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Review

Dance movement therapy and falls prevention

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ABSTRACT

Falls are a leading cause of morbidity, healthcare use and mortality. Dance is a popular form of physical activity among older people and previous research has suggested that it may improve various health outcomes in this population, including balance, gait and muscle performance. A systematic review of the potential benefits of dance on falls and fear of falling is lacking. Thus, we conducted a systematic review considering all randomized controls trials (RCTs) investigating if dance can reduce falls and improve fear of falling in older adults. Major databases were searched from inception until 1 March 2017 and a total of 10 RCTs were identified, which included a total of 680 people (n = 356 dance, n = 324 control). Overall, the mean age of the samples was 69.4 years, and 75.2% were female. Across four RCTs, dance therapy reduced falls versus usual care in only one study. Dance therapy improved fear of falling in two out of three included RCTs. There were no serious adverse events reported in the RCTs. In summary, we found a paucity of studies investigating the effect of dance on falls and fear of falling and the evidence base is preliminary and equivocal. Given the heterogeneity of the included samples and interventions, in addition to the short-term follow-up, no firm conclusions can be drawn. However, dance appears to be safe and, given its popularity and demonstrated benefits on other health/wellbeing outcomes in older adults, it is important that future research considers its potential benefits on falls/fear of falling in older age.

1. Introduction

A fall is defined as an event which results in a person coming to rest inadvertently on the ground or floor or other lower level [1]. It is estimated that about one third of people aging more than 65 years falls every year and that the incidence of falls linearly increases with age [2]. However, many falls go unreported and retrospective recall of falls are inaccurate and the incidence and prevalence of falls are underestimated in the elderly [2]. Falls are associated with a range of deleterious outcomes including increased morbidity, fractures, hospitalization, and elevated risk of early mortality [3]. Moreover, the economic costs associated with falls are profound [4].

Perhaps unsurprisingly, strategies to prevent falls are among the most important public health issues in geriatric medicine [5]. The current evidence suggests that exercise based and tailored interventions are the most effective interventions to reduce falls among older people [5]. A recent overview of all systematic reviews of meta-analyses of randomized control trials of falls prevention interventions, demonstrated that as a single intervention, exercise had the most consistent evidence to prevent falls in community dwelling older people [6]. Specifically, the authors found that there is consistent evidence that exercise reduces falls (including the rate, risk, and odds of falling), with 13/14 pooled analyses (93%) from 7 meta-analyses demonstrating a significant reduction and effect sizes ranged from 0.87 (relative risk 95% confidence interval = 0.81, 0.94; number of studies = 18; number of participants = 3568) to 0.39 (rate ratio 95% confidence interval = 0.23, 0.66; number of meta-analyses = 6).

Dance is rapidly gaining popularity among older individuals since it is enjoyable and may offer multi-dimensional benefits. Specifically, dance may have a beneficial effects on cardiovascular parameters [7,8], balance disturbances in patients with Parkinson [9], symptoms associated with schizophrenia [10] or depression [11]. Some observational studies showed that dancing could reduce the rate of falls in elderly people [12,13]. In a systematic review published two years ago, the authors reported that dancing seems to have positive effects on balance, gait and dynamic mobility, strength and flexibility and all these factors are closely related with falls in the elderly [14]. Despite the promising findings from the important review, falls were not considered as

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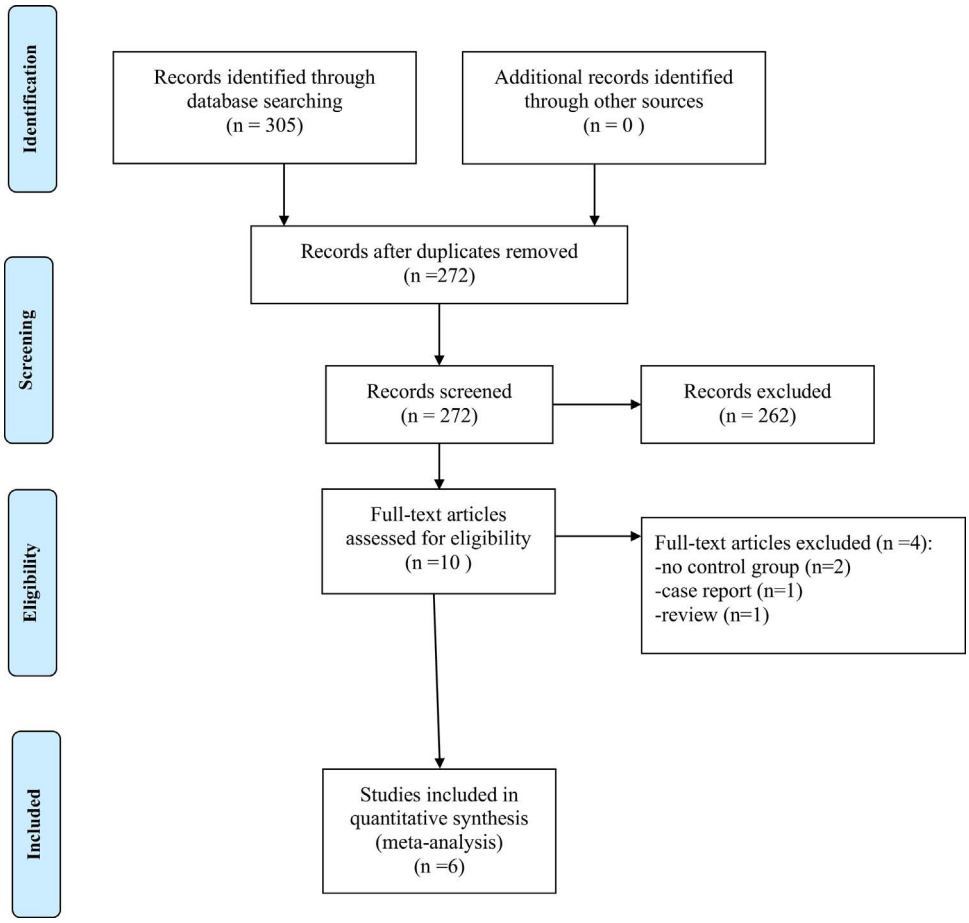

Fig. 1. PRISMA flow-chart.

outcome. Moreover, fear of falling, one of the most important predictors for falling in the elderly, was also not included [15].

Given this background, we conducted a systematic review to investigate if dancing is more effective than usual care in preventing falling and improving fear of falling through a systematic revision of the randomized controlled trials (RCTs) available.

2. Methods

This systematic review adhered to the PRISMA [16] statements and followed a structured, but unpublished protocol.

2.1. Data sources and literature search strategy

The two authors independently conducted a literature search using PubMed, EMBASE, SCOPUS, Cochrane Central Register of Controlled Trials and Clinicaltrials.gov without language restriction, from database inception until 01st March 2017 for randomized controlled trials (RCTs) investigating the effect of dancing on falls and fear of falling assessed through validated scales.

In PubMed, the following search strategy was used: "(Dance or dance movement or dance therapy or dancing) and (falls or fall or fall prevention)". An identical search was conducted in the other databases. Conference abstracts and reference lists of included articles were hand-searched to identify and potential additional relevant articles. Any inconsistencies were resolved by consensus.

2.2. Study selection

Inclusion criteria for this meta-analysis were: i) RCTs; ii) investigated the effect of a dancing program; iii) included data regarding falls or fear of falls using validated scales (such as the Falls Efficacy Scale-International, FES-I) [17]. No language restriction was placed on the included studies.

Studies were excluded if: i) did not include humans; ii) did not include a control group; iii) did not use validated scales for assessing fear of falls; iv) did not report data at follow-up evaluation regarding falls/fear of falling.

2.3. Data extraction

One author (NV) extracted key data from the included articles in a standardized Excel sheet and a second one (BS) checked the extracted data.

For each article, we extracted data about authors, year of publication, country, main condition of interest, setting, type and description of dancing program, follow-up duration (in weeks), and how falls were ascertained and which scales for assessing fear of falling were used and mean age and percentage of females (by treatment type: ALC or control group). Finally, we extracted data regarding the adverse events reported in each study.

2.4. Outcomes

The primary outcome was the incidence of falls during follow-up period in both groups. Secondary outcome was the change (between follow-up and baseline) in both groups regarding scales assessing concern of falling.