STEP by step

## Tango for Active Ageing

# D2.1 Compendium of knowledge and good practices on tango and dance interventions for elderly well-being

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## Deliverable Information

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| **Project Acronym** | Step by Step |
| **Project Title** | Tango for Active Ageing |
| **Type of action** | Erasmus - LS |
| **Topic** | ERASMUS-SPORT-2025-SSCP |
| **Project Start Date** | 01/12/2025 |
| **Project Duration** | 12 months |
| **Work Package** | WP2 Training preparation and recruitment |
| **Deliverable** | D2.1 Project output 1: Compendium of knowledge and good practices on tango and dance interventions for elderly well-being |
| **Due Date** | Month 2 |
| **Submission Date** | 30/01/2026 |
| **Dissemination Level** [1] | PU |
| **Deliverable Responsible** | Consulta Europa |
| **Version** | 0.1 |
| **Status** | First draft |
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[1] PU= Public, CO=Confidential, only for members of the consortium (including the Commission Services), CL=Classified, as referred to in Commission Decision 2001/844/EC



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# Introduction

This compendium includes the results of the literature review performed under WP2 on studies and research works as well as good practices of tango interventions for elderly rehabilitation. The review aimed at identifying methodological approaches, tools and good practices to be adopted in the design of the STEP-BY-STEP dance-based intervention programme. The review was performed looking for publications and research work first on the benefit of dance in general for active ageing and more specifically of tango.

The review allowed also to identify organizations to collaborate with to learn about specific methods or for the further replication and widening of STEP-BY-STEP dance-based intervention programme.

## The wider benefits of dance for wellbeing and active ageing

**A growing body of international and European research shows that dance in general is a powerful multimodal activity for promoting physical, cognitive, emotional and social wellbeing in older adults**[2]. Dance combines aerobic and strength demands, complex motor coordination, music, memory, and social interaction, which makes it particularly relevant for healthy and pathological ageing.[3]

Systematic reviews and meta-analyses indicate that **dance interventions can improve multiple markers of physical fitness and function in community-dwelling older adults**. Reported benefits include:

- **Increased gait speed, balance and lower-limb strength**, with moderate effect sizes comparable to conventional exercise programmes.
- **Reduced fall risk and improved balance confidence**, particularly in programmes using ballroom, folk and creative dance styles over 8–12 weeks.
- **Better cardiovascular fitness and mobility in trials where dance is delivered at moderate intensity (e.g. 60–75% of maximal heart rate)** two to three times per week.

These effects are relevant for **maintaining independence in activities of daily living, delaying disability, and reducing health and care costs in ageing societies**.

[2] Hwang PW, Braun KL. The Effectiveness of Dance Interventions to Improve Older Adults' Health: A Systematic Literature Review. Altern Ther Health Med. 2015 Sep-Oct;21(5):64-70. PMID: 26393993; PMCID: PMC5491389.

[3] Clifford, A. M., Shanahan, J., McKee, J., Cleary, T., O'Neill, A., O'Gorman, M., … Ní Bhriain, O. (2023). The effect of dance on physical health and cognition in community dwelling older adults: A systematic review and meta-analysis. *Arts & Health*, *15*(2), 200–228. https://doi.org/10.1080/17533015.2022.2093929



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## Cognitive benefits and dementia prevention

Dance is consistently associated also with favourable cognitive outcomes in later life. A systematic review on dance and cognition in healthy older adults found that dance programmes (ballroom, social, contemporary) can improve **global cognition, attention, executive function and memory, with effects often larger than those of simple walking or stretching**. A more recent review focused on brain health concluded that **dance interventions may help counteract age-related cognitive decline and support brain reserve, especially when they are cognitively challenging and socially engaging**.[4]

Epidemiological and interventional work suggests that **regular social dancing is associated with lower risk of developing dementia**, even after adjusting for other lifestyle factors[5]. National projects such as DiADEM (Dance against Dementia[6]) are testing structured dance programmes as non-pharmacological approaches to support cognition, mood and quality of life in people at risk of or living with dementia.

## Emotional wellbeing and mental health

Reviews of dance programmes for older adults consistently report improvements in mood, vitality and self-esteem. **Dance-based interventions have been associated with reductions in depressive symptoms and anxiety scores**, using standard scales such as the Geriatric Depression Scale. Qualitative studies emphasise feelings of joy, self-expression, empowerment and "feeling alive" that older participants attribute to dancing, especially when music and movement connect with their personal histories and cultural identities[7].

**These psychosocial effects are particularly relevant for older people facing loneliness, bereavement or chronic illness, for whom dance can provide a meaningful, non-stigmatising way to engage in health-promoting activity**.

## Social connectedness and participation

**Dance is intrinsically social and can strengthen relationships, build community and reduce loneliness in older age. Group dance classes, social**

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[4] Mónica Muiños, Soledad Ballesteros, Does dance counteract age-related cognitive and brain declines in middle-aged and older adults? A systematic review, Neuroscience & Biobehavioral Reviews, Volume 121, 2021, Pages 259-276, https://doi.org/10.1016/j.neubiorev.2020.11.028.

[5] https://www.dementiasplatform.uk/news-and-media/blog/can-dance-help-defend-against-dementia

[6] https://www.researchgate.net/publication/383437295_DiADEM-Dance_against_Dementia_Effect_of_a_Six-Month_Dance_Intervention_on_Physical_Fitness_in_Older_Adults_with_Mild_Cognitive_Impairment_A_Randomized_Controlled_Trial

[7] Fonseca I, Rueda M, Cabanzo C. The effect of dance interventions on well-being dimensions in older adults: a systematic review. Front Sports Act Living. 2025 Jul 25;7:1594754. doi: 10.3389/fspor.2025.1594754. PMID: 40787603; PMCID: PMC12331657.



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**dances and intergenerational projects provide regular opportunities to meet others, cooperate, and share positive experiences, which has been linked to enhanced social support and perceived quality of life**.

Local and national community programmes frequently use traditional, folk or ballroom dance as inclusive cultural activities that promote intergenerational dialogue and social participation. Examples include municipal dance clubs for seniors, dance-for-health initiatives in cultural centres.

## What neuroscience tells us about dance and the ageing brain

Neuroscientific studies over the last decade have begun to explain why dance may be particularly powerful for brain health in older age. **Dance simultaneously recruits motor, sensory, cognitive and emotional networks, and this complex stimulation appears to promote neuroplasticity and functional re-organisation in ageing brains[8]**.

A landmark trial comparing dance training with conventional fitness training in healthy seniors showed that only the dance group exhibited significant increases in hippocampal volume and improvements in balance[9]. These hippocampal changes are notable because hippocampal atrophy is a hallmark of age-related cognitive decline and Alzheimer's disease. Other neuroimaging studies and reviews report that dance can:

- Enhance connectivity and efficiency within and between large-scale brain networks, including the sensorimotor network, dorsal attention network and default-mode network, which support movement, attention and self-referential processing[10].
- Increase grey-matter volume or preserve cortical thickness in regions supporting motor planning, spatial navigation, executive functions and emotional

**Recent integrative reviews argue that dance-based interventions can be conceptualised as a form of "neurocognitive rehabilitation**

[8] Prates RACS, Kaczmarska M, Senger D, Piña-Escudero SD, Light SW, Pintado-Caipa M, Battista P, Tahir P, Pitsch E, Allen IE, Possin KL, Haas AN. Effects of dance interventions on brain health for older adults with cognitive impairment: an umbrella review. BMC Geriatr. 2025 Nov 5;25(1):846. doi: 10.1186/s12877-025-06483-7. PMID: 41194042; PMCID: PMC12587612.

[9] Rehfeld K, Müller P, Aye N, Schmicker M, Dordevic M, Kaufmann J, Hökelmann A and Müller NG (2017), Dancing or Fitness Sport? The Effects of Two Training Programs on Hippocampal Plasticity and Balance Abilities in Healthy Seniors. Front. Hum. Neurosci. 11:305.doi: 10.3389/fnhum.2017.00305

[10] Basso JC, Satyal MK and Rugh R (2021) Dance on the Brain: Enhancing Intra- and Inter-Brain

Synchrony. Front. Hum. Neurosci. 14:584312.doi: 10.3389/fnhum.2020.584312



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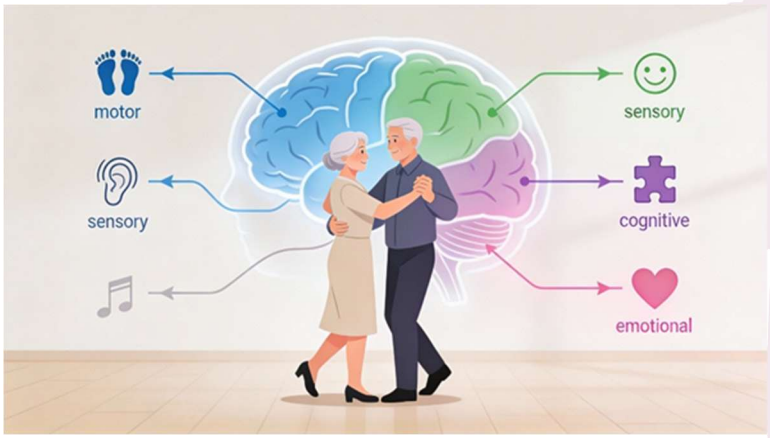
regulation, such as the parahippocampal region, cingulate cortex and insula[11].

- Support "cognitive reserve" by combining physical activity, cognitive challenge, emotional engagement and social interaction in a single enriched experience, which may help the brain better cope with age- or pathology-related changes[12].

**Recent integrative reviews argue that dance-based interventions can be conceptualised as a form of "neurocognitive rehabilitation**", with potential applications in mild cognitive impairment, Parkinson's disease and other neurodegenerative conditions. For the STEP-BY-STEP project, this broader neuroscience of dance reinforces the rationale for using tango and related dance forms as complex, enjoyable tools to support active ageing, not only at the level of muscles and mood but also at the level of brain structure and function.




## Evidence and good practices on tango with older adults

Over the last two decades, **tango-based interventions with older adults have moved from small, exploratory initiatives to well-designed clinical trials and structured programmes in real-world settings**. Together, these experiences show that adapted tango can be feasible, safe and meaningful for very diverse groups of older people, including those living with cognitive impairment, dementia, fall risk, Parkinson's disease and sensory limitations. The following synthesis brings together core clinical studies, thematic good practices and evaluation tools to inform the STEP-BY-STEP model.

One of the most important strands of evidence comes from **nursing homes, where tango-therapy has been used with residents who are often very old and frail**[13]. In a multicentre study by Bracco and colleagues, **54 nursing-home**

[11] Lavinia Teixeira-Machado, Ricardo Mario Arida, Jair de Jesus Mari, Dance for neuroplasticity: A descriptive systematic review, Neuroscience & Biobehavioral Reviews, Volume 96, 2019, Pages 232-240,

ISSN 0149-7634, https://doi.org/10.1016/j.neubiorev.2018.12.010.

[12] Hackney ME, Burzynska AZ, Ting LH. The cognitive neuroscience and neurocognitive rehabilitation of dance. BMC Neurosci. 2024 Nov 6;25(1):58. doi: 10.1186/s12868-024-00906-8. PMID: 39506634; PMCID: PMC11539675.

[13] Bracco L, Cornaro C, Pinto-Carral A, Koch SC, Mourey F. Tango-Therapy Intervention for Older Adults with Cognitive Impairment Living in Nursing Homes: Effects on Quality of Life, Physical Abilities and Gait. Int J Environ Res Public Health. 2023 Feb 16;20(4):3521. doi: 10.3390/ijerph20043521. PMID: 36834217; PMCID: PMC9963458.



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**residents (average age around 85 years), many with significant cognitive impairment (mean MMSE about 14.5), took part in group tango-therapy sessions**. The intervention followed a structured format with a gentle warm-up, simple tango-based walking patterns in different directions, improvisation and opportunities for social interaction, frequently followed by a coffee or social moment to extend the sense of connection. Educators used the Sistema Dinzel approach, which emphasises improvisation, relational connection and therapeutic intent rather than perfecting formal dance technique.

The results were encouraging on several levels. Attendance was very high, with around 92% of possible sessions attended, and participants consistently reported high levels of subjective well-being immediately after sessions (on average 4.5 out of 5). While physical abilities, gait and functional capacities remained broadly stable over time, which is notable in such a frail group where decline is expected, quality of life, measured with the **Quality of Life in Alzheimer's Disease** (QoL-AD) scale, improved significantly. For the STEP-BY-STEP project, **this study confirms that tango can be delivered safely in institutional settings to very frail older adults with cognitive impairment, while supporting perceived well-being, quality of life and engagement.**

Complementing this quasi-experimental work, **a randomised controlled trial in a specialised dementia unit compared tango-therapy with a more conventional physical exercise programme**. Thirty-one residents with dementia, aged between 65 and 93, were randomly assigned to either a tango group or a standard group exercise control. Over three months, participants in the tango group attended one-hour sessions twice a week, led by a dance/movement therapist and a musician, while the control group followed traditional group physical exercises with the same frequency. The trial found that **tango improved gait speed more than the exercise control and mitigated decline in functional mobility and independence in activities of daily living**, as measured by the Katz Index. Importantly, quality of life was maintained in the tango group, whereas a decline might otherwise have been expected in this population. The authors concluded that **tango represents an effective non-pharmacological strategy to counter functional decline in older people with dementia**, providing high-quality evidence that a structured tango programme can outperform generic exercise on some key outcomes[14].

[14] Bracco L, Pinto-Carral A, Hillaert L, Mourey F. Tango-therapy vs physical exercise in older people with dementia; a randomized controlled trial. BMC Geriatr. 2023 Oct 24;23(1):693. doi: 10.1186/s12877-023-04342-x. PMID: 37875856; PMCID: PMC10598907.



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Outside institutional care, community-based programmes have investigated adapted tango with older adults living independently. In a **trial** by Hackney and Earhart, **74 older adults aged 59 to 95 years (most of them over 80) participated in either a 12-week adapted tango programme or a health-education control**[15]. The tango group attended 20 sessions of 90 minutes that focused on posture, weight transfer, varied walking patterns, partner work and rhythm, while the control group received health information without structured physical activity. Participants who danced tango showed significant improvements in mobility, backward and fast gait speed, and motor–cognitive performance compared with the education group, and many of these gains were still evident three months after the end of the programme. Interestingly, **these benefits did not depend on previous dance experience, suggesting that adapted tango can be accessible and effective even for those who have never danced before**.

**Tango represents an effective non-pharmacological strategy to counter functional decline in older people with dementia.**

Other community **trials have directly compared tango with walking**. McKinley and colleagues recruited **30 non-demented older adults aged 62 to 91 years who were at risk of falling and randomised them to either a tango class or a walking group**[16]. Over ten weeks, both groups attended 40 hours of activity (two-hour sessions twice per week), allowing a fair comparison between a social dance approach and a more conventional low-cost intervention like walking. **Both groups improved over time, but the tango participants experienced greater clinical gains in balance confidence and sit-to-stand performance, and they also reported high levels of enjoyment and social engagement**. These findings suggest that tango is at least as effective as walking for improving physical function in older adults at risk of falls, with added advantages in balance confidence and the complexity of gait.

More recently, a randomised controlled trial in Ljubljana has explored Argentine tango specifically as a fall-prevention strategy for active older adults[17]. In this study, **36 healthy adults aged 65 to 70 years attended a 12-week programme of 90-minute tango classes twice a week**, using

[15] Hackney ME, Byers C, Butler G, Sweeney M, Rossbach L, Bozzorg A. Adapted Tango Improves Mobility, Motor-Cognitive Function, and Gait but Not Cognition in Older Adults in Independent Living. J Am Geriatr Soc. 2015 Oct;63(10):2105-13. doi: 10.1111/jgs.13650. Epub 2015 Oct 12. PMID: 26456371.

[16] McKinley P, Jacobson A, Leroux A, Bednarczyk V, Rossignol M, Fung J. Effect of a community-based Argentine tango dance program on functional balance and confidence in older adults. J Aging Phys Act. 2008 Oct;16(4):435-53. doi: 10.1123/japa.16.4.435. PMID: 19033604.

[17] Purkart B, Bertoncelj B, Podlogar A, Samardzija Pavletic M. Improving Postural Stability in Active Older Adults: Argentine Tango Dance as an Alternative Fall-prevention Strategy. Altern Ther Health Med. 2023 Jul;29(5):201-209. PMID: 35325871.



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TangoFloorTec[18] and BA Tango Biomechanics methods adapted for older bodies, along with improvisational dancing and breathing work at the end of each session. After three months, the tango group showed significantly better postural stability than controls, with large effect sizes on measures of centre-of-pressure and balance. No falls were recorded during the programme and tango was well tolerated. This trial provides strong support for **including tango as a fall-prevention component in active senior programmes** and illustrates the value of a biomechanically informed tango curriculum.

Evidence also indicates that shorter, more intensive tango blocks can be beneficial, even for frail older adults. Hackney and Earhart evaluated short-duration intensive Argentine tango courses with mixed groups including frail elderly participants and people with Parkinson's disease in community settings. Compared with traditional exercise or walking groups, those who practised tango showed greater improvements in balance and complex gait tasks. The authors highlight that tango is enjoyable and suitable for both healthy older adults and those with neurological conditions, and that even intensive short-term interventions can produce meaningful gains. This is particularly relevant for Erasmus+ contexts where project timelines or resources may favour shorter pilots[19].

Another relevant good practice example comes from an adapted tango intervention for older adults with age-related macular degeneration, a condition that causes significant visual impairment and can markedly limit daily functioning and social participation. The "Tango programme for individuals with age-related macular degeneration" pilot, developed by BA Tango[20], involved older people with visual loss participating in a modified Argentine tango programme specifically designed to accommodate their sensory limitations. Findings indicate that, despite these impairments, participants showed improvements in cognitive functioning, performance in complex tasks, and overall sense of well-being, while the programme itself proved feasible to implement and safe to run.

The adaptation strategy relied heavily on partnering and tactile communication: participants used the embrace, the shared axis of the couple, and continuous contact at the chest and arms to follow movement and maintain coordination, effectively compensating for reduced visual information. This demonstrates that tango can be inclusively adapted for individuals with sensory impairments, aligning with the STEP-BY-STEP project's ambition to design activities that reach older adults with multiple

[18] TangoFloorTec™ is a method developed by Andreja for tango learning working directly on the floor. (https://studio.ba-tango.com/domov)

[19] Hackney ME, Earhart GM. Short duration, intensive tango dancing for Parkinson disease: an uncontrolled pilot study. Complement Ther Med. 2009 Aug;17(4):203-7. doi: 10.1016/j.ctim.2008.10.005. Epub 2009 Jan 7. PMID: 19632547; PMCID: PMC2731655.

[20] www.youtwocantango.com



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chronic conditions and functional limitations, including those affected by visual disability.

Finally, tango has been embedded in broader multimodal interventions targeting mild cognitive impairment and dementia prevention. The **STRENGTH project**, for example, is a large randomised controlled trial planned with 300 adults aged 60 and over with mild cognitive impairment[21]. In this model, adapted tango is the primary physical activity component within a six-month multidimensional programme that also includes music therapy, cognitive training, social activities and psycho-education[22]. The protocol explicitly argues that **single-domain interventions tend to have limited long-term effects, while tango is chosen as a low-impact, enjoyable activity that supports mobility, balance, mood and cognition in an integrated way**. Tango is also highlighted for its potential to reduce anxiety and depression and to improve activities of daily living and quality of life in older adults. Although final outcomes from STRENGTH are still pending, the project already provides a strong example of how tango can be integrated into multidomain dementia-prevention strategies.

## Main insights and lessons learned from the review

Previous experiences with tango programmes for older adults offer several lessons that can be directly integrated into the design of the STEP-BY-STEP intervention. These lessons concern both practical aspects of class delivery and pedagogical approaches that maximise the physical, cognitive and emotional benefits of tango for elderly participants.

### Key practice features

Safety strategies need to be carefully planned according to participants' health status and functional abilities, for example by providing closer individual supervision when needed and allowing the use of chairs or walls for support. A **progressive** warm-up should be included in every session to promote joint mobility and reduce the risk of injury, and can incorporate seated movements and simple breathing exercises for participants with lower fitness levels. Body awareness can be enhanced through targeted exercises focusing on weight shifting, directional changes, turning on one leg and controlled modulation of step length. The technical content of classes should prioritise simple walking patterns and small, manageable figures as the core of tango teaching, rather than complex choreography. Throughout, strong

[21] https://clinicaltrials.gov/study/NCT04146818

[22] Giuli C, Paoloni C, Santillo E, Balietti M, Fabbietti P, Postacchini D, Piacenza F. Study of the effects of adapted Tango and multidimensional intervention in pREvention of dementia in agiNG: developing healTHy lifestyle programs (STRENGTH Project)-the experimental protocol of a prospective randomised controlled trial. Aging Clin Exp Res. 2020 Dec;32(12):2529-2537. doi: 10.1007/s40520-020-01504-4. Epub 2020 Mar 2. PMID: 32124422; PMCID: PMC7680307.



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emphasis should be placed on the embrace, partner connection and sensory engagement (touch, hearing and vision), as these elements support both balance and emotional connection.

## Duration and framing of the intervention

Evidence from existing programmes suggests that weekly or twice-weekly tango classes over a period of around 10–12 weeks offer an appropriate frequency and duration to generate meaningful benefits while remaining feasible for older adults. Scheduling a short post-session social time, such as sharing a coffee, can further strengthen social bonds and group cohesion, which are central to well-being in late life. It is also important that the tango sessions are framed and communicated as enjoyable social dance classes rather than as “rehabilitation”, in order to support motivation, dignity and long-term adherence.

## Measuring the benefits

Validated tools exist to assess the physical and cognitive benefits of tango-based interventions, including measures of mobility, balance and cognitive functioning. STEP-BY-STEP partners will consider the feasibility of applying a small set of these instruments, for example by assessing participants’ physical and cognitive status at the beginning and at the end of the programme, to document changes over time in a structured and comparable way.



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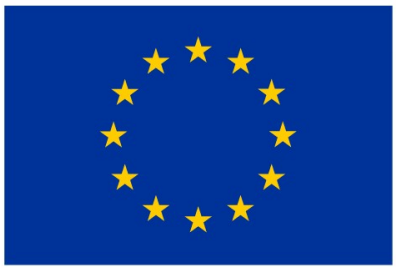

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