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Exercise for late-life depression? It depends

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Does exercise help older depressed adults? This question is rather simple, and one would intuit a simple answer: yes. Yet, as studies such as those reported by Martin Underwood and colleagues¹ in *The Lancet* remind us, some investigators have found it challenging to show an actual benefit on depression from exercise. Underwood and colleagues did a cluster-randomised controlled trial in which they enrolled 891 elderly residents (aged 65 years or older) of 78 care homes in England. 35 intervention homes received twice-weekly group exercise classes for residents, along with activity promotion among staff and residents and depression-awareness training for staff. 43 control homes received only depression-awareness training for staff. At the end of the 12 month study, depression scores (measured with the geriatric depression scale 15 [GDS-15]) did not differ between intervention and control groups (mean difference in GDS-15 score 0.13 [95% CI -0.33 to 0.60]).

The absence of consistency of results across trials of exercise in geriatric depression is probably multifactorial in origin, related to heterogeneity of study samples; differences in intervention type, implementation strategy, and comparator condition; and variability in placebo response. Simply stated, the joining of the concepts of exercise and geriatric depression outcomes creates sufficient methodological complexity that negative results become inevitable.

Inclusion criteria seem to have a substantial effect on results. For example, a systematic review by Bridle and colleagues² of exercise and depression severity concluded that “for older people who present with clinically meaningful symptoms of depression, prescribing structured exercise tailored to individual ability will reduce depression severity.”² To be included for review, Bridle and colleagues required that participants be clinically depressed and at least 60 years old. Such criteria are typical for geriatric exercise intervention trials and tend to lead to study samples of individuals with mild to moderate depression with a mean age younger than 75 years, making them most representative of clinically depressed younger old people. In fact, seven of nine studies included in the analysis had samples with a mean age of younger than 75 years; two others had mean ages of older than 82 years (one focusing on depression in Alzheimer’s disease). In Underwood and colleagues’ study, the mean age was 86.5 years (range 65–107). Mean age in antidepressant trials is salient; in pharmacological trials of patients older than 75 years (older old people), study drugs often fail to separate from placebo on depression outcome.³

Another key methodological issue seems to be severity of depression. Several pharmacological trials of mild to moderate major depression in middle aged and older adults have reported high placebo response rates, an event that was shown in a placebo-controlled study of exercise that also included an antidepressant drugs.⁴ In adults older than 60 years, inclusion of individuals with mild to moderate depression seems to be important to show efficacy of exercise. By contrast, recruitment of samples of older adults that subsequently characterise depression symptom severity (ie, do not require a minimum score on a

depression measure for inclusion) might result in studies which show that exercise does not prevent or decrease depression symptoms. Underwood and colleagues noted no evidence of a beneficial effect on depression symptoms, either among the entire cohort or among those with clinically significant depression at baseline (mean difference in GDS-15 score at 6 months in residents depressed at baseline 0.22 [95% CI -0.52 to 0.95]).

Type of exercise might also have a role in depression outcomes. Physical activity was associated with lower odds of depression diagnosis in adults older than 60 years.⁵ Aerobic exercise has been shown to be effective in geriatric depression.⁶ Non-aerobic exercise interventions—eg, strength training, Tai Chi Chih—have been shown to be helpful, although evidence in elderly care homes is equivocal.^{7,8} Researchers have tried to disentangle a supportive group experiential effect from exercise by modifying the exercise intervention to individualised prescribed home exercise, with positive results.⁹

Degree of comorbid cognitive impairment might affect antidepressant response to exercise in older adults. A systematic review and partial meta-analyses of physical activity interventions among patients with dementia showed improvements in physical functioning but noted little support for improvement in depression.¹⁰ In Underwood and colleagues' study, participants had moderate cognitive impairment, as measured with the mini-mental state examination, consistent with dementia.

So, what is the role of exercise in improving mood in older adults with moderately severe depression? Behavioural activation has been shown to be effective in improving depression, and one might argue that exercise is a form of behavioural activation. Aerobic exercise can increase vascular perfusion, mechanistically important since perfusion deficits have been associated with late-life depression.¹¹ Exercise might also have beneficial effects as an adjunctive treatment among older adults who partially respond to antidepressant medications. In an augmentation study of partial responders to escitalopram, compared with a health education comparator, Tai Chi Chih exercise was associated with greater reduction of depressive symptoms and increased depression remission.¹² Future studies should examine various adjunctive exercise treatments. Additionally, novel approaches such as interactive video games that have a movement or exercise component have shown promise and deserve further investigation.¹³

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