



Physical activity interventions for treatment of social isolation, loneliness or low social support in older adults: A systematic review and meta-analysis of randomised controlled trials



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ABSTRACT

Objectives: This article reviews the effects of physical activity (PA) interventions on social isolation, loneliness or low social support in older adults.

Design: Systematic review and meta-analysis of randomised controlled trials (RCTs).

Method: MEDLINE, EMBASE, PsycINFO, the Cochrane CENTRAL, CINAHL, were screened up to February 2017. RCTs comparing PA versus non-PA interventions or control (sedentary) condition were included. Risk of bias was assessed using the 12 criteria Cochrane Review Book Group risk of bias. The outcome measures were: social isolation, loneliness, social support, social networks, and social functioning. Standardised mean differences (SMDs) with associated 95% confidence intervals (CIs) were calculated for continuous outcomes. Meta-analysis was performed using a random effects model.

Results: The search strategy identified 38 RCTs, with a total of 5288 participants, of which 26 had a low risk of bias and 12 had a high risk of bias. Meta-analysis was performed on 23 RCTs. A small significant positive effect favouring the experimental condition was found for social functioning (SMD = 0.30; 95% CI, 0.12 to 0.49; $P = 0.001$) with strongest effects obtained for PA interventions, diseased populations, group exercise setting, and delivery by a medical healthcare provider. No effect of PA was found for loneliness, social support, or social networks.

Conclusion: This review shows, for social functioning, the specific aspects of PA interventions can successfully influence social health. PA did not appear to be effective for loneliness, social support and social networks.

1. Introduction

The absence, or poor quality, of social relations has detrimental effects on mental health and well-being, negatively impacts quality of life (QoL) and leads to the feeling of loneliness (Masi, Chen, Hawkey, & Cacioppo, 2011; Netz, Wu, Becker, & Tenenbaum, 2005). According to UK statistics, the prevalence of loneliness among older adults aged 65 years or older has been estimated to be between 6 and 22% in Great Britain in 2015 and is continuing to rise (Office for National Statistics, 2015). Older adults are considered a particularly vulnerable category of people because older adults experience an increased need in the meaningful social contacts that are consequently replaced by the family and close friends after retirement from work (Masi et al., 2011). Given this, special emphasis of healthcare professionals has been placed on the implementation of health promotion interventions to address this problem in society (Jopling, 2015).

Following the analysis of systematic reviews and meta-analyses

(Cattan & White, 1998; Cattan, White, Bond, & Learmouth, 2005; Cohen-Mansfield, Hazan, Lerman, & Shalom, 2016; Dickens, Richards, Greaves, & Campbell, 2011; Hagan, Manktelow, Taylor, & Mallett, 2014; Masi et al., 2011; Pels & Kleinert, 2016; Pettite et al., 2015; Smith, Banting, Eime, O'Sullivan, & van Uffelen, 2017; Snowden et al., 2014), there is a lack of available evidence for PA intervention effects for social health outcomes in community-dwelling older adults. Some reviews focus either on non-PA interventions in a wide diversity of participants and settings (Masi et al., 2011) or include non-experimental designed interventions, which reduce the methodological rigour of evidence (Hagan et al., 2014; Pels & Kleinert, 2016). Other are focusing on only certain social outcomes and do not consider social health as a multifaceted domain (Gillison, Skevington, Sato, Standage, & Evangelidou, 2009; Masi et al., 2011; Schechtman, Ory, & Group, 2001). Limitations of current PA interventions include insufficient sample sizes and lack of adjustment for confounding factors resulting in an inability to provide sufficient information about the

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effectiveness of treatment.

The causal mechanisms that underlie the social health effects of PA are complex comprising many components (Michie, Abraham, Whittington, McAteer, & Gupta, 2009). The independent effects of interventions on social outcomes is difficult to determine due to the multidimensional structure of social health that is lacking the precise definition of its domains (Biddle & Asare, 2011). Sub-components of social health in addition to social isolation and loneliness include social support and its functional and structural domains (Dickens et al., 2011). Loneliness is defined as a discrepancy between a person's desired and actual social relationships (Peplau & Cutrona, 1980), that is typically assessed using the UCLA loneliness scale (Russell, 1996). Social isolation is a “a state in which the individual lacks a sense of belonging socially, lacks engagement with others, has a minimal number of social contacts, and they are deficient in fulfilling and quality relationships” (Nicholson, 2012, p. 138). Social support is the comfort, assistance, and information received and shared through formal and informal contacts with others (Wallston, Alagna, DeVellis, & DeVellis, 1983).

PA is a health behaviour that can influence social health through a number of mechanisms and behaviour change techniques (Michie et al., 2011). A recent meta-analysis showed that a “self-monitoring” technique combined with one or two other techniques was included in most effective interventions of PA and healthy eating (Michie et al., 2009). However, the causal mechanisms that underlie the social health effects of PA are complex comprising many components or moderating factors (Michie et al., 2009). With this the type of PA intervention, residential settings, delivery format, comorbidity and others are important considerations which will be examined in the present review, where possible.

Mechanisms of how PA interventions might be particularly effective for improving social health outcomes have been suggested to be that, first, PA can facilitate social relationships through social connectedness arising from building friendly and trusted relationships between people during activities (Lubans et al., 2016). In addition, PA removes the individual barriers to social interaction and generates a sense of self-esteem based on social acceptance and perceived emotional support, leading to further action (Baumeister & Leary, 1995; Masi et al., 2011). Second, PA changes perceptions of people's lives associated with direct effects on quality of life, sleep volume and self-regulation skills (Lubans et al., 2016). Third, at a biological level, the feel-good effect of PA is associated with the increases in serotonin, monoamine and neurotrophin production, reductions in the stress hormone cortisol, activation of the grey matter, and the release of endogenous opioids referred to as the neurobiological hypothesis (Lubans et al., 2016). However, many PA interventions do not measure all of these aspects as potential mechanisms of effects on social health, or use them as a theoretical basis for intervention.

Several theoretical models that relate to the above mechanisms have been applied to loneliness reduction via physical activity (PA) interventions. Among them is the social compensation effect described by Ferraro and Farmer (1995)'s model, according to which engagement in a variety of physical and leisure activities by older adults with a loss of meaningful social connections compensates for or replaces this loss by increasing their peripheral social networking. The related theory of active engagement explains loneliness reduction in older adults through engagement in an active lifestyle that generates a sense of purpose through increased social support and lowered depression (Lemon, Bengtson, & Peterson, 1972; Rowe & Kahn, 1997). The tripartite model of group identification (Henry, Arrow, & Carini, 1999; Pels & Kleinert, 2016) associated with the exercise-induced change in the experience of living to an advanced age considers three aspects to explain the positive effects of physical activity: cognitive (social categorisation), affective (interpersonal attraction), and behavioral (interdependence) which seems to encompass much of the aspects of the above theories. Finally, according to the framework of “coping styles” of loneliness (Fokkema & Knipscheer, 2007), PA may reduce loneliness in two ways:

1) by improving social skills and self-confidence by engaging in a variety of social contacts during PA programmes; and 2) by changing self-perception and “seeing things in perspective” (Fokkema & Knipscheer, 2007, p. 498). Among these, the most commonly utilised is the tripartite model, which has been successfully applied to a programme of PA in lonely seniors which increased their sense of identification (Henry et al., 1999; Pels & Kleinert, 2016). However, despite these convincing theories of how PA might influence health and wellbeing positively, there is a lack of available evidence regarding the effectiveness of PA interventions for psychosocial outcomes, and the available evidence is often contradictory and sparse (Hagan et al., 2014; Pels & Kleinert, 2016).

Given that the effect of PA interventions on social isolation, loneliness and low social support in community-dwelling older adults is not well documented, a novel systematic review of RCTs is needed in order to summarise the literature. This systematic review was aimed to examine physical activity intervention effects on loneliness, social isolation or low social support in community-dwelling older adults.

The protocol for this review was registered at PROSPERO; registration number 42016036013, available from: <https://www.crd.york.ac.uk/PROSPERO/myprospero.php> (Appendix A).

2. Material and methods

This systematic review was guided by the PRISMA statement (Moher et al., 2015) (Appendix B). This is a 27-item checklist that ensures the transparency and clarity of a systematic review (Liberati et al., 2009).

2.1. Eligibility criteria

To be included in review interventions had to meet the following conditions (Appendix C):

2.2. Population

1. Community-dwelling older adults ≥ 60 years of age.
2. Healthy or with a comorbidity but mobile;
3. Without dementia or moderate to severe cognitive dysfunction. Individuals with cognitive disabilities were excluded as this might confound the measurement of loneliness and social functioning.

2.3. Interventions

The following physical activity interventions were included: gym-based, home-based, community-based, web- or telephone-based.

2.4. Comparison

PA interventions were compared with a control (or sedentary) group without any exercise or undergoing another non-PA intervention (e.g. art therapy).

2.5. Outcomes

The main outcomes for this review were: 1) loneliness; 2) social isolation; 3) social support; 4) social (support) networks; and 5) social functioning as a sub-domain of health-related quality of life (HRQL).

2.6. Study design

This review included only randomised controlled trials with a minimum of two comparison arms (PA versus non-PA interventions or versus a control sedentary condition).

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