review was carried out on the effects of walking and physical activity on physical and mental health. Reviews of the most salient articles were carried out for obesity, diabetes, asthma COPD, cancer, CVD, musculoskeletal and mental health problems. Many positive effects are reported for primary and secondary prevention of disease, plus additional psychosocial benefits. There are clear implications for health service cost savings by investing in health walking schemes.

Key words: walking, exercise, primary prevention, secondary prevention, health economics, intervention

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Introduction and context

There is a great deal of evidence that supports the health benefits of physical activity for the general population. Participating in at least 30 minutes of moderate intensity physical activity (such as brisk walking) has been shown to reduce morbidity and mortality due to chronic disease and disability (Hakim et al, 1998). Walking is the most accessible form of physical activity and is recommended for health benefits because it is an activity most people can do and is associated with a low injury rate (Tsuji et al, 1998). A 10-year follow-up of the participants in a randomised clinical trial of walking in the US showed that the participants in the walking group continued to walk longer and had lower hospitalization rates than the control group, indicating long term benefits (Pereira et al, 1998).

An inactive lifestyle is associated with a greater risk for a range of chronic diseases, (e.g. coronary heart disease in men, Hakim et al, 1999; coronary heart disease in women, Manson et al, 1999; diabetes, Sigal et al, 1999; stroke, Hu et al, 2000; mood, Hansen, Stevens & Coast, 2001; cancer, Bianchini, Kaaks & Vainio, 2002; chronic obstructive pulmonary disease, Chavannes et al, 2002; hypertension, Hayashi et al, 1999). It is thus likely that sedentary lifestyles translate into an increase in medical care costs. Existing literature suggests that an increase in time spent walking is significantly associated with lower medical costs (Tsuji et al, 2003).
Why walking?

The Department of Health has advocated that individuals engage in moderate exercise, including walking, for a minimum of 30-minutes on five or more days a week (DH, 2004). Walking has been considered to be the preferred choice of exercise among the European population (Dunn et al., 1998; Vaz De Almeida et al., 1999); probably because it is an accessible form of exercise that requires little expenditure, increases their individual choice in pace-setting and has fewer risks than other forms of exercise.

Why group walking?

Walking with others in a group can have many social advantages, plus the additional benefit of encouraging motivation among individuals when they commit to a walking routine. The benefits of group exercise, including walking, have been documented within many conditions and groups of individuals (for example, women with breast cancer, Mutrie et al, 2007; older adults, Barnett et al., 2003). There has been a positive national evaluation of group walking schemes in the Walking the Way to Health Initiative (Dawson et al, 2006).

Obesity

Obesity is becoming an increasing concern for health services, as cases of overweight and obesity escalate. In 2002, 22% of people were estimated to be obese (National Obesity Forum, 2009). Obesity can lead to further health problems. It has been well known for many years that exercise is an effective preventative and therapeutic intervention for obesity (e.g. Bouchard, DeprŽs and Tremblay, 1993). Obesity increases mortality rates from all causes by 50 to 100% (Poirier and DeprŽs, 2001). Systematic reviews of obesity interventions suggest that the addition of exercise to diet is associated with improved weight loss and risk factors (i.e. for death, cardiovascular disease death, cancer and diabetes-related death; Avenall et al, 2004). Indeed, Poirier and DeprŽs (2001) note that, Ôpublic health interventions promoting walking are likely to be the most successfulÓ for the weight management (and thus related morbidity and mortality) of obesity. Of interest, this study found that even if weight loss is minimal, obese individuals showing a good level of cardio-respiratory fitness are at reduced risk for cardiovascular mortality than lean but poorly fit people.

Diabetes

In the UK, 2.3 million people are diagnosed with diabetes, with an estimated further half million not aware that they have the disease (NHS Choices, 2009e). Exercise is considered to be one of the cornerstones of diabetes therapy (BoulŽ et al, 2001). Regular physical activity, such as walking, is recommended for patients with diabetes since it has beneficial effects on metabolic risk factors for the development of diabetic complications (American Diabetes Association, 1997), such as damage to the
kidneys, eyes, nerves, heart, and blood vessels (Yki-Yarvinen, 1998). Meta-analytic studies have confirmed that exercise does indeed have a significant positive effect on reducing the risk of diabetic complications, even without weight loss (Boulé et al, 2001).

**Asthma**

Over 5 million adults are affected by asthma in the UK, with 1218 people dying annually from the disease (NHS Choices, 2009a). Although the effects of exercise on asthma are somewhat difficult to clarify due to individual beliefs about the illness, it is clear from existing literature that exercise improves coping behaviours, beliefs about physical competence and self esteem in addition to overall physical fitness (van Veldhoven et al, 2001).

A number of studies (Clark & Cochrane, 1988; Garfinkel et al, 1992) have found that patients with asthma have lower cardiorespiratory fitness than their peers. The fear of inducing an episode of breathlessness may inhibit people with asthma from taking part in physical activity; a low level of regular physical activity in turn leads to a low level of physical fitness. A systematic review of the literature (Ram, Robinson & Black, 2000) found that aerobic power does improve after physical exercise in individuals with asthma. Thus, it can be extrapolated that a well supported, low intensity exercise programme would be highly beneficial to men this association was strongest for colorectal and lung cancer, for women; breast and cervical cancer.

More recently, Warburton, Nicol & Bredin (2006) performed a thoroughly comprehensive systematic review of the effects of activity levels on a range of illnesses. For cancer, they concluded from meta-analyses and a large number of epidemiological studies that increased levels of activity reduced the risk of cancer (particularly colon and breast cancer). They also concluded from a range of evidence, that there was some suggestion of increased survivability of cancer patients that exercised more, although evidence is not currently very strong.

An economic evaluation of the health burden of physical inactivity in Canada (Katzmarzyk, Gledhill & Shephard, 2000) calculated the relative risk of developing breast cancer as 1.22 times as likely, and the relative risk of developing colon cancer as 1.39 times as likely in people with sedentary versus active lifestyles. This study calculated that 2.5% of Canadian healthcare expenditure was directly related to physical inactivity, matching findings in the US (2.4%).

Stephenson, Lawlor & Fox (2004) evaluated 33 controlled trials of physical activity interventions for
cancer patients, and concluded there were moderate increases in physical function, with no statistically significant increase in fatigue. Aside from direct physical health benefits, Courneye & Friedenrich (1999) identified in a systematic review that exercise intervention also improves functional wellbeing and quality of life in cancer patients.

**Cardiovascular disease (CVD)**

Coronary heart disease (CHD) and stroke are two of the most common cardiovascular diseases affecting the heart and circulatory system and the most common cause of death in the UK; currently contributing to 300,000 and 111,000 deaths per year respectively (NHS Choices, 2009d, 2009g).

In addition to the more traditionally recognised risk factors of CVD (age, gender, smoking, diet/obesity, diabetes and hypertension) newer risk factors have been recently acknowledged to include sedentary lifestyles and physical inactivity (Kumar & Clark, 2005). A recent meta-analysis provided strong evidence that individuals who led healthy, yet sedentary lifestyles improved several known risk factors for CVD following the uptake of regular brisk walking (Murphy et al., 2007).

The inverse relationship between walking and clinical disease was further established by Hamer and Chida (2008). It appears that walking is sufficient for increasing overall cardiovascular fitness, reducing BMI and body weight and contributes to a decrease in resting diastolic blood pressure (Murphy et al., 2007). While an increased amount of walking has been demonstrated to reduce risk factors associated with CVD, research has identified that walking just one-hour per week or possibly less, could benefit inactive women at risk of CVD (Oguma & Shinoda-Tagawa, 2004). Additionally, research has highlighted that walking pace may interact with the effect walking has on reducing mortality risk among individuals with diabetes at risk of CVD (Tanascu et al., 2003). In a cost-benefit analysis design investigating the cost savings of walking for CHD, it was concluded that the savings in health-related costs of CHD are mediated by how much individuals enjoy time spent engaged in walking activities (Jones & Eaton, 1994).

Lowensteyn et al (2000) highlight the long-term benefits and cost-effectiveness for both primary and secondary prevention for CVD from supervised and unsupervised exercise groups. Most of the research investigating the benefits of walking on CVD tends to look at reducing the risk factors (primary prevention) for developing both CHD and stroke, with encouraging findings in many studies (Bassuk & Manson, 2003; Goya & Gerald, 2001; LaCroix et al., 1996; Lee et al., 2003; Manson et al., 2002).

There have been more specific investigations into the benefits of walking after a CVD event, including stroke (secondary prevention). Ada et al (2003) demonstrate the efficacy of community-based walking programmes following a stroke for individuals living in the community. Both outdoor and treadmill walking for 30-minutes, three times a week improved individuals' walking speed, capacity and the effects of their disability from stroke (Ada et al., 2003). Eng et al (2003) further highlight the benefits of a community-walking programme among stroke patients; improved balance and falls prevention. This is a key area of rehabilitation for stroke and other CVDs.

**Musculo-skeletal**

Osteoporosis is a common skeletal disease in post-menopausal women and older adults. There is an increased risk of fracture and fragile bones due to decreases in bone mineral density (Kumar & Clark, 2005). It is estimated to cost approximately £1.75 billion annually in the UK (Kumar & Clark, 2005). It has been suggested that an increasingly sedentary lifestyle has contributed to the decline in bone mineral density and has consequently led to an increase in osteoporotic fractures (Ebrahim et al, 1997). An individual's physical fitness has been indicated to increase bone mineral density, therefore potentially reducing the risk of osteoporosis (Pocock et al, 1986; Puntila et al, 2001). Walking as a health intervention, it has been suggested, can be easily included in an individual's daily lifestyle, and research indicates good adherence to walking programmes (Brooke-Wavell et al, 2001). While walking has received much support in the literature to reduce risk factors for osteoporosis, PalomboRoOs (2007) meta-analysis suggested that walking in addition to other forms of exercise could have better outcomes for individuals.

Osteoarthritis is a musculoskeletal condition, in which individuals suffer from joint pain to varying
degrees (Kumar & Clark, 2005). A systematic review (Smidt et al, 2005) concluded that exercise involving strengthening, stretching and functional exercise such as walking, are effective for individuals with osteoarthritis in the hip and knee.

Walking has therefore been suggested to have a positive impact on various musculoskeletal conditions. Furthermore, Chan et al (2003) refer to the benefits of walking beyond bone health, to include muscle strength, coordination and balance.

Mental health

One in four people will experience a mental health problem at some stage in their life (NHS Choices, 2009f). The term Ômental health problemÕ covers a range of disorders including anxiety, depression and schizophrenia amongst others. Mental health affects daily functioning, relationships and physical wellbeing.

Penedo & Dahn (2005) evaluated randomised controlled trials of exercise interventions along with longitudinal and cross-sectional studies, for a range of health outcomes. They concluded that exercise had positive effects on health, wellbeing and mood states for a wide variety of health problems, including mental health. Similarly, Callaghan (2004) reviewed the literature and found a range of benefits of exercise upon mental health, including; reduced anxiety and depression, improvements in mood, self esteem and cognitive functioning, and quality of life improvements for those with schizophrenia. The review also reported that mainstream health services often do not make use of this valuable resource. Qualitative research by Carless & Douglas (2008) highlights themes of social inclusion and support as secondary benefits of exercise programmes for men with mental health difficulties.

Fox (1999) performed a systematic review of meta-analyses on the effects of exercise on mental health. The conclusion was that there was sufficient evidence for the use of exercise to treat clinical depression, in addition to reducing anxiety, improving self-perception and self-esteem. They also concluded the risk of exercise addiction was minimal. Lawlor & HopkerÕs (2001) meta-analysis highlighted that exercise interventions may be good for short term symptom management, but warn that most studies were carried out with ÔhealthyÕ volunteers with minimal follow-up.

De Moor et al (2008) conclude from a twin study involving almost 6000 people that although there is an association between increased exercise and reduced anxiety and depression, this is a correlational relationship and does not imply causality. Their study shows the reduction is not caused by exercise, although this is a ÔnormalÕ non-clinical population sample without mental health problems. Raglin (1990) highlights that the positive effects of exercise upon mood are more pronounced for those already experiencing psychological distress. These findings therefore suggest that targeting interventions at those currently experiencing mental health problems will be beneficial.

The Department of Health report ÔChoosing Activity: a physical activity action planÕ (2005) stated that increasing activity levels contributes to the prevention and management of a wide range of illnesses, including mental health problems. In particular it highlighted Ôpositive benefits for mental health including reduced anxiety, and enhanced mood and self-esteemÕ (p6).

The Mental Health foundation report ÔMoving on UpÕ (2009) reviewed the use of exercise intervention programmes for mental health. They highlighted that these programmes are beneficial because they are:

- Cost effective
- Available
- Have co-incidental benefits (physical health, weight loss, social support)
- Are a sustainable recovery choice (do not require continuing professional input)
- Promote social inclusion and are a normalising experience
- Popular

In the same review, the Mental Health Foundation surveyed 200 GPs on their practice regarding mild to moderate mental health problems. Among the findings; over 80% of GPÖs that had access to exercise referral schemes said they referred people with mild to moderate depression to the scheme. 95% of GPÖs who did not have access to an exercise referral scheme said they would refer
patients with mild to moderate depression if they had the option.

The review also evaluated several exercise referral schemes currently in use in the UK. Statistically significant improvements were found in the following:

- Decision making confidence
- Recognising early signs of being unwell
- Awareness of what it takes to keep well and happy
- Knowing where to get help
- Feeling that their physical health was good
- Feeling they had energy and enthusiasm for current activities
- Feeling encouraged to try new things

The report also emphasised that “for some people with mental health problems, less structured and more open-ended activities such as healthy walking schemes, may be more appropriate.” (p16) The report recommended that commissioners and services support exercise referral schemes for a range of health benefits, and not to solely consider physical health in such schemes.

Conclusions

It is clear from reviewing the literature that moderate exercise such as walking has clear benefits for a range of physical and mental health problems, with additional social and motivational benefits arising from structured or led group activity. The primary and secondary preventative benefits of walking on health have the potential for very large economic impact on health expenditure. Led-walk schemes should be considered as a relatively inexpensive intervention with far-reaching impact on health outcomes and expenditure.

References


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Mental Health foundation (2009) Moving on up


