



Exercise improves depressive symptoms in older adults: An umbrella review of systematic reviews and meta-analyses



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ABSTRACT

Late-life depression is a growing public health concern. Exercise may be of added value but the literature remains equivocal. We conducted a systematic overview of meta-analyses and an exploratory pooled analysis of previous meta-analyses to determine the effect of exercise on depression in older adults. Two independent researchers searched Pubmed, CINAHL, Cochrane Plus, PsycArticles, and PsycInfo for meta-analyses on exercise in late-life depression. Methodological quality was assessed using the Assessment of Multiple Systematic Reviews (AMSTAR) Instrument. We pooled effect sizes from previous meta-analyses of randomized controlled trials to determine the effect of exercise on depression in older adults. The systematic review yielded 3 meta-analyses. In total, 16 unique cohorts of 1487 participants were included. The quality of the three included meta-analyses was considered as “moderate” according to AMSTAR scores. No serious adverse events were reported. Compared to controls (n=583), those exercising (n=541) significantly reduced depressive symptoms. Our umbrella review indicates that exercise is safe and efficacious in reducing depressive symptoms in older people. Since exercise has many other known health benefits, it should be considered as a core intervention in the multidisciplinary treatment of older adults experiencing depression.

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1. Introduction

Depression is a major public health problem throughout the world affecting more than 350 million people worldwide (World Health Organisation, 2012). It is the most common mental illness among older adults (Alexopoulos, 2005; Strawbridge et al., 2002). Depression is a debilitating condition associated with increased somatic morbidity (Vancampfort et al., 2013), premature mortality (Sutcliffe et al., 2007), lower levels of well-being, poorer physical, social, and cognitive functioning, greater risk of suicide (Conwell et al., 2000), and increased use of health care facilities (Katon et al., 2003). Moreover, in the older population, loneliness and social isolation are potential risk factors for depression (Adams et al., 2004). The prevalence of depressive disorders apparently decreases with age (Scott et al., 2008), with prevalence of major depressive disorder in community samples of adults aged 65 and older ranging from 1 to 10%. Clinically significant depressive symptoms are present in approximately 15% of community-dwelling older adults (Fiske et al., 2009). Compared to younger populations, the prevalence of depression is higher in those with type 2 diabetes (Freitas et al., 2016), chronic pain (de Waal et al., 2016), and those with specific clinical conditions (Hasin et al., 2005; Park et al., 2012; Blazer, 2003). The onset and maintenance of depressive disorder in late life is due to a range of factors including genetic vulnerability, age-associated neurobiological and cognitive changes, and a variety of stressful life events that occur more frequently in late life such as bereavement, reduction in financial incomes, providing care for an ill relative and occurrence of illness reducing autonomy in daily life (Carta et al., 2008; Fiske et al., 2009).

Unfortunately, treatment of depression is inappropriate for most older adults (Karlsson et al., in press) with a limited number of evidence-based treatments. The current treatments for depression in older age include antidepressants, electroconvulsive therapy, cognitive behaviour therapy, and exercise (Frazer et al., 2005). Although medication for depression might be effective for some, they may also have undesirable cardio-metabolic side-effects (Vancampfort et al., 2013), high costs (Meekums et al., 2015) and can be associated with risk of falls (Richards et al., 2007; Stubbs et al., 2015). The value of exercise to improve health (Warburton et al., 2006) particularly among those with depression have been explored in the general population (Knapien et al., 2009).

Considerable progress has been made in understanding the effect of exercise in late-life depression and numerous systematic reviews and meta-analyses have been published (Forsman, et al., 2011; Patel et al., 2012). Conclusions based on systematic reviews of randomized controlled trials (RCTs) are considered the top of the hierarchy of evidence (Moe et al., 2007). Despite the fact that meta-analyses are the cornerstone of evidence based medicine

and considered the “gold standard”, there is an increasing realisation that even a perfect meta-analysis with perfect data can only provide a partial overview of an intervention available to clinicians (Stubbs et al., 2015). When one considers the complex nature of depression in older adults and the multitude of ways to deliver aerobic exercise and resistance training interventions available, this notion becomes evidently clear. In addition, there is a rising challenge for busy clinicians to keep on top of the evidence base of any given topic and it is not feasible for clinicians to read multiple individual systematic reviews. Moreover, differences in scope, methods of analysis, results, and quality of systematic reviews can cause great confusion and make it difficult for policy makers to access the review-level evidence, and for researchers to know where gaps in the evidence exist. They serve as a useful starting point for decision makers to unpack the evidence towards finding solutions to improve practice and identify areas where new research is needed. Therefore the popularity of umbrella reviews, or systematic reviews of systematic reviews has increased. With these regards, overviews of systematic reviews are an efficient way to gather and summarize in a single source the best available evidence on the effectiveness of interventions (Ioannidis, 2009). They serve as a useful starting point for decision makers to unpack the evidence towards finding solutions to improve practice and identify areas where new research is needed.

Given the aforementioned, we performed a systematic review of the literature to identify meta-analyses investigating the effects of exercise interventions on depression in older adults. Specifically our purpose was: (1) to appraise past meta-analyses on exercise in late life depression; and (2) to synthesize past meta-analytical findings to inform future related policy and research.

2. Methods

2.1. Literature search

Two independent reviewers (DC and DV) conducted a systematic review of Pubmed, CINAHL, Cochrane Plus, PsycArticles, and PsycInfo from inception to August 2015. The search terms and strategy were: (elderly or older or aged) and (depression or depressive) and (exercise and physical activity) and (meta-analysis). In addition manual searches of reference lists from peer-reviewed journals were conducted.

2.2. Inclusion criteria

Meta-analyses of RCTs that investigated exercise effects on depression in older adults were included. More specifically, meta-analyses had to meet the following criteria: (a) inclusion of people with a formal diagnosis using standardized Diagnostic and

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