

# Cognitive and Integrated Intervention Therapy in the Geriatric Population and its Benefits on Daily Living Activities and Quality of Life: A Narrative Review

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## ABSTRACT

Physiotherapists have expanded their scope into a wide array of fields, including various cognitive-based therapies and mixed integrated intervention therapies. Multiple databases were used in present literature review, including Medline, PubMed, Scopus, Web of Science, and Pedro, which consisted of research studies, systematic reviews, and meta-analyses published between 2002 and 2022. The keywords searched were: cognitive, geriatric, daily living activities, life quality, integrated therapy. Out of the 163 articles retrieved, 52 primary matching articles were included in the review, and 111 articles were excluded as they did not meet the inclusion criteria. Among the matching articles, 39 showed benefits in Quality of Life (QoL) in geriatric individuals with interventions of cognitive therapy and other integrated therapies such as art therapy and music therapy, using valid and reliable outcome scales. The findings and corroborations from these studies indicated the positive effects of cognitive therapy and various integrated intervention therapies on daily living activities and life quality in the elderly population. There is limited data in the literature about the effects of cognitive and integrated intervention therapy in the elderly population. The primary aim of present review study was to analyse the existing available resources and evidence concerning the effects of cognitive therapy and integrated intervention therapy in geriatric individuals.

**Keywords:** Cognitive therapy, Gerontology, Health-related quality of life, Physiotherapy

## INTRODUCTION

Ageing is an irreversible and inevitable process, and in the present era, every individual wishes to age gracefully and independently. Geriatrics refers to medical care for older adults, a cohort that is difficult to define precisely. The term "elderly" is typically favoured, for >65 of age frequently [1]. Precise medical care is not possible, and people tend to suffer from acute or chronic medical conditions in their later phase of life. These diseases, disorders, and/or ailments do affect one's Activities of Daily Living (ADLs or ADL) and QoL. ADLs is a word used in healthcare to refer to people's daily self-care activities, and Katz S first coined the term ADLs in the 1950s [2]. Physiotherapists and other health professionals frequently use ADLs as a measurement of the functional status within the elderly population. QoL has been defined by the World Health Organisation (WHO). QoL is defined as an individual's perception of their position in life in the context of the culture and value system in which they live and in relation to their goals, expectations, standards, and concerns [3]. Established and documented studies and researches suggested that physiotherapy has been extremely beneficial in improving ADLs and, thereby, QoL in the elderly population [4,5]. Physiotherapists have expanded their scope into a wide array of fields, including several cognitive-based therapies and mixed integrated intervention therapies. Cognitive interventions involve programs that specifically train cognition through teaching skills and strategies for improving functioning in one or more cognitive domains [6]. Cognitive therapy benefits the elderly in various aspects; for instance, in a study, it was stated that cognitive behavioural therapy, has been proven beneficial in older adults [7]. Cognitive intervention therapies have demonstrated their effects in the cognitive betterment and retention of cognitive function in geriatric individuals with or without cognitive decline.

Another study reported a tailored multicomponent exercise training intervention for reversing frailty and improving physical function,

cognitive, emotional and social network determinations in frail older adults [8]. People should adopt physical activity and exercise as part of their lifestyle to alleviate the negative impact of ageing on the body and the mind [9]. Training program improves cognitive function, muscle endurance, aerobic conditioning, and balance in older adults with Mild Cognitive Impairment [10]. Physical activity, notably multimodal and mind-body exercise, offers benefits to cognition in older individuals [11].

Integrated intervention therapies are a new set of treatment approaches based on physiotherapy and occupational therapy backgrounds that have been seen to be advantageous in the betterment of the elderly health. Integrated intervention therapies mainly consist of art therapy, expressive therapy, dance therapy, and music therapy. The positive effects of integrated intervention therapy in geriatric individuals with or without acute or chronic medical conditions are highlighted. For instance, a study described the positive effects of Salsa dance therapy as a primary intervention and its impact on functional recovery in a geriatric patient with multiple impairments [12]. There is limited data in the literature about the effects of cognitive and integrated intervention therapy in the elderly population. Therefore, the primary aim of the review was to provide a narrative summation of literature suggesting the positive outcomes of cognitive and integrated intervention therapy in the geriatric population for Daily Living Activities and QoL.

To review the literature, searches of the target literature were conducted on multiple databases, including Medline, PubMed, Scopus, Web of Science, and Pedro from 2002 to 2022. The search terms or keywords used were: "Cognitive Exercise in Geriatric Persons," "Integrated Therapy," "Art Therapy," "Music Therapy," "ADLs and Geriatric People", "ADLs and Physiotherapy," "QoL and Geriatric Individuals," and "QoL and Physiotherapy".

Inclusion criteria were as follows: a) articles should be original research studies, systematic reviews, meta-analyses, or literature

reviews; b) studies that were in the English language or could be translated to English; c) studies from 2002 to 2022; d) participants were older adults aged 60 years or older.

Exclusion criteria were as follows: a) non randomised trials; b) uncontrolled trials.

Several procedures were administered in the data collection and analysis, which were executed by two review authors. Both review authors collaboratively developed the search strategy before completing the search. The search terms were developed collaboratively by the two review authors, referencing terms used were similar to previous systematic reviews and meta-analyses, as well as terms used by individual study authors from 2002 to 2022. The first author performed the search and extracted the data. Data extracted from the articles included: a) author(s) and year of publication; b) type of study; and c) main findings. The authors discussed the data collection process from time to time, particularly when differences of opinion emerged and published data was not

clearly mentioned. All disagreements were resolved by consensus before the final analysis. A descriptive, analytical approach was used to summarise the data. Initially, during the title and abstract reviews, a total of 163 potentially pertinent articles were found. Studies that met the inclusion criteria were incorporated for full-text review. During this process, 96 studies were excluded as they did not meet the inclusion criteria. Regrettably, nine articles were omitted from the review study due to the unavailability of full texts. Additionally, four other articles were conference abstracts without adequate details for inclusion, and two articles were not included as they were clinical trials yet to yield results. A total of 52 primary matching articles were included in the review. Of these, 13 articles did not consider reliable and valid outcome scales for ADLs and/or QoL, while 39 showed benefits in ADLs and/or QoL in geriatric individuals with interventions such as cognitive therapy and other integrated therapies like art therapy and music therapy, using standard outcome measures [Table/Fig-1] [13-51].

Author(s) and year of publication	Type of study	Main findings
Wolinsky FD et al., 2006 [13]	Single-blind, randomised controlled trial	The results found that participants in the speed-of-processing intervention arm had less substantial HRQoL decrease in comparison to the control group, and all the participants in the memory and reasoning arms were in parallel to the control group. The study concluded that all the interventions enhanced the cognitive ability. But, the speed-of-processing arm protected against substantial therapeutically pertinent decrease in HRQoL.
Willis SL et al., 2013 [14]	Experimental study	The authors conducted a study to evaluate the long-term effects of cognitive training on everyday functional outcomes in older adults. The study concluded that, cognitive training in the intervention group resulted in enhanced cognitive abilities; which continued five years after the start of the intervention, in comparison to the control group.
Winocur G et al., 2007 [15]	Randomised controlled	The study evaluated changes in psychosocial factors for cognitive rehabilitation in the elderly. The results indicated the use of the rehabilitation program which extended into the psychosocial domain. This reinforces the valuable relationship between psychosocial aspects and cognitive performance in the geriatric individuals.
Beswick AD et al., 2008 [16]	Systematic review and meta-analysis	The effect of complex interventions to enhance physical function and thereby retain independent living in geriatrics was evaluated. It was interpreted that the used interventions help geriatric individuals to having an independent and safe life.
Irigaray TQ et al., 2010 [17]	Randomised controlled	The authors conducted a research to evaluate the effects of a cognitive training on the Quality of Life (QoL) and well-being of healthy elders. The results showed that after training, the elderly, presented better cognitive performance, better perception of QoL and better scores of psychological well-being.
Theill N et al., 2013 [18]	Randomised controlled	The effect of simultaneously performed cognitive and physical training in older adults was assessed. It was concluded that simultaneous training of cognitive and physical abilities presents a promising training concept to improve cognitive and motor-cognitive dual task performance, offering greater potential on daily life functioning.
Seinfeld S et al., 2013 [19]	Randomised controlled	The authors conducted a study to analyse the effects of music learning and piano practice on cognitive function, mood and QoL in older adults. The results showed that the use of regular piano diminished depression, thereby persuading a positive mood and enhancing psychological and physical QoL of the old people. Also, playing the piano regularly and acquiring to read music could be a beneficial way to encourage cognitive reserve and boost well-being in the elderly.
Kwok T et al., 2013 [20]	Randomised controlled	The authors researched to check the effectiveness of cognitive training among Chinese elderly in Hong Kong. The findings indicated that the use of cognitive based intervention has been successful to refine and upgrade the cognitive function and QoL for community-dwelling Chinese old individuals residing in Hong Kong.
Noice T et al., 2013 [21]	Literature review	A review study was done to check the benefits and challenges of participatory arts for older adults. After examining 31 studies, the study revealed an overwhelmingly positive response on cognitive/affective/quality-of-life outcomes for various participatory art forms.
Maujean A et al., 2014 [22]	Systematic review	The authors conducted a systematic review of randomised controlled studies on the effect of art therapy. The results indicated that art therapy may be useful across a wide range of populations, with the possible exception of people with schizophrenia.
Rebok GW et al., 2014 [23]	Randomised, controlled single blind trial	The authors conducted a trial study on 10-year effects of the active cognitive training on cognition and everyday functioning in older adults. The study concluded that ACTIVE cognitive based intervention resulted in smaller amount of reduction in IADL in comparison to the control group. It was also interpreted that reasoning and speed training enhanced cognitive abilities which sustained for 10 years.
Han HJ et al., 2014 [24]	Randomised controlled	The authors did a research study to analyse the effect of group musical therapy on depression and Activities of Daily Living (ADL) in patients with cognitive decline. The study showed a significant reduction in depression and anxiety after musical therapy ( $p<0.001$ ) and Activities of Daily Living (ADL) markedly improved after all the sessions of musical interventions ( $p<0.001$ ). The study concluded that group music therapy is a safe and effective method for treating depression and anxiety, and also improving ADL in patients with cognitive decline.
Kelly ME et al., 2014 [25]	Systematic review and meta-analysis	A systematic review and meta-analysis was conducted to assess the impact of cognitive training and mental stimulation on cognitive and everyday functioning of healthy older adults. Meta-analysis results revealed that, cognitive training boosted performance on measures of executive function (working memory, $p=0.04$ ; processing speed, $p<0.0001$ ) and composite measures of cognitive function ( $p=0.001$ ). Cognitive training also enhanced fulfilment on the memory aspect (face-name recall, $p=0.02$ ; immediate recall, $p=0.02$ ; paired associates, $p=0.001$ ) and subjective cognitive function ( $p=0.01$ ), in comparison to no intervention. The study found that cognitive training interventions were effective in improving memory and subjective measures of cognitive performance relative to no intervention, and composite measures of cognitive function and executive functions relative to active controls.
Corbett A et al., 2015 [26]	Randomised controlled trial	An online randomised control trial was done to analyse the effect of an online cognitive training package in healthy older adults. The study concluded that online cognitive training bestowed noteworthy advantages to cognition and function in elderly.
Cho ML et al., 2015 [27]	Randomised controlled	A study was conducted to check the outcome of a cognition based enhancement group training intervention on ADL, cognition, and depression in the demented geriatric individuals. It was concluded that cognitive enhancement group training programs may have positive effects on daily living activities, cognition, and depression.
Cantarella A et al., 2016 [28]	Experimental study	A study was performed to check the benefits in tasks related to everyday life competences after working memory training in older adults. The result displayed that the trained group showed specific benefits and transfer effects to one of the everyday abilities measures (the everyday problem test) and in the two reasoning tasks and it was concluded that working memory training can positively impact cognitive functioning and, more importantly, older adults' abilities in everyday living.

Hagovska M and Nagyova I, 2016 [29]	Experimental study	A randomised control study was conducted to compare the effectiveness of cognitive and physical training on cognitive functions and the transfer of ADL. The study concluded that the combined cognitive and physical training had better efficacy for most cognitive functions and ADL when compared with the physical training only.
Mewborn CM et al., 2017 [30]	Systematic review and meta-analysis	The authors conducted a systematic review and meta-analysis of randomised-controlled trials to review the effect of cognitive interventions for cognitively healthy, mildly impaired, and mixed samples of older adults. A total 97 studies were reviewed which resulted that cognitive interventions produce a small, but significant, improvement in the cognitive functioning and living activities of older adults.
Kim DJ, 2017 [31]	Randomised controlled	A study was conducted to evaluate the effects of a combined physical activity, recreation, and art and craft program on ADL, cognition, and depression in the elderly. The results manifested improvement in daily living activities in both the tested genders, cognitive function enhanced immensely, and as a result, depression levels diminished which was especially noted in women. The study indicated that a program combining physical and recreational activities, as well as arts and crafts, had positive effects on the health of the elderly and provided evidence for managing their health.
Garrido-Pedrosa J et al., 2017 [32]	Systematic review	The authors conducted a systematic review to test the effectiveness of cognition-focused interventions in ADL performance in people with dementia. The study suggested that multi-component programs that include cognitive rehabilitation or cognitive stimulation could maintain or improve functionality in people with dementia.
Leow MQH et al., 2017 [33]	Pilot study	A pilot study on feasibility and acceptability of a music therapy program for healthy individuals in the community was done. The results revealed that the music therapy program helped to increase physical activity and social engagement, which could potentially serve to reduce cognitive decline and depression.
Roswiyan R et al., 2017 [34]	Scoping review	The authors conducted a scoping review on the consequences of combined visual art activities and physical exercise for geriatric individuals on QoL. The results showed that 70% of the researches outlined the positive effect of combining both the interventions. The findings from present review indicate that an intervention combining visual art activities and physical exercise may offer psychological, cognitive, and physical health benefits for older people with different psychological and physical problems.
Deepak A et al., 2018 [35]	Experimental study	A study was done aimed to see the outcome and comparison of cognitive remedial therapy versus functional adaptation skills training in enhancing cognitive ability and ADL in patients with schizophrenia. It was concluded that cognitive remediation therapy is an efficient and beneficial therapy protocol in treating the cognitive ability and ADL in patients with schizophrenia and hence, can be used merged with other different therapy protocols.
Abrahan VD et al., 2019 [36]	Experimental study	The authors conducted a study to check the benefits of music therapy in the QoL of older adults. The results showed that the music therapy attendees had higher scores in terms of total QoL in older adults.
Gavelin HM et al., 2020 [37]	Systematic review and meta-analysis	A systematic review and network meta-analysis of randomised controlled trials was conducted to check the combination effect of physical and cognitive training in geriatric individuals with and without cognitive impairment. The results showed that parallel training was the most effective approach for cognition, which was followed by combined interventions one after the other and then cognitive training alone. For physical based outcomes, parallel and sequential training showed similar effects as exercise alone.
Vaartio-Rajalin H et al., 2020 [38]	Scoping review	A scoping review was done to check the impact of art making and expressive art therapy in adult health and nursing care. A total of 42 papers were finally included. The study concluded that art activities were appropriate on all aspects and enhanced person centeredness, and therefore, should be considered as an integral aspect of health care and nursing teaching.
Lee J and Lee AY, 2020 [39]	Randomised controlled	The authors performed a study to assess whether a home-based cognitive intervention treatment can be beneficial on cognitive improvement for the old people living alone. The study proved that active cognitive interventions could provide feasible benefits to boost cognition, emotion, and functional abilities and regular cognitive-care services are necessary to reduce the dementia risk for the elderly who live alone within the community.
Chan SY and Chen CF, 2020 [40]	Quasi-experimental	The authors conducted a study to analyse the effects of an active music therapy program on functional fitness in community older adults. The results showed that at 1-month, the experimental group had greater improvement in cardiopulmonary fitness, upper body flexibility, lower body flexibility, upper limb muscle power, lower limb muscle endurance, and balance than the comparison group. These significant improvements persisted through the 3-month intervention. The study concluded that active group music therapy enhanced six items of functional fitness in elderly people of the community.
Hanser SB, 2020 [41]	Editorial	An editorial on the effect of music therapy in geriatrics revealed that music therapy and music-based interventions can affect health and well being in the geriatric population.
Jung YH et al., 2020 [42]	Randomised controlled	A study was done to assess the effect of the integrated program comprising cognitive training, art therapy, and music therapy in patients with Alzheimer's Disease (AD). The findings suggested that the integrated cognitive intervention therapy remarkably enhanced cognitive function, ADL and mood in patients with mild to moderate AD.
Yan YJ et al., 2020 [43]	Pilot study	A pilot research was conducted to analyse the effects of Expressive Arts Therapy (EAT) in older adults with mild cognitive impairment. The findings showed that the Expressive Arts Therapy (EAT) program showed significant improvements in general cognitive function, language function, anxiety, depression, and the psychological and social relationship domains of QoL.
Palomares MJ et al., 2021 [44]	Randomised controlled	A pilot study was conducted to test the effectiveness of cognitive rehabilitation programme on ADLs of individuals with Dementia. The study revealed that physical therapy supported ADL cognitive stimulation can have a positive effect, in subjects with major neuro-cognitive disorder or dementia who are institutionalised.
Soontorntanaphol N, 2021 [45]	Assessment study	The author conducted a study on the participation of elderly in music and art activities. The study revealed that the elderly participated in music and art activities by joining in the thinking, planning, acting, and solving problems process. The elderly were benefited both physically and mentally.
da Silva TBL et al., 2021 [46]	Systematic review	A systematic review was conducted to find the psychological and QoL benefits through cognitive interventions in mature and older adults. They found that there was significant positive impact of the cognitive based interventions on life quality, mental well-being of elderly people without dementia.
da Silva Jardim VCF et al., 2021 [47]	Literature review	A review was conducted to understand the contributions of art therapy to promote the health and QoL of older adults. It concluded that the use of art therapy for health promotion in older adults demonstrated benefits in reducing negative factors of an affective, emotional and social nature. A positive effect was noted on the QoL.
Mendes L et al., 2022 [48]	Systemic review	A systemic review was conducted on the impact of cognitive interventions on older adults with or without cognitive decline. A total of 168 studies were selected and different types of cognitive intervention in older adults commonly reported in the literature were reviewed. The findings indicated heterogeneity regarding methods, concepts, and procedures.
González-Ojea MJ et al., 2022 [49]	Experimental study	An experimental study was performed to check if music therapy can improve the QoL of institutionalised elderly people. A total of 52 elderly people living in a nursing home took part in the study. The results showed an enhancement in the physical aspect of QoL and an improved creativity and mass interaction in the participated subjects. Hence, it was concluded that music therapy could enhance and promote health and life quality in the geriatric individuals.
Tulliani N et al., 2022 [50]	Systematic review and meta-analysis	A systematic review and meta-analysis was conducted on the efficacy of cognitive remediation on ADL in individuals with mild cognitive impairment or early-stage dementia. The results of meta-analysis, indicated that cognitive remediation generated better IADL performance (Standard Mean Deviation (SMD): 0.17, 95% CI 0.03-0.31). Therefore, cognitive remediation is effective in improving instrumental ADL performance immediately post-intervention in older adults with mild cognitive impairment and early-stage dementia.
Haradwala S and Vaghela D, 2022 [51]	Experimental study	The author conducted an experimental study to check the effectiveness of cognitive training on ADL in elderly. They concluded significant improvement in ADL and reduction in functional disability in experimental group after a treatment of four weeks.

[Table/Fig-1]: Summary of studies included [13-51].

## DISCUSSION

The comprehensive review has identified several study designs that report and confirm the positive effects of cognitive-based interventions on daily living activities and QoL in the elderly population. The majority of the studies focused on elderly groups with no major medical health conditions, including physical and mental health. The included studies were quite heterogeneous, encompassing different study designs. All the different studies used standardised protocols and reliable and valid outcome scales. In the present review, most of the treatment protocols utilised in the experimental or randomised controlled trials was for four weeks to six months, with most of the follow-ups extending up to six months. One study also had a longer follow-up of upto five years, and the intervention has proven to show a positive impact on cognitive maintenance and improving QoL even five years after the start of the intervention [14]. While most studies focused on the effect of cognitive-focused interventions solely on improving daily living activities or QoL, some studies also confirmed the combined effect of physical exercise and cognitive interventions on daily life functioning [18,29,31]. In addition, a systematic review and meta-analysis of randomised controlled trials also confirms the same [37]. Most of the studies selected in present review have shown beneficial results in daily functioning and life quality in the geriatric population through the implementation of integrated therapies such as art therapy and music therapy. Aspects of cognitive training and music therapy in groups have shown improvement in life quality and ADL in the elderly [27,40]. An Randomised Control Trail (RCT)-based study has also concluded the significant benefit of online cognitive training in improving daily function in older adults [26].

The highlight of present review study was to ascertain the effects of specific domains of rehabilitation, including cognitive therapy and other integrated novel therapies, on the enhancement of ADL and life quality in the geriatric population, which is an important sphere of wellness.

### Limitation(s)

The present review study has a number of limitations, starting with the fact that the data is heterogeneous. Next, there is no standardised technique for the screening of subjects or a universal measure of outcome scales. The selected studies used various treatment protocols, and the effect sizes were rarely reported. Another limitation was that the selection of studies was done by a single reviewer, which may account for the risk of reporting bias.

## CONCLUSION(S)

Cognitive therapy and various integrated intervention therapies for ADL and QoL in the elderly population have been found to be substantially effective. However, the specific types, duration, and frequency of the different integrated interventions require further research and have further scope. The review suggests positive effects of cognitive training programs and other integrated therapies, but it remains unclear somewhere on their retention and long-term effects. Therefore, the cognitive-based therapies, art, and music therapy can be implemented for fostering better results in the overall wellness of the geriatric population in medical policies and systems in the near future.

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