



Review Article

# Effect of Music Therapy on Quality of Life in Geriatric Population: A Systematic Review and Meta-Analysis

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## ABSTRACT

The older population is susceptible to dementia, Alzheimer's and depression. A growing elderly population poses a burden on caregivers and society. If their cognitive and psychological health is maintained, they may not need to depend on others for their needs, thereby reducing the burden on caregivers. This, in turn, may lead to a decrease in the necessity for consulting healthcare providers for psychological health, subsequently reducing the overall cost of healthcare. There are numerous options for improving cognitive and mental health in the elderly, one of which is music therapy (MT). In this systematic review, we aim to demonstrate the efficacy of MT in enhancing psychological health among the geriatric population afflicted with dementia and depression. A systematic search was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines across PubMed, Scopus, ScienceDirect, and Cochrane databases. The inclusion criteria were randomized controlled trials (RCTs) that explored the use of MT in elderly patients with or without depression, dementia, or Alzheimer's. Non-RCTs, retrospective and prospective observational studies, case reports, and case series were excluded. Out of 76 records identified, eight articles were selected for qualitative synthesis and three for meta-analysis. These studies, conducted between 2010 and 2020, involved a total of 605 subjects, with 330 receiving MT and the remainder serving as controls. The interventions varied in terms of music type, duration, and setting, with outcome measures including depression scales, quality of life assessments, and cognitive examinations. The meta-analysis of depression scores indicated a positive effect of MT, though a wide confidence interval warrants caution. The quality assessment revealed varying risks of bias, highlighting the need for further research to confirm the positive role of MT. In conclusion, MT emerges as a promising intervention, but it is accompanied by considerable limitations and heterogeneity among studies. This emphasizes the need for further RCTs that specifically address the identified limitations, including issues related to sample size, control group selection, and potential confounding factors. Conducting more robust research in these areas is crucial to establishing a clearer understanding of the therapeutic benefits of music in the elderly population.

**Keywords:** Depression, Music intervention, Agitation, Dementia, Quality of life

## INTRODUCTION

Dementia<sup>[1-3]</sup> and depression<sup>[4]</sup> are significant causes of non-fatal disease burden globally. It is estimated that depression may be present in 27.5% of the elderly persons staying in community-dwelling<sup>[5]</sup> and in 65% of the elderly persons who are institutionalised.<sup>[6]</sup> It cannot be underestimated that quality of life (QOL) plays a paramount role in defining healthy ageing<sup>[7]</sup>, and the presence of depression can compromise QOL, more so in elderly persons.<sup>[8,9]</sup> It is being emphasised that there is a need for strategies to facilitate healthy ageing, and to achieve this objective, there is a need to have preventive medicine strategies<sup>[10]</sup> that can preserve mental and physical well-being but also can reduce the social, emotional and physiological disabilities.<sup>[11]</sup> Studies have

emphasised the need for alternative non-pharmacological methods to improve the overall QOL and well-being of elderly people, particularly those with cognitive impairment.<sup>[12,13]</sup> Increasingly, the role of music in its various forms and music therapy (MT) has been explored to improve the physical, psychological and physiological functioning of the ageing population.<sup>[3,8,14-19]</sup> Although many studies have shown that MT is effective, other studies have raised concerns about the overall effectiveness of MT over other modalities,<sup>[20]</sup> including modalities such as reading or other group activities to improve the features of dementia.<sup>[15]</sup> In the older population, with or without dementia, depression, and Alzheimer's, MT helps improvement of depression, QOL and cognition in comparison with the older population

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not receiving MT. The present systematic review and meta-analysis try to find out the status, role and scope of MT to improve the QOL in elderly patients, particularly dementia and altered mental functions.

## METHODS

We used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines for conducting the present review.<sup>[21]</sup> A systematic literature search was conducted across PubMed, SCOPUS, Central Cochrane Registry of Controlled Trials (the Cochrane Library) and ScienceDirect databases, using the search terms outlined in Table 1. In addition, the reference lists of included studies were reviewed for potentially relevant studies. Three investigators (SM, SKT and AG) independently screened abstracts, with selected articles undergoing full-text evaluation. Conflicts were resolved through consensus, resulting in a final list of studies. Only randomised controlled trials (RCTs) conducted in the older population and comparing MT were included in this review. Quasi-randomised controlled studies, prospective and retrospective observational studies, case series, case reports, letters, editorials, comments, animal studies and non-English literature studies were excluded from the study. Three investigators independently assessed studies and extracted data using a pre-designed pro forma based on inclusion criteria. The PRISMA flow chart illustrating the study selection process is presented in Figure 1. The details included were study authors, study year, country, sample size in each group, age and gender, inclusion/exclusion criteria, type of interventions, reported outcomes and details of follow-up. Authors were contacted for missing data. Discrepancies were resolved with consensus.

### Statistical analysis

The meta-analysis was conducted using Review Manager (version 5.3, Cochrane Collaboration). A random-effects model was used for the meta-analysis as there was inherent heterogeneity among studies. Forest plots were generated to represent individual study effects and heterogeneity among studies was assessed using the Cochrane Q test and  $I^2$  statistic. A significance level of  $P < 0.10$  or  $I^2 > 50\%$  was considered to suggest substantial heterogeneity. The revised JBI critical appraisal tool was employed to assess the risk of bias in RCTs.<sup>[22]</sup>

## RESULTS

A systematic search was conducted with the predefined search criteria, as mentioned in Table 1, which yielded 76 records. Six articles were removed due to duplication. After screening the articles based on their titles, 54 records were excluded from the study. Sixteen full-text articles were studied for eligibility, resulting in eight articles included for qualitative synthesis. The excluded eight articles, along with the reasons for their

**Table 1:** Details of search strategy.

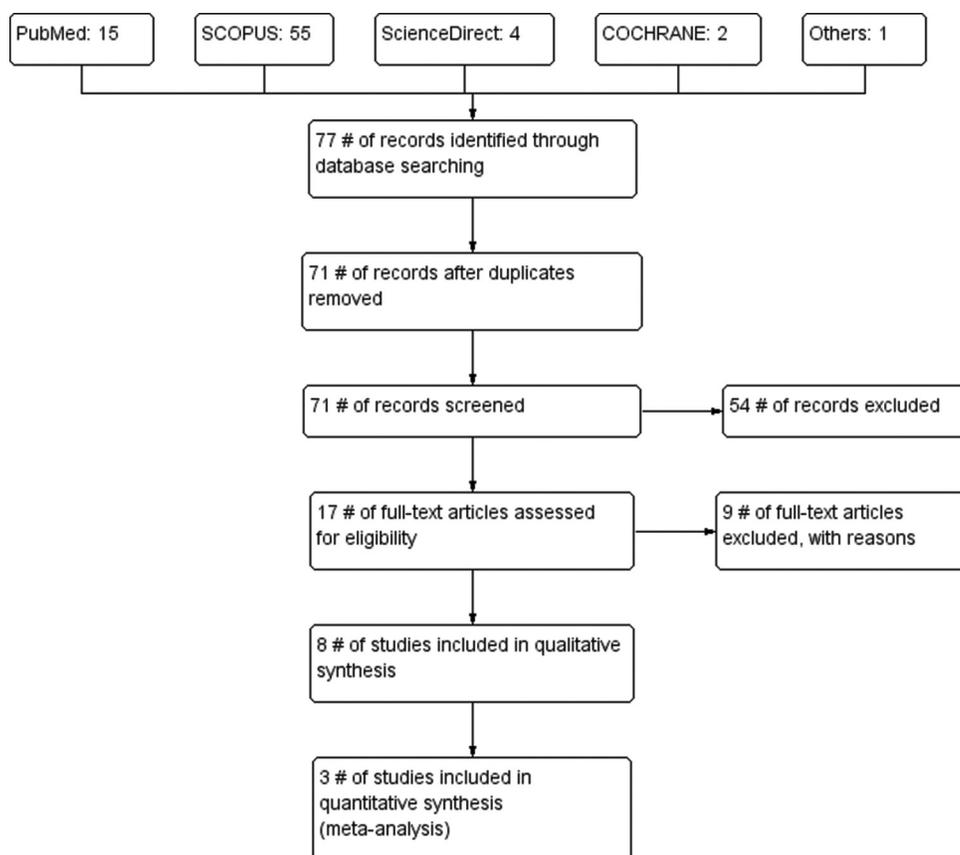
Database	Search details
COCHRANE	2 Cochrane reviews matching geriatric quality of life music in title abstract keyword
PubMed	((‘geriatric’ [All Fields] OR ‘geriatrics’ [MeSH Terms] OR ‘geriatrics’ [All Fields]) AND (‘quality of life’ [MeSH Terms] OR (‘quality’ [All Fields] AND ‘life’ [All Fields]) OR ‘quality of life’ [All Fields]) AND (‘music’ [MeSH Terms] OR ‘music’ [All Fields] OR ‘musics’ [All Fields] OR ‘musical’ [All Fields] OR ‘musicality’ [All Fields] OR ‘musically’ [All Fields] OR ‘musicals’ [All Fields] OR ‘musics’ [All Fields])) AND ((randomisedcontrolledtrial [Filter]) AND (1000/1/1:2024/1/3 [pdat]))
ScienceDirect	Title, abstract, keywords: geriatric quality of life music
SCOPUS	TITLE-ABS-KEY (geriatric AND quality AND of AND life AND music) AND (LIMIT-TO [DOCTYPE, ‘ar’])

exclusion, are listed in Table 2.<sup>[23-30]</sup> The characteristics of the included articles for qualitative synthesis are detailed in Table 3.

### Study characteristics

Among these eight articles, two are from Singapore, two from Japan and one each from Australia, Malaysia, France and Italy. The article reported age ranges ranging from 55 to 95 years. The total number of subjects studied in all these articles combined is 605, with 330 receiving MT, while the remaining served as controls. Three of these studies employed crossover designs, where controls were initially given MT in the second phase. Among the control interventions, one article utilised painting, and another used reading.

The main inclusion criteria in these studies were dementia ( $n = 4$ ), depression ( $n = 4$ ), Alzheimer’s ( $n = 2$ ) and no clear mention of dementia/depression ( $n = 3$ ). The exclusion criteria used included patients who were not able to hear, read and write, those with comorbidities, individuals unable to walk, patients on palliative care and cases with no clear mention of exclusion criteria ( $n = 3$ ). The interventions varied across the studies, encompassing differences in the duration of intervention, the number of sessions per week, the nature of the music (prerecorded or live) and the setting (at home or in an MT centre). Two studies employed 1-h sessions, three studies utilised 30-min sessions, two studies implemented 40–50-min sessions and one study mentioned 2-h/week sessions. In addition, one study incorporated some form of physical exercise along with MT. Regarding the type of music used, three studies employed prerecorded music, while three studies involved a music therapist and two studies involved musicians.



**Figure 1:** Preferred Reporting Items for Systematic Reviews and Meta-Analyses diagram. #: number

**Table 2:** Characteristics of excluded studies.

Study author (Year)	Reason for exclusion
Bro <i>et al.</i> , 2019 <sup>[23]</sup>	Lymphoma, not on dementia
Choi <i>et al.</i> , 2009 <sup>[3]</sup>	Not a randomised controlled trial
Kiper <i>et al.</i> , 2022 <sup>[24]</sup>	Virtual reality box, no music
Liao <i>et al.</i> , 2018 <sup>[25]</sup>	Further updated analysis is available <sup>[17]</sup>
Palumbo <i>et al.</i> , 2022 <sup>[26]</sup>	Post-stroke, not geriatric alone
Pohl <i>et al.</i> , 2020 <sup>[27]</sup>	Parkinsons disease
Prieto-Prieto <i>et al.</i> , 2022 <sup>[28]</sup>	Exercise not on music
Raglio <i>et al.</i> , 2016 <sup>[29]</sup>	Language in stroke, not on dementia
Villaverde Gutiérrez <i>et al.</i> , 2012 <sup>[30]</sup>	Exercise not on music

### Results of individual studies

The various outcomes were measured using different scales across these studies: Geriatric depression scale (GDS) ( $n = 4$ ), Dementia QOL (DQOL), Mini-mental state exam (MMSE); in French: Evaluation Instantanée du Bien-Être (EVIBE); Numeric rating scale (NRS), Philadelphia geriatric centre; European quality of life dimensions; Pittsburgh sleep quality index and Lubben social network scale (LSNS). MT was found to be helpful in five

studies. One study showed no significant effect on depression scales, while another study demonstrated improvement in oral, immunological and physical health but not in functional mobility. Yet, another study indicated no improvement in QOL. Due to the common outcome measure of GDS across four studies, a meta-analysis was feasible and conducted as follows.

### Risk of bias and quality assessment

According to the JBI tool employed for quality assessment, five studies demonstrated a low risk of bias<sup>[15-17,19,20]</sup>, while three studies exhibited a moderate risk of bias.<sup>[8,13,18]</sup> Detailed information is provided in Table 4.

### Meta-analysis

In the meta-analysis using a random-effects model with an inverse variance method for continuous data, we compared the GDS scores at follow-up between MT and non-MT groups for three studies.<sup>[15,16,18]</sup> The overall effect estimate was 0.75, standard error of 1.46 and a confidence interval (CI) -1.46--0.04, suggesting a positive effect in favour of MT. However, in view of the wide CI, the results need to be interpreted with caution [Figure 2]. The Z statistic was found to be 0.3 ( $P = 0.04$ ), suggesting that the overall effect is different from zero; however, the modest Z statistic highlights the need for further

Table 3: Characteristics of included studies.

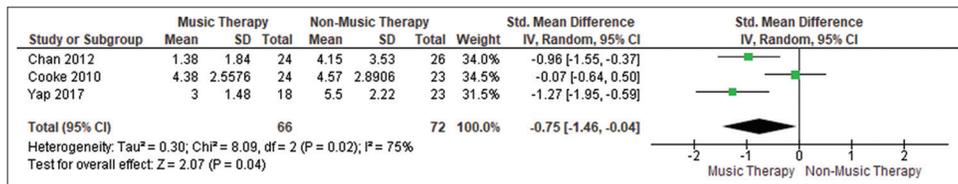
Study	country	Age (mean)	Sex M/F	subjects	Inclusion	Exclusion	intervention	Outcome variables and Follow up	Remarks
Chan et al., 2012 <sup>[18]</sup>	Singapore	range- 55–75	MT- 9/15; C-9/17	MT-24; C-26	Older people >55 year, able to communicate and not hospitalised	No consent, inability to hear, read and write	30 min music (pre-recorded) at home per week for 8 weeks; controls- undisturbed 30 min	GDS-15 at 8 weeks	MT can help in reducing depression in older people
Cooke et al., 2010 <sup>[15]</sup>	Australia	range-65–95	14/33	24/23	Early to mid-stage dementia (MMSE-12–24); Alz; documented agitation and aggression	Not clear	40 min sessions (musician+pre-recorded) 3 days/week for 8 weeks control- reading	DQOL, GDS, MMSE at 8 weeks	Music and reading can improve self-esteem and depression in some older people with dementia.
Liao et al., 2019 <sup>[17]</sup>	Malaysia	MT-71.72±7.331; c-71.87±8.002	MT-19/38; c-24/31	MT-55; C-57	Selected communities, GDS score of 11–25 (mild-to-mod depression)	Comorbidities, physical impediments	Tai Chi exercise+music (recorded traditional) 50 min session 3 times/week for 3 months	QOL-physical domain, psychological, social, environmental	Improves QOL among community-dwelling older persons with mild-to-moderate depression
Murabayashi et al., 2019 <sup>[19]</sup>	Japan	MT- 80.9±5.6, C-81.7±5.5	MT- 1/47, C-5/41	MT-48; C-46	Dementia; Depression, pre stage care need; Frailty	Not clear	Session of 45–50 min (with MTP), once in a week for 12 weeks	Cognitive- VTE, YKSST; Physical – TUG; psychological- GDS15, GHQ12, IADL, LSA	MT with therapist is useful
Pongan et al., 2020 <sup>[13]</sup>	France	MT-78.8±7.43; paint-80.2±5.71	MT-8/23; paint-12/16	MT-31; P-28	Mild Alz with MMSE>20, chronic pain moderate to severe	Not clear	2 h session in 12 weeks. (by professional choir); painting with professional	EVIBE, NRS at 12 weeks	PI and SI provide immediate benefit on patients' wellbeing
Raglio et al., 2015 <sup>[20]</sup>	Italy	MT-81.0±7.6, LtM- 81.7±7.8, C-82.4±6.8	MT- 11/29, LtM-8/32, C-7/33	MT-31; LTM-32; C-35	Dementia score -1-4, MMS <18, NPIS - <18; Depression	CVS, RS, GI, previous therapy with MT	30 min sessions, twice a week for 10 weeks by MTP; LTM with prerecorded playlist)	NPI score; Cornell - depression; cornell- brown QOL	MT and LTM did not have significant effect
Shimizu et al., 2013 <sup>[8]</sup>	Japan	MMT-73.97±5.59; C-		MT-58; C-33	elderly not habitual for exercise	unable to walk, attendance rate<60%	1 h session per week for 10 weeks	PGC morale scale, PEM, Health behaviour, Health status- self rated	rhythmic MMT intervention, significantly improved local (oral cavity) immunological function and physical function, except for functional mobility, in elderly women
Yap et al., 2017 <sup>[16]</sup>	Singapore	74.65±6.40	2/29	MT-27; C-27	>65-year-old, no mention on dementia or delirium	individuals on palliative care and bed bound	1 h session once a week for 10 weeks (Rhythm centred music making by instructors with instruments)	EQ5D, GDS, PSQI, LSNS	No significant difference in QOL

GDS: Geriatric depression scale, DQOL: Dementia quality of life, MMSE: Mini mental state exam; EVIBE (in French): Evaluation Instantanexe du Bien-Etre, NRS: Numeric rating scale, PGC: Philadelphia geriatric centre, EQ5D: European quality of life dimensions, PSQI: Pittsburgh sleep quality index, LSNS: Lubben social network scale, TUG: Timed up and go, GHQ-12: General health questionnaire, MT: Music therapy, LTM: Listening to music, MTP: Music therapist, NPI: Neuropsychiatric inventory, QOL: Quality of life; SI: Singing Intervention; VTE: Verbal Fluency Test; YKSST: Yamaguchi Kanji Symbol Substitution Test; PEM: Protein Energy Malnutrition; MMT: Movement music therapy; MMSE: Mental State Examination; CVS: Cardiovascular system

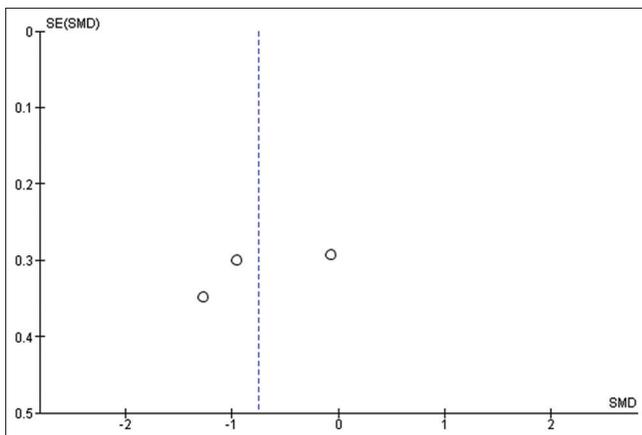
**Table 4:** JBI critical appraisal checklist for RCT studies.

Study ID	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Item 11	Item 12	Item 13
Chan <i>et al.</i> , 2012 <sup>[18]</sup>	Yes	Unclear	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Cooke <i>et al.</i> , 2010 <sup>[15]</sup>	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Liao <i>et al.</i> , 2019 <sup>[17]</sup>	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Murabayashi <i>et al.</i> , 2019 <sup>[19]</sup>	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pongan <i>et al.</i> , 2020 <sup>[13]</sup>	Unclear	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Unclear	Yes	Yes	Yes
Raglio <i>et al.</i> , 2015 <sup>[20]</sup>	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Shimizu <i>et al.</i> , 2013 <sup>[8]</sup>	Unclear	Unclear	Yes	No	No	Yes	Yes	Yes	Yes	Unclear	Yes	Yes	Unclear
Yap <i>et al.</i> , 2017 <sup>[16]</sup>	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes

RCT: Randomised controlled trial



**Figure 2:** Forest plot. SD: Standard deviation, CI: Confidence interval



**Figure 3:** Funnel plot. SE(SMD): Standard error of the standardized mean difference

studies to confirm the positive role of MT. There was significant heterogeneity among the studies on the Q statistic, and the I<sup>2</sup> value of 75% further highlights potential differences in the included studies [Figure 3].

## DISCUSSION

There are numerous cultures and traditions worldwide; some lack a written language, but none are without music or dance.

Music and dance serve as a universal language of expression. It is plausible that our ancestors recognised the significance of MT for well-being, self-esteem and the prevention of depression. In our review, at least two studies emphasise traditional methods of music and dance. While there is limited evidence for the efficacy of MT in relieving pain in conditions such as chronic obstructive pulmonary disorders, Alzheimer’s, multiple sclerosis and Parkinson’s disease, the exact mechanism for how MT improves depression in the elderly remains unclear. Some studies suggest a physiological response through mood alteration, thereby enhancing overall health. The emotional response may be attributed to the involvement of the limbic system.<sup>[18]</sup>

Yap *et al.*<sup>[16]</sup> conducted a crossover RCT involving elderly participants without dementia. The MT intervention included the use of musical instruments under the guidance of experienced instructors, with each session lasting 1 h. A total of over ten sessions were conducted across 11 weeks. The study observed a non-significant reduction in the GDS score by 0.479 (95% CI: -0.329, 1.287) and an improvement in the LSNS by 1.125 (95% CI: -1.134, 3.384). Despite the lack of statistical significance in the scores, the authors noted that the intervention was well-received by the participants. Chan *et al.*<sup>[18]</sup> utilised a 30-minute pre-recorded music at home for older individuals, the majority of whom were women (62% not habitually listening to music [LtM]). Many participants

had chronic illnesses such as hypertension and diabetes. The variation in depression levels, assessed by GDS scores, was notably different, mainly from the 4<sup>th</sup> to the 8<sup>th</sup> week, with a significant  $P = 0.0016$  observed in the 8<sup>th</sup> week. The significant reduction in depression over the 8 weeks was confirmed by an F-value of 7.05 with  $P = 0.016$ .

Liao *et al.*, in 2019<sup>[17]</sup> utilised traditional Tai Chi with music in 50-minute sessions. The study included individuals with mild-to-moderate depression, characterised by GDS scores of 11–25. The attendance rates were notably high at 98%. The music group exhibited substantial improvements in QOL at 3 months, evident in the physical, psychological, social and environmental domains (F-values of 50.66, 32.97, 56.85 and 27.75, respectively, with  $P < 0.001$ ). Cooke *et al.*<sup>[15]</sup> employed MT in patients with early to mid-stage dementia, as indicated by MMSE scores ranging from 12 to 24, in a crossover study. The sessions, lasting 40 min each, involved collaboration with a musician and utilised pre-recorded music. The study predominantly featured women (70%), many of whom were widowed. Among these participants, 30% had depression. Significant differences in midpoint QOL scores were observed between the music and control (reading) groups ( $F = 6.672$ ,  $P < 0.05$ ). Initially, the control group reported higher feelings of belonging (3.61) compared to the MT group (3.17). However, after crossover, the control group's scores decreased from 3.61 to 3.46, while the music group showed increased scores from 3.17 to 3.57. Regarding depression scores from the GDS, a significant decrease over time was noted ( $F [2, 22] = 8.129$ ,  $P < 0.01$ ).

Murabayashi *et al.*<sup>[19]</sup> conducted a crossover RCT in 2019 involving older individuals with dementia, depression and frailty. The sessions, lasting 45–50 min, were conducted by a music therapist. Out of the 94 participants, the majority were female (93%). The study found that the MT-first group exhibited significant improvements compared to the waiting-first group in terms of timed up and go (TUG), GDS-15 and general health questionnaire (GHQ-12) scores, with effect magnitudes of  $-0.64$ ,  $-0.75$  and  $-0.95$ , respectively. Following the crossover, the clinical global impressions of improvement responder rate were significantly better in the MT group than the waiting group, with  $P < 0.05$ . The study acknowledged limitations, including a small sample size and the exclusion of at least 20 participants due to poor attendance. The female dominance in the study raised concerns about generalizability. Despite the observed improvements in TUG, GDS-15 and GHQ-12 scores with MT, the study noted that cognitive function did not show any significant effects. The authors emphasised the necessity for further research involving specific types of musical activities to better understand the potential benefits of MT in this population.

Raglio *et al.*<sup>[20]</sup> conducted a study using MT in older patients with dementia (MMS  $< 18$  and neuropsychiatric inventory [NPIS]  $< 18$ ) and depression (Cornell scale for depression in

dementia [CSDD] score 1–4). The intervention consisted of 30-minute sessions twice a week for 10 weeks, facilitated by a music therapist using a prerecorded playlist. The study involved three groups: MT, LtM and controls. Results demonstrated significant improvements in behavioural symptoms and depression (assessed by the CSDD score) and QOL (Cornell-brown scale - score) over time. However, these improvements were not specifically attributed to any particular intervention. The reduction in neuropsychiatric inventory (NPI) global score was statistically significant ( $P = 0.001$ ) with a decrease of 28% in MT, 12% in LtM and 21% in the control group. *Post hoc* analysis revealed reductions in specific NPI subclasses, including delusion (LtM: 37%, MT: 35% and Controls: 11%) and disinhibition (LtM:  $-40\%$ , MT:  $-44\%$ , Controls:  $-61\%$ ). In the MT group, a positive trend, although not statistically significant, was observed for behaviour-related scores. The study acknowledged significant dropout rates and highlighted that the control group received standard care, potentially impacting the results.

Pongan *et al.*<sup>[13]</sup> explored the effectiveness of MT in patients with mild Alzheimer's (MMSE  $> 20$ ) and chronic pain, comparing it to a control group engaging in painting sessions with professional assistance. Both MT and painting groups showed non-significant changes in NRS scores (MT: 2.68–2.39,  $F = 1.37$ ,  $P = 0.25$ ; Painting: 3.54–2.88,  $F = 2.27$ ,  $P = 0.14$ ). Significant improvements in EVIBE scores were observed in both groups (MT: 3.17–4.30, Painting: 3.44–3.90), with MT achieving significance ( $F = 4.10$ ,  $P = 0.05$ ). The study acknowledges limitations, including variability in pain scores which led to non-significant results in NRS scores and the absence of a proper control group, impacting the assessment of MT and painting effectiveness.

Shimizu *et al.*<sup>[8]</sup> conducted a study employing MT in elderly individuals who were not habitual exercisers. The intervention utilised the Naruko clapper, a traditional musical instrument in the community, to create rhythmic movements accompanied by music. The participants attended 1-h sessions of MT per week. Results indicated that MT had positive effects on both psychological and physical function aspects, especially in younger elderly patients whom they considered as  $< 75$  years old. Notably, the intervention demonstrated a positive influence on the secretion of SIgA, indicating an immunological function (REL-IAFT:  $P = 0.004$ ,  $r^2 = 0.181$ ; REL-BEF:  $P = 0.008$ ,  $r^2 = 0.200$ ). However, no significant differences were observed in physiological indices. The study highlighted the significant impact of age on physiological functioning. It is important to note that the study primarily included women, which represents a limitation.

### Limitations

There is a limitation of the studies, which was the inclusion of some form of physical exercise alongside music, making it challenging to isolate the impact of music alone on the observed results. This factor complicates the interpretation of the findings

specifically attributed to the music component.<sup>[17]</sup> Chan *et al.*<sup>[18]</sup> demonstrated a positive aspect with 100% participant retention. However, it is constrained by sample selection bias through snowballing using social networks. No participant was blinded, and there was no control over the frequency of at-home music listening. There is a need for further RCTs with consistent treatment across groups, except for MT and exploration of different timing for sessions<sup>[18,20]</sup> focusing on grouping participants based on physical function rather than age for a more comprehensive understanding of the intervention's effects<sup>[8]</sup> including collaboration between a psychologist and a research nurse.<sup>[18]</sup> The studies lack a proper control group without any intervention, as the control group in this study consisted of readers, and the reading group also showed significant improvement in depression scores.<sup>[15]</sup> Yap *et al.*<sup>[16]</sup> had that the primary limitation of the study is the small sample size, consisting of only 31 participants; also, the authors underscored the need for further RCTs without a crossover design, citing potential challenges in assessing a washout period due to the possibility of a learned effect from the therapy, unlike in drug studies.

## CONCLUSION

The results of the studies in our review exhibit diversity, with studies employing different assessment scores such as GDS, DQOL and MMSE. A meta-analysis of GDS scores from three studies suggests a positive effect in favour of MT, although caution is warranted due to the wide CI. While MT appears promising in alleviating depression and enhancing physical well-being in the elderly, the heterogeneity and limitations across the studies necessitate further well-designed research to establish its efficacy and understand the specific mechanisms underlying its positive effects. Future studies should address issues such as sample size, control group selection and potential confounding factors to provide more robust evidence for the therapeutic benefits of music in this population.

## Ethical approval

The Institutional Review Board approval is not required.

## Declaration of patient consent

Patient's consent was not required as there are no patients in this study.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

## Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the

writing or editing of the manuscript and no images were manipulated using AI.

## REFERENCES

1. Goodall D, Eters L. The Therapeutic Use of Music on Agitated Behavior in Those with Dementia. *Holist Nurs Pract* 2005;19:258-62.
2. Sung HC, Chang AM. Use of Preferred Music to Decrease Agitated Behaviours in Older People with Dementia: A Review of the Literature. *J Clin Nurs* 2005;14:1133-40.
3. Choi AN, Lee MS, Cheong KJ, Lee JS. Effects of Group Music Intervention on Behavioral and Psychological Symptoms in Patients with Dementia: A Pilot-controlled Trial. *Int J Neurosci* 2009;119:471-81.
4. Wilson Z. Out of the Shadows-making Mental Health a Global Development Priority. *Mental Health Matters* 2016;3:1-4.
5. Laborde-Lahoz P, El-Gabalawy R, Kinley J, Kirwin PD, Sareen J, Pietrzak RH. Subsyndromal Depression among Older Adults in the USA: Prevalence, Comorbidity, and Risk for New-onset Psychiatric Disorders in Late Life. *Int J Geriatr Psychiatry* 2015;30:677-85.
6. Kowalska J, Rymaszewska J, Szczepańska-Gieracha J. Occurrence of Cognitive Impairment and Depressive Symptoms among the Elderly in a Nursing Home Facility. *Adv Clin Exp Med* 2013;22:111-7.
7. Li CI, Lin CH, Lin WY, Liu CS, Chang CK, Meng NH, *et al.* Successful Aging Defined by Health-related Quality of Life and Its Determinants in Community-dwelling Elders. *BMC Public Health* 2014;14:1013.
8. Shimizu N, Umemura T, Hirai T, Tamura T, Sato K, Kusaka Y. Effects of Movement Music Therapy with the Naruko Clapper on Psychological, Physical and Physiological Indices among Elderly Females: A Randomized Controlled Trial. *Gerontology* 2013;59:355-67.
9. Lyon ME, Jacobs S, Briggs L, Cheng YI, Wang J. A Longitudinal, Randomized, Controlled Trial of Advance Care Planning for Teens with Cancer: Anxiety, Depression, Quality of Life, Advance Directives, Spirituality. *J Adolesc Health* 2014;54:710-7.
10. Kaerberlein M, Rabinovitch PS, Martin GM. Healthy Aging: The Ultimate Preventative Medicine. *Science* 2015;350:1191-3.
11. Kneafsey R. The Therapeutic Use of Music in a Care of the Elderly Setting: A Literature Review. *J Clin Nurs* 1997;6:341-6.
12. Dhippayom T, Saenook T, Promkhatja N, Teaktong T, Chaiyakunapruk N, Devine B. Comparative Effects of Music Interventions on Depression in Older Adults: A Systematic Review and Network Meta-analysis. *EClinicalMedicine* 2022;50:101509.
13. Pongan E, Delphin-Combe F, Krolak-Salmon P, Leveque Y, Tillmann B, Bachelet R, *et al.* Immediate Benefit of Art on Pain and Well-Being in Community-Dwelling Patients with Mild Alzheimer's. *Am J Alzheimers Dis Other Demen* 2020;35:1-7, DOI:1533317519859202.
14. Munro S, Mount B. Music Therapy in Palliative Care. *Can Med Assoc J* 1978;119:1029-34.
15. Cooke M, Moyle W, Shum D, Harrison S, Murfield J. A Randomized Controlled Trial Exploring the Effect of Music on Quality of Life and Depression in Older People with Dementia. *J Health Psychol* 2010;15:765-76.
16. Yap AF, Kwan YH, Tan CS, Ibrahim S, Ang SB. Rhythm-centred Music Making in Community Living Elderly: A Randomized Pilot Study. *BMC Complement Altern Med* 2017;17:311.
17. Liao SJ, Chong MC, Tan MP, Chua YP. Tai Chi with Music Improves Quality of Life among Community-dwelling Older Persons with Mild to Moderate Depressive Symptoms: A Cluster Randomized Controlled Trial. *Geriatr Nurs* 2019;40:154-9.
18. Chan ME, Wong ZY, Onishi H, Thayala NV. Effects of Music on Depression in Older People: A Randomised Controlled Trial. *J Clin Nurs* 2012;21:776-83.
19. Murabayashi N, Akahoshi T, Ishimine R, Saji N, Takeda C, Nakayama H, *et al.* Effects of Music Therapy in Frail Elderlies: Controlled Crossover Study. *Dement Geriatr Cogn Dis Extra* 2019;9:87-99.
20. Raglio A, Bellandi D, Baiardi P, Gianotti M, Ubezio MC, Zancacchi E, *et al.* Effect of Active Music Therapy and Individualized Listening to Music on Dementia: A Multicenter Randomized Controlled Trial. *J Am Geriatr Soc* 2015;63:1534-9.
21. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, *et al.* The PRISMA 2020 Statement: An Updated Guideline for Reporting Systematic Reviews. *BMJ* 2021;372:n71.
22. Barker TH, Stone JC, Sears K, Klugar M, Tufanaru C, Leonardi-Bee J, *et al.* The Revised JBI Critical Appraisal Tool for the Assessment of Risk of Bias

- for Randomized Controlled Trials. *JB I Evid Synth* 2023;21:494-506.
23. Bro ML, Johansen C, Vuust P, Enggaard L, Himmelstrup B, Mourits-Andersen T, *et al.* Effects of Live Music during Chemotherapy in Lymphoma Patients: A Randomized, Controlled, Multi-center Trial. *Support Care Cancer* 2019;27:3887-96.
  24. Kiper P, Przysiężna E, Cieślak B, Broniec-Siekaniec K, Kucińska A, Szczygieł J, *et al.* Effects of Immersive Virtual Therapy as a Method Supporting Recovery of Depressive Symptoms in Post-Stroke Rehabilitation: Randomized Controlled Trial. *Clin Interv Aging* 2022;17:1673-85.
  25. Liao SJ, Tan MP, Chong MC, Chua YP. The Impact of Combined Music and Tai Chi on Depressive Symptoms Among Community-Dwelling Older Persons: A Cluster Randomized Controlled Trial. *Issues Ment Health Nurs* 2018;39:398-402.
  26. Palumbo A, Aluru V, Battaglia J, Geller D, Turry A, Ross M, *et al.* Music Upper Limb Therapy-Integrated Provides a Feasible Enriched Environment and Reduces Post-stroke Depression: A Pilot Randomized Controlled Trial. *Am J Phys Med Rehabil* 2022;101:937-46.
  27. Pohl P, Wressle E, Lundin F, Enthoven P, Dizdar N. Group-based Music Intervention in Parkinson's Disease - findings from a Mixed-methods Study. *Clin Rehabil* 2020;34:533-44.
  28. Prieto-Prieto J, Madruga M, Adsuar JC, González-Guerrero JL, Gusi N. Effects of a Home-Based Exercise Program on Health-Related Quality of Life and Physical Fitness in Dementia Caregivers: A Randomized Controlled Trial. *Int J Environ Res Public Health* 2022;19:9319.
  29. Raglio A, Oasi O, Gianotti M, Rossi A, Goulene K, Stramba-Badiale M. Improvement of Spontaneous Language in Stroke Patients with Chronic Aphasia Treated with Music Therapy: A Randomized Controlled Trial. *Int J Neurosci* 2016;126:235-42.
  30. Villaverde Gutiérrez C, Torres Luque G, Ábalos Medina GM, Argente del Castillo MJ, Guisado IM, Guisado Barrilao R, *et al.* Influence of Exercise on Mood in Postmenopausal Women. *J Clin Nurs* 2012;21:923-8.

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