



# Dance as physical exercise for older people

## AUTHORS:

Margaretha Viljoen<sup>1</sup>   
Peter F. Levay<sup>2</sup>

## AFFILIATIONS:

<sup>1</sup>Department of Psychiatry, University of Pretoria, Pretoria, South Africa

<sup>2</sup>Department of Internal Medicine, Kalafong Hospital, University of Pretoria, Pretoria, South Africa

## CORRESPONDENCE TO:

Margaretha Viljoen

## EMAIL:

[mviljoen@webafrica.org.za](mailto:mviljoen@webafrica.org.za)

## HOW TO CITE:

Viljoen M, Levay PF. Dance as physical exercise for older people. *S Afr J Sci.* 2021;117(11/12), Art. #11831. <https://doi.org/10.17159/sajs.2021/11831>

## ARTICLE INCLUDES:

Peer review

[Supplementary material](#)

## KEYWORDS:

physical exercise, dance, older people, health

## PUBLISHED:

29 November 2021

### Significance:

- Adequate physical exercise is important for the somatic and mental health of older people.
- Dance, as an alternative to structured exercise, could provide both health and social aspects.
- The potential to adapt dance style and intensity to accommodate physical limitations makes dancing suitable for many older adults.

The importance of adequate physical activity for older people cannot be overestimated. Evidence exists that physical exercise can improve quality of life; benefit brain areas involved with executive control; delay the age-related decline in functional ability; offer a degree of protection against certain physical and mental disorders; reduce the prevalence of falls by improving flexibility, balance, and muscle strength; and potentially promote longevity.<sup>1-3</sup> On cellular and molecular levels, aging is said to be marked by genomic instability, telomere attrition, epigenetic alterations, impaired protein homeostasis, deregulation of systems involved in nutrient sensing, a decline in mitochondrial integrity and biogenesis, cellular senescence, stem cell exhaustion, and changes in intercellular communication.<sup>4,5</sup> Plausible indications are that physical activity, especially aerobic and resistance training, can have positive anti-aging effects through attenuation of such cellular and molecular mechanisms.<sup>4</sup>

Not everyone likes structured exercise; however, various alternatives exist. One alternative is recreational dancing – an activity primarily selected for fun and social interaction, rather than health benefits. We briefly examined the potential benefits of amateur/recreational dance, as a form of exercise, for the health and well-being of older people. A literature search was performed through electronic databases as well as manually. Electronic databases searched were EBSCOhost Research Interface databases; Academic Search Complete; APA; CINAHL and MEDLINE.

## Health benefits of dance for older people

The effects of dance on the health and general well-being of the older population ( $\geq 65$  years), as appraised in 16 reviews, including 11 systematic reviews, covering a total of 296 individual studies, are summarised in [Supplementary table 1](#). Several reviews concluded that dance has positive/protective effects on cognitive functions<sup>6-13</sup>, such as a delay in the onset of dementia<sup>11</sup>, on memory<sup>7</sup>, including immediate and delayed recall<sup>7</sup>, and on executive functions<sup>6</sup>. Several studies claimed dance benefits quality of life<sup>9,12</sup>, mental states such as depression, anxiety<sup>9,14</sup> and general mood<sup>12</sup>, as well as psychosocial phenomena such as social interaction<sup>10,15</sup> and interpersonal skills<sup>10,11</sup>. Evidence exists that regular dance activity could reduce the risk of falling<sup>16,17</sup> by improving sensorimotor function<sup>13</sup>, balance, strength, mobility and flexibility<sup>15,17-19</sup>. A number of studies reported improvements in aerobic power, endurance, cardiovascular health<sup>18,19</sup> and metabolic disorders such as diabetes mellitus<sup>20</sup>. Indications are that bone-mineral content may benefit, but confirmation is needed.<sup>19</sup> As for other forms of exercise, it is feasible to surmise that the cellular and molecular anti-aging effects referred to in the introduction<sup>4</sup> also apply to dancing as physical exercise.

## Comparing the effects of dance to those of other forms of physical activity

Several studies found that dance, as a form of physical exercise, could be as effective as conventional structured exercise. However, variations in dance genre, dance protocols, aerobic intensity and methods of appraisal, confound a general comparison between the benefits of dance and those of other forms of physical activity. In a systematic review of seven control trials on the effects of dance on cardiovascular risks and aerobic capacity with aging, no significant differences were reported between the effects of dance and those of other types of exercise.<sup>21</sup> In a review of 28 studies, comprising 1276 participants, similar results were found for cardiovascular function and self-perceived mobility, while the effects of dance were occasionally reported as superior for certain musculoskeletal functions and blood parameters.<sup>22</sup> A pooled analysis of 11 longitudinal population-based British surveys on dance and cardiovascular disease mortality, showed that while both moderate-intensity dancing and moderate-intensity walking are inversely associated with cardiovascular disease mortality, greater risk reduction can be obtained with dancing.<sup>23</sup> Explanations for the reported superior benefits were that the social aspects of recreational dance could have acted as a buffer against psychosocial stress, and that moderate-intensity dancing often includes short bouts of vigorous intensity, thus mimicking high-intensity interval training.<sup>23</sup>

Results of studies that involve older participants in dance programmes marked by constant learning of new choreographies and movement sequences, suggest the long-term effects of such dance programmes are superior to the effects of either repetitive physical exercises or intensity-matched conventional fitness training in inducing cerebral neuroplasticity.<sup>24</sup> Dancing involves skills that are not necessarily required in other forms of exercise, such as coordination, learning of new movement sequences, integration of movement with music, as well as a number of expressive and communicative skills.<sup>25</sup> Dance thus integrates several different brain areas which then improves neuroplasticity.<sup>26</sup> Structural changes associated with dancing include increases in hippocampal volume, in grey matter volume of the left precentral and para-hippocampal gyrus, improved white matter integrity, as well as increased cortical thickness in the lateral occipito-temporal cortex, an area involved in action observation, visuomotor integration and action imitation – in other words, activities important for motor learning and executing skilled movements.<sup>26,27</sup>

Many organisations, including the World Health Organization (WHO), have recommended guidelines for physical activity for older people.<sup>28</sup> Most suggest 150–300 minutes of moderate-intensity exercise per week. This duration

most probably exceeds the time that older individuals spend on once-a-week dancing. However, while the more-is-better dose-response relationship is still maintained by many, recent indications are that significant health benefits can be gained by simply becoming physically more active.<sup>29</sup> The fact that dance is seen by many as highly enjoyable, and that enjoyment is known to be a strong predictor of perseverance with physical activity<sup>24</sup>, probably contributes to a lower attrition rate.

## Potential risks

The main risks for older people participating in dance are probably vulnerability to falling, and effects on cardiovascular morbidity. Little information is available on the occurrence of serious falls in the elderly while participating in dance as a leisure activity. Nevertheless, as for other forms of physical exertion, guidance from medical practitioners could be valuable, especially for those with chronic conditions and/or functional limitations. Similarly to the risk of falling, hardly any records could be found on negative cardiovascular events. Nonetheless, it seems feasible to assume that general guidelines apply, whatever the exercise. According to the WHO, older adults with serious cardiac diseases or those recovering from an acute cardiac event, should rather be enrolled in a cardiac rehabilitation programme involving a multidisciplinary approach, with the prescribed physical activity component consisting of a medical assessment, cardiac risk factor management and psychosocial interventions.<sup>30</sup> Some evidence exists for dance, including low-impact dance, as a supplementary tool for cardiac rehabilitation.

## Spectrum of dance-based physical activities for older people

Dance for the older person varies from that on par with dance for the much younger, to creative dance classes in nursing homes and acute hospital settings. Intensity levels for group dance classes range from gentle movements in the seated position to dynamic dance. A variety of dance-based exercises exists, including dance movement therapy, dance therapy and programmes with physiotherapy falls-prevention activities integrated into dance programmes. For further information, see the [supplementary material](#) for examples of dance as exercise for older people.

## Conclusions

Dance, through its beneficial effects on physical and mental well-being, can potentially slow down the functional decline associated with aging. Many older people join dance groups for socialising and the joy of dancing, rather than the health benefits. Dancing, although not for everyone, could potentially contribute to meeting both the health and the social aspects. As with other forms of exercise, inappropriate dance intensity could be a risk factor for some, especially those with chronic conditions and/or functional limitations, in which case guidance from a medical practitioner is advisable.

## Competing interests

We have no competing interests to declare.

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