**Follow-up efficacy of physical exercise interventions on fall incidence and fall risk in healthy older adults**

*A systematic review and meta-analysis*

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**Background:**

The risk of falling and associated injuries increases with age. Therefore, the prevention of falls is a key priority in geriatrics and is particularly based on physical exercising, aiming to improve the age-related decline in motor performance, which is crucial in response to postural threats. Although the benefits and specifications of effective exercise programs have been well documented in pre-post design studies, that is during the treatment, the definitive retention and transfer of these fall-related exercise benefits to the daily life fall risk during follow-up periods remains largely unclear. Accordingly, this meta-analysis investigates the efficacy of exercise interventions on the follow-up risk of falling.

**Methods:**

A systematic database search was conducted. A study was considered eligible if it examined the number of falls (fall rate) and fallers (fall risk) of healthy older adults (≥ 65 years) during a follow-up period after participating in a randomized controlled physical exercise intervention. The pooled estimates of the fall rate and fall risk ratios were calculated using a random-effects meta-analysis. Furthermore, the methodological quality and the risk of bias were assessed. Results: Twenty-six studies with 31 different intervention groups were included (4739 participants). The number of falls was significantly (p <0.001) reduced by 32% (rate ratio 0.68, 95% confidence interval 0.58 to 0.80) and the number of fallers by 22% (risk ratio 0.78, 95% confidence interval 0.68 to 0.89) following exercising when compared with controls. Interventions that applied posture-challenging exercises showed the highest effects. The methodological quality score was acceptable (73 ± 11%) and risk of bias low.

**Conclusions:**

The present review and meta-analysis provide evidence that physical exercise interventions have the potential to significantly reduce fall rate and risk in healthy older adults. Posture-challenging exercises might be particularly considered when designing fall prevention interventions.

Source: <https://edoc.hu-berlin.de/handle/18452/20892>