



Review

Can physical activity prevent physical and cognitive decline in postmenopausal women? A systematic review of the literature

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ABSTRACT

Background: Participation in regular physical activity is among the most promising and cost effective strategies to reduce physical and cognitive decline and premature death. However, confusion remains about the amount, frequency, and duration of physical activity that is likely to provide maximum benefit as well as the way in which interventions should be delivered.

Aims: This paper aimed to review research on the impact of leisure-time and general physical activity levels on physical and cognitive decline in postmenopausal women. In a systematic review of the literature, empirical literature from 2009 to 2013 is reviewed to explore the potential impact of either commencing or sustaining physical activity on older women's health.

Results: All studies found that physical activity was associated with lower rates of cognitive and physical decline and a significant reduction in all-cause mortality. In this review we found that exercise interventions (or lifestyle activities) that improved cardiorespiratory exercise capacity showed the most positive impact on physical health.

Conclusions: Findings suggest that programs should facilitate and support women to participate in regular exercise by embedding physical activity programs in public health initiatives, by developing home-based exercise programs that require few resources and by creating interventions that can incorporate physical activity within a healthy lifestyle. The review also suggests that clinicians should consider prescribing exercise in a tailored manner for older women to ensure that it is of a high enough intensity to obtain the positive sustained effects of exercise.

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1. Background

In recent times, many parts of the world have seen changes to their population structure, with fewer children and more older people comprising the total population [1], and contemporaneous changes in patterns of illness and disability. More specifically, it has been estimated that most adults aged 65 years and older have at least one chronic health condition [2,3], and the prevalence of many of these conditions is expected to continue to rise [4]. Clearly, aging populations pose significant challenges to individuals, families and societies, [5] not only because of the increased burden of disease and disability but also the associated healthcare and social welfare costs [6,7].

As a result of these changes, reducing risk and promoting healthy ageing have become important strategies for reducing morbidity, mortality and other indirect costs to society. Undoubtedly, the absence of chronic conditions is associated with good physical health and cognitive functioning [2,3,8], though it is likely that a variety of factors also play a role. Indeed, healthy aging has been associated with a range of healthy lifestyle behaviours including participation in regular physical activity [4,9–12], healthy diet, moderate alcohol consumption, and abstinence from cigarette smoking [13,14]. Research also suggests that adopting these behaviours might slow physical or cognitive decline among those who have some existing illness or impairment [10,15,16].

Though adopting a variety of healthy lifestyle behaviours is likely to have a positive impact on health, physical inactivity has been increasingly recognized as an underlying cause of mortality and morbidity [17–19]. A number of studies have demonstrated positive outcomes associated with sustained regular physical exercise [20–28] though the activities, their amount, duration, and frequency have varied across studies. According to a study by Dalleck and colleagues, a dose–response relationship was found between exercise duration and biochemistry, physical fitness and anthropometric measures in postmenopausal women [21].

Older adults who undertake regular physical activity also report significantly less disability [13,29,30], and better physical function [24], regardless of body mass [31]. Research also suggests that exercise may improve the mental well-being of frail elders [27] and this is likely to yield significant cost-effectiveness ratios (per quality adjusted life year gained) when compared with minimal intervention [27]. Possibly, participation in regular physical activity is among the most promising and cost effective strategies to reduce physical and cognitive decline and premature death [4,10]. However, confusion remains about the amount, frequency, and duration of physical activity that is likely to provide maximum benefit as well as the way in which interventions should be delivered. Indeed, a recent Cochrane review concluded that there was insufficient data to conclusively determine whether regular cardiovascular activity was a leading factor in preventing cognitive decline [32]. Another

limitation in current literature is the dearth of data exploring the long-term effects of changes in physical activity particularly among older populations who become physically active relatively late in life [33].

Empirical literature exploring the impact of physical activity specifically on women's health is also limited. Indeed, a recent review published in *Post Reproductive Health* on behalf of the British Menopause Society (BMS) suggested that women should be able to optimize their health and well-being through menopausal transition and into the older years, highlighting the importance of access to information on lifestyle factors, diet, and complementary and alternative therapies [34]. The paper elucidates to the importance of lifestyle interventions in improving women's health through midlife and beyond, however without specific reference to the importance of physical activity on preventing cognitive and functional decline.

This paper attempts to address some of these issues by drawing together empirical literature from 2009 to 2013 on the potential impact of either commencing or sustaining physical activity on older women's health. More specifically, this paper reviews recent research on the impact of leisure–time and general physical activity levels on physical and cognitive decline. It is hoped that this paper will provide clearer activity recommendations for older women to prevent cognitive and functional decline.

2. Methods

The aim of this paper is to review the recent empirical literature (2009–2014) on the impact of exercise on functional and cognitive decline in older women.

2.1. Search strategy

A standardized protocol was developed and followed for all steps of the review; see Fig. 1. Searches were conducted across MEDLINE, CINAHL, and PsycINFO databases using the All Text (TX) method for search terms: 'older women' OR 'elderly' OR 'geriatric' OR 'female' AND 'exercise' OR 'physical activity' OR 'leisure time activity' OR 'active' AND 'no exercise' OR 'sedentary lifestyle' OR 'inactive' AND 'physical decline' OR 'mental decline' OR 'poor mental health' OR 'poor physical health' OR 'functional abilities' OR 'functional ability' OR 'health status'. The searches were limited to peer-reviewed, published, human studies in English language within the date range of 2009–2014. All databases were accessed in March 2014.

In addition to searching academic databases, searches of unpublished and grey literature were also performed; Mednar, Open Grey, and trial registers (U.S. National Institutes of Health register, the EU Clinical Trials Register website, and the Australian New Zealand

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