Vokatek: Journal of Research and Community Service
E-ISSN: 2986-0105 P-ISSN : 2985-8402
Vol. 4, No. 3, December 2026
https://journal.diginus.id/VOKATEK/index

Changes in Anxiety Following Spiritual Music Intervention Among Older Adults in Residential Care

Lisa Louwria Lasera[1], Mawar Gloria Tarigan[2], Julenda Sebayang[3], Inda Meirani H Sinaga[3], Novrina Situmorang[4]

[1]*Undergraduate Medical Education Program, Faculty of Medicine, Universitas Methodist Indonesia, Medan, Indonesia*
[2]*Department of Psychiatry, Faculty of Medicine, Universitas Methodist Indonesia, Medan, Indonesia*
[3]*Department of Pharmacology, Faculty of Medicine, Universitas Methodist Indonesia, Medan, Indonesia*
[4]*Department of Anatomy, Faculty of Medicine, Universitas Methodist Indonesia, Medan, Indonesia*

Corresponding e-mail: lisalouwrial@gmail.com

ARTICLE INFO

Keywords:
anxiety; older adults; residential care; spiritual music; pretest–posttest.

Article History

Received: Sept 15, 2026
Revised: Oct 30. 2026
Accepted: Nov 20, 2026

ABSTRACT

Anxiety can compromise psychological well-being in older adults living in residential care. Music-based interventions offer a potential nonpharmacological approach to symptom management. To examine changes in anxiety following a spiritual music intervention among residents of Karya Kasih Nursing Home. A one-group pretest–posttest study involved 69 purposively selected residents aged 60 years or older. Participants received nine 30-minute sessions over three weeks. Anxiety was assessed with the Hamilton Anxiety Rating Scale (HARS), and paired scores were analyzed using the Wilcoxon signed-rank test. Results: Mean HARS scores decreased from 15.26 to 13.01, a reduction of 2.25 points ($Z = -3.814$, $p < 0.001$). Scores decreased in 36 participants, increased in nine, and remained unchanged in 24. Anxiety scores declined following the intervention; however, the uncontrolled design precludes attribution of the change solely to spiritual music. Controlled studies are needed to determine clinical benefit and persistence.

This is an open access article under the CC BY-SA license

To cite this article: Lasera, L. L., Tarigan, M. G., Sebayang, J., Sinaga, I. M. H., & Situmorang, N. (2026). Changes in Anxiety Following Spiritual Music Intervention Among Older Adults in Residential Care. *Vokatek: Journal of Research and Community Service, 4*(3), 186-195. Doi. 10.61255/vokatek.v4i3.2762

INTRODUCTION

Anxiety in later life is a clinical concern that cannot be reduced to a normal consequence of aging. Worry, fear, restlessness, sleep disturbances, and bodily symptoms can interfere with everyday functioning, particularly when physical illness and changes in social roles coexist. A recent international synthesis identified substantial variation in anxiety symptom prevalence among older adults and highlighted associations with female sex, physical comorbidity, and limited social support (Shafiee et al., 2025). In residential care, the transition to an institutional environment may introduce additional challenges related to autonomy and familiar routines. The importance of social contact, relationships, and coping within nursing homes is also emphasized in recent research on loneliness (van de Kolk et al., 2026). These considerations support a care approach that attends to emotional distress alongside physical health.

Residential care facilities provide a setting in which nonpharmacological interventions can be incorporated into daily activities. A review of anxiety treatments in long-term care found encouraging evidence for selected nonpharmacological approaches, including music, although the available comparative evidence was heterogeneous (Atchison et al., 2022). Psychosocial interventions for loneliness and isolation likewise encompass several distinct approaches rather than a single universally effective strategy (Hoang et al., 2022). Psychological treatment research in dementia and mild cognitive impairment further illustrates the need to select interventions and outcome measures appropriate to residents' capacities (Orgeta et al., 2022). The practical question

is not simply whether a pleasurable activity can be offered, but whether a structured intervention is accompanied by measurable change in a specified symptom. This distinction is particularly relevant to older adults who may require ongoing support in a nursing home.

Music is an accessible medium for emotional engagement, and its use in health care ranges from self-directed listening to structured treatment delivered by a trained music therapist. Controlled studies synthesized by Harney et al. (2023) support the potential of listening to music to alleviate anxiety, while a broader analysis of therapist-delivered interventions similarly identified favorable psychological outcomes (de Witte et al., 2025). Research on stress reduction has also identified possible psychological and physiological benefits of music therapy (de Witte et al., 2022). However, an experimental review of music listening during stress recovery found evidence that was less consistent across outcomes and methods (Adiasto et al., 2022). Music engagement during stressful circumstances has been examined through listening, singing, playing, and other activities, each of which may involve different processes (Zhang et al., 2025). Accordingly, the term spiritual music intervention is used here to describe the scheduled exposure reported in this study without presuming that it constituted professional music therapy.

Spiritual music adds a potential source of meaning to the acoustic experience of rhythm and melody. For listeners who identify with its religious content, familiar lyrics may provide a sense of continuity, reassurance, or hope during periods of emotional distress. Observational research has linked religiosity and spirituality with several indicators of mental well-being in older adults, including lower anxiety and depressive symptoms (Coelho-Júnior et al., 2022). A mixed-methods synthesis on chronic illness also describes spiritual connection, meaning, and social support as possible resources for resilience (Abu et al., 2026). In Indonesia, Hitiyaut et al. (2022) examined Christian spiritual music and anxiety among older residents in a social care setting, providing a particularly relevant local comparison. These findings justify examining spiritually oriented music in residential care, but they do not establish that religious content benefits every listener or that it has an independent effect beyond the music itself.

Existing research on music interventions in older populations offers promising but nonuniform findings. Jang and Kunde (2021) identified diverse musical activities used to address emotional needs and noted shortcomings in the description of cultural context. An evidence map by Ma and Ma (2023) identified favorable and inconclusive findings across several health outcomes, illustrating the breadth of the evidence rather than establishing uniform efficacy. More recently, Akhtar and Buja (2026) reviewed passive listening in older adults and described potential benefits for emotional and social well-being across different study designs. In nursing homes, a trial involving residents with hypertension directly examined anxiety alongside cardiovascular measures (Lorber & Divjak, 2022), whereas a pilot study combined music and movement and assessed a broader set of psychosocial outcomes (De Nys et al., 2024). Such differences in intervention content, target population, and outcome selection limit the direct transfer of findings to a spiritual music program.

The evidence concerning residents with dementia is similarly nuanced. A meta-analysis by Ting et al. (2023) reported favorable pooled anxiety outcomes, and a quasi-experimental study by Feng et al. (2024) found improvements following a program that combined active and passive music activities. Other syntheses have described variable responses or benefits concentrated in a subset of trials (Mei et al., 2025; Salihu et al., 2024). In contrast, an updated Cochrane review found uncertain evidence for anxiety outcomes when music-based interventions were compared with usual care or other activities (van der Steen et al., 2025). A transdiagnostic review of music-based treatment in psychiatry also underscores the importance of distinguishing types of intervention and the strength of the evidence (Lassner et al., 2025). The resulting research gap concerns the contextual applicability of a specified spiritual music schedule to older residents with anxiety, including whether average symptom change is accompanied by consistent improvement across individuals.

This study therefore examined anxiety before and after a three-week spiritual music intervention at Karya Kasih Nursing Home in Medan, Indonesia. The intervention comprised nine sessions, each lasting 30 minutes, and the Hamilton Anxiety Rating Scale (HARS) provided a consistent measure at both assessment points. The analysis was designed to describe the direction

and magnitude of observed change within the participating group rather than to establish an isolated treatment effect. In addition to mean scores, the study considered severity distributions and the direction of individual paired changes. Its contribution is context-specific evidence about a defined intervention schedule and the heterogeneity of anxiety responses among residents in one Indonesian nursing home. These observations may inform the design of more rigorous controlled evaluations and the cautious development of complementary activities in residential geriatric care.

RESEARCH METHODS

Study design and setting

This quantitative study used a pre-experimental one-group pretest–posttest design to examine within-participant changes in anxiety following a spiritual music intervention. The study was conducted from October 5 to 24, 2026, at Karya Kasih Nursing Home (Graha Residen Senior), Jalan Mongonsidi No. 69, Polonia, Medan Polonia, Medan, North Sumatra, Indonesia, after ethical approval was obtained from the Health Research Ethics Committee of the Faculty of Medicine, Universitas Methodist Indonesia. The design enabled comparison of paired anxiety scores at two time points, but did not include an untreated comparison group.

Population and sample

The study population comprised older adults residing at Karya Kasih Nursing Home. A purposive sampling approach yielded 69 participants. Eligibility criteria included age of at least 60 years, willingness to participate and provide signed informed consent, ability to communicate, and anxiety according to the baseline HARS assessment. Residents with severe hearing impairment or severe cognitive impairment, as well as those who did not complete the intervention sessions, were excluded.

Anxiety assessment

Anxiety was assessed using the Hamilton Anxiety Rating Scale (HARS), a 14-item measure with scores ranging from 0 to 4 per item and a total score ranging from 0 to 56. For descriptive analysis, the study used the following categories: no anxiety (≤ 6), mild anxiety (7–14), moderate anxiety (15–27), and severe anxiety (> 27). These cutoffs are the operational categories used in the original study and are not intended to establish a psychiatric diagnosis. HARS scores were recorded before the intervention and after completion of the sessions in the third week.

Intervention and data collection

Participants received spiritual music at a tempo of 60–80 beats per minute during 30-minute sessions from 09:00 to 09:30 local time. Sessions occurred three times per week for three consecutive weeks, resulting in nine sessions. The baseline assessment preceded the first session, and the posttest took place after completion of the intervention in the third week. Figure 1 summarizes the sequence of participant selection, assessment, intervention, and analysis.

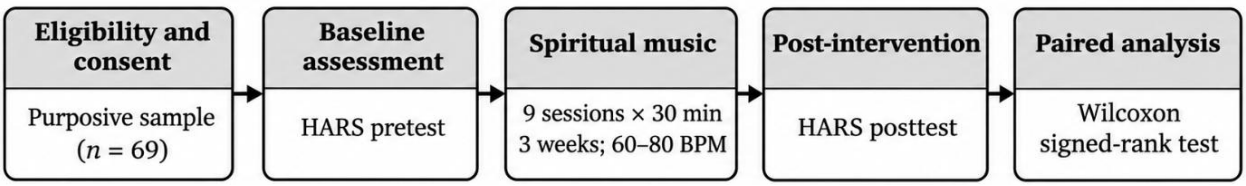

Figure 1. Study procedure and paired assessment sequence

Figure 1 presents the sequence of the one-group pretest–posttest design. Eligible participants were recruited purposively and provided informed consent. Baseline anxiety was assessed using HARS. Spiritual music was then administered in nine scheduled sessions over three weeks. After completion of the intervention, anxiety was reassessed with the same instrument. The paired observations were subsequently analyzed using the Wilcoxon signed-rank test.

Statistical analysis

Descriptive analysis summarized demographic characteristics and the distribution of anxiety categories before and after the intervention. The Kolmogorov–Smirnov and Shapiro–Wilk tests were used to assess the distributions of pretest and posttest scores. As the reported tests indicated departures from normality, paired scores were compared using the Wilcoxon signed-rank test with a two-sided significance level of 0.05. The direction of change was summarized using negative ranks, positive ranks, and ties. Means, standard deviations, and observed score ranges were retained as descriptive measures to enable comparison with the original results.

RESULTS

Demographic characteristics

All 69 participants included in the analysis completed the intervention sessions. Table 1 summarizes their demographic characteristics by sex, age group, and educational attainment.

Table 1. Demographic characteristics of participants (n = 69)

Characteristic	Category	Frequency (n)	Percentage (%)
Sex	Male	23	33.3
	Female	46	66.7
Age	60–74 years	35	50.7
	75–89 years	34	49.3
	> 90 years	0	0.0
Education	No formal education	3	4.3
	Primary school	3	4.3
	Junior high school	12	17.4
	Senior high/vocational school	37	53.6
	Higher education	14	20.3
Total participants		69	100.0

Table 1 shows that women constituted the larger proportion of participants, accounting for 46 individuals (66.7%). Men represented 23 participants (33.3%). The two represented age groups were nearly equally distributed, with 35 participants aged 60–74 years and 34 aged 75–89 years. No participant was reported in the group older than 90 years. Senior high or vocational school was the most common educational level, reported by 37 participants (53.6%). These characteristics describe the participating cohort and do not indicate differences in anxiety or intervention response between demographic groups.

Anxiety severity before and after the intervention

Table 2 presents the distribution of HARS severity categories at baseline and after completion of the spiritual music intervention.

Table 2. Distribution of anxiety severity before and after the intervention (n = 69)

Anxiety category (HARS score)	Pretest (n)	Pretest (%)	Posttest (n)	Posttest (%)
No anxiety (≤ 6)	0	0.0	12	17.4
Mild (7–14)	38	55.1	35	50.7
Moderate (15–27)	28	40.6	20	29.0
Severe (> 27)	3	4.3	2	2.9
Total	69	100.0	69	100.0

Table 2 indicates that all participants had anxiety according to the operational HARS categories at baseline. Mild anxiety was the most frequent category, comprising 38 participants (55.1%), followed by moderate anxiety in 28 participants (40.6%). After the intervention, 12 participants (17.4%) were classified in the no-anxiety category. The number classified as having moderate anxiety decreased from 28 to 20, while the severe category decreased from three to two. Mild anxiety remained the most common posttest category, with 35 participants (50.7%). The distributions describe group-level changes and do not identify every individual transition between severity categories.

Paired anxiety scores and statistical analysis

The Kolmogorov–Smirnov test yielded $p = 0.001$ for pretest scores and $p < 0.001$ for posttest scores, while the Shapiro–Wilk test yielded $p < 0.001$ at both time points. Table 3 presents the descriptive scores and reported Wilcoxon signed-rank test result.

Table 3. Descriptive HARS scores and Wilcoxon signed-rank test (n = 69)

Assessment	Minimum	Maximum	Mean	SD	Z	p
Pretest	7	40	15.26	7.24	−3.814	< 0.001
Posttest	1	42	13.01	7.73		

Table 3 shows that the mean HARS score decreased from 15.26 (SD = 7.24) at baseline to 13.01 (SD = 7.73) after the intervention. The difference between the reported means was 2.25 points. The observed pretest scores ranged from 7 to 40, whereas posttest scores ranged from 1 to 42. The Wilcoxon signed-rank test produced a Z statistic of −3.814 with a two-sided p-value below 0.001. This result indicates a statistically significant paired difference in anxiety scores across the two assessment points. The magnitude and clinical relevance of the change cannot be established from statistical significance alone.

Direction of individual score changes

The paired-rank results provide additional context for the group-level mean difference, as summarized in Table 4.

Table 4. Direction of paired HARS score changes (n = 69)

Direction of change	Frequency (n)	Mean rank	Sum of ranks
Negative ranks (posttest < pretest)	36	23.72	854.00
Positive ranks (posttest > pretest)	9	20.11	181.00
Ties (posttest = pretest)	24		
Total	69		

Table 4 shows that 36 participants had lower HARS scores after the intervention. Their mean rank was 23.72, with a sum of ranks of 854.00. Nine participants had higher posttest scores, with a mean rank of 20.11 and a sum of ranks of 181.00. The remaining 24 participants had identical pretest and posttest scores. The larger sum of negative ranks is consistent with the direction of the decline in the group mean. The findings demonstrate heterogeneous individual responses rather than a uniform reduction in anxiety.

Discussion

The principal finding was a statistically significant reduction in HARS scores after the three-week spiritual music intervention, with a mean decrease of 2.25 points. This observation is consistent with the direction of earlier evidence on nonpharmacological approaches for anxiety in long-term care (Atchison et al., 2022) and controlled studies of music listening in broader populations (Harney et al., 2023). The results are also compatible with the local study by Hitiyaut et al. (2022) and with the clinical investigation of music and anxiety in older residents with hypertension by Lorber and Divjak (2022). Nevertheless, the current study measured change without a contemporaneous comparator, whereas controlled research is better positioned to isolate an intervention's contribution. Neither the statistical significance nor the mean decline establishes that the intervention produced a clinically meaningful benefit. The evidence is therefore best understood as an encouraging within-group finding that warrants further investigation.

The shift in severity distributions provides a second perspective on the observed changes. At baseline, mild anxiety was the largest category, and 12 participants were classified as having no anxiety after the intervention. This pattern may indicate that some residents with relatively low initial scores were able to move below the operational threshold, although the available aggregate distributions do not identify their individual starting categories. In trials of individualized music, outcome selection has influenced the detection of changes; for example, Hillebrand et al. (2025) identified improvements in personalized goals without equivalent improvements on standardized quality-of-life measures. A trial of personalized music by Inoue et al. (2024) likewise assessed several outcomes, including agitation and mood, rather than treating emotional response as a single

construct. The present HARS categories should therefore be interpreted as descriptive indicators of anxiety severity, not diagnostic remission or improvement in overall quality of life.

The paired-rank distribution shows that the intervention was followed by lower scores in 36 residents, unchanged scores in 24, and higher scores in nine. Such variability is important because it prevents the group mean from being interpreted as an experience shared by all residents. Studies of personalized music interventions suggest that outcomes may depend on the form of engagement and the measure used to detect change (Hillebrand et al., 2025; Inoue et al., 2024). In a pragmatic trial, Sisti et al. (2024) found that personalized music influenced some observed behavioral and mood indicators but not others, whereas McCreedy et al. (2024) examined practical issues affecting implementation in nursing homes. These studies reinforce the importance of considering residents' individual preferences and the circumstances in which the sessions occur. Future evaluations should monitor both improvement and worsening, including whether residents find the music acceptable, rather than presuming a universally favorable response.

The schedule of nine sessions at a slow to moderate tempo provides a plausible framework for examining short-term emotional regulation. Reviews of music and stress have described potential psychological and physiological pathways, but the magnitude of responses varies with intervention conditions (Adiasto et al., 2022; de Witte et al., 2022). Exploratory research on self-selected music further illustrates uncertainty regarding stress recovery and the influence of musical selection (Adiasto et al., 2023). A controlled investigation of individual music therapy in older residents with cognitive impairment included physiological measures alongside behavioral and cognitive assessments (Mangiacotti et al., 2024), demonstrating how hypothesized mechanisms could be tested directly. In the current study, relaxation, attentional redirection, and altered stress arousal are possible explanations for the score decline, not measured mediators. The findings do not establish changes in cortisol, autonomic activity, or neural function, and the role of the selected tempo cannot be separated from other features of the intervention.

The spiritual content of the music offers an additional possible pathway for emotional reassurance. Research on religiosity and mental health has reported associations between spiritual engagement and lower psychological distress in older populations (Coelho-Júnior et al., 2022), while Abu et al. (2026) describe meaning and spiritual connection as potential sources of resilience during chronic illness. The local study by Hitiyaut et al. (2022) provides a closer contextual comparison than research on music without a religious component. However, the present study did not compare spiritual music with secular music or assess participants' religious identification, familiarity with the songs, or spiritual coping. It cannot determine whether the decline arose from musical properties, personal associations, spiritual meaning, or the broader care context. A spiritually oriented intervention is most appropriately considered an optional and preference-sensitive activity rather than a standardized religious requirement.

The age and sex composition of the sample also provides context for interpretation. Women accounted for approximately two-thirds of participants, while the represented age groups were nearly equally distributed. International evidence identifies sex, comorbidity, and social circumstances among factors associated with anxiety in later life (Shafiee et al., 2025), and nursing home research emphasizes the importance of social relationships and belonging (van de Kolk et al., 2026). These findings provide a rationale for attending to psychological needs but do not explain the present sample's response in the absence of subgroup analyses. Research on psychosocial interventions for isolation (Hoang et al., 2022) further suggests that attention and social engagement may themselves influence well-being. The results should not be interpreted as evidence of different intervention effects by sex, age, educational attainment, or social circumstances.

The international evidence from dementia care helps establish the boundaries of the current findings. Positive anxiety outcomes have been described in some randomized and quasi-experimental studies and syntheses (Feng et al., 2024; Mei et al., 2025; Salihu et al., 2024; Ting et al., 2023), but the Cochrane review by van der Steen et al. (2025) concluded that evidence for anxiety remained uncertain. Prick et al. (2024) distinguished therapist-delivered treatment from listening, and Campbell et al. (2025) compared active and receptive approaches under controlled conditions.

Kayaaslan and Lök (2025) investigated cognition and adaptation, while the multinational MIDDEL trial found no significant six-month benefit for its primary depression outcome (Sveinsdottir et al., 2025). These studies are not direct replications because their populations, intervention formats, and outcomes differ from the present study. Similarly, evidence from perioperative and intensive care settings illustrates context dependence rather than providing transferable estimates for nursing homes (Saqib et al., 2025; Xiang et al., 2024). Thus, the present short-term anxiety finding complements, but does not resolve, the inconsistent evidence across clinical populations.

Several methodological limitations affect the strength of inference and the scope of practical application. The single-group design cannot exclude regression to the mean, changes in health or care routines, expectancy effects, or natural symptom fluctuations, particularly because eligibility depended on baseline anxiety. Purposive sampling from one institution and exclusion of residents with severe hearing or cognitive impairments limit generalizability, and the use of operational HARS categories does not establish diagnostic outcomes. The absence of follow-up prevents conclusions about persistence, while the absence of an independent comparator prevents estimation of the intervention's specific contribution. Recent syntheses of music listening and treatment emphasize variation in intervention delivery and the need for more detailed evidence (Akhtar & Buja, 2026; Jang & Kunde, 2021; Lassner et al., 2025; Ma & Ma, 2023), and a pilot study of music and movement demonstrates the value of measuring implementation and psychosocial outcomes (De Nys et al., 2024). Future studies should use a randomized or otherwise credible comparison condition, assess preference and acceptability, and report paired score distributions, confidence intervals, and follow-up outcomes. Until such evidence is available, spiritual music may be explored as a complementary, voluntary activity within individualized geriatric care, not as a substitute for assessment or indicated treatment.

CONCLUSION

Mean anxiety scores among 69 older residents at Karya Kasih Nursing Home decreased from 15.26 to 13.01 following nine spiritual music sessions over three weeks. The paired difference was statistically significant ($Z = -3.814$, $p < 0.001$), although individual responses varied, including unchanged or increased scores. These findings provide preliminary evidence of short-term anxiety change within a residential care setting. Because the study did not include a control group, the change cannot be attributed solely to spiritual music, and its clinical significance and durability remain undetermined. Spiritual music may be considered as an optional complementary activity, with attention to residents' preferences and symptoms; controlled studies are recommended before drawing conclusions about effectiveness.

REFERENCES

Abu, H. O., Oyedotun, O., Bey, G., Thompson, T., Main, Z., Dunderdale, C., Khan, L., Hutton, S., Salmoirago, E., Gurwitz, J. H., Dosa, D., Kapoor, A., & Puchalski, C. (2026). Spirituality and religiosity as sources of resilience in older adults with chronic illness: A mixed methods systematic review. *Journal of the American Geriatrics Society, 74*(4), 1141–1162. https://doi.org/10.1111/jgs.70293

Adiasto, K., Beckers, D. G. J., van Hooff, M. L. M., Roelofs, K., & Geurts, S. A. E. (2022). Music listening and stress recovery in healthy individuals: A systematic review with meta-analysis of experimental studies. *PLOS ONE, 17*(6), e0270031. https://doi.org/10.1371/journal.pone.0270031

Adiasto, K., van Hooff, M. L. M., Beckers, D. G. J., & Geurts, S. A. E. (2023). The sound of stress recovery: An exploratory study of self-selected music listening after stress. *BMC Psychology, 11*, 40. https://doi.org/10.1186/s40359-023-01066-w

Akhtar, S., & Buja, A. (2026). The impact of music listening on well-being in older adults: A systematic review. *BMC Public Health, 26*, 3042. https://doi.org/10.1186/s12889-026-27955-4

Atchison, K., Watt, J. A., Ewert, D., Toohey, A. M., Ismail, Z., & Goodarzi, Z. (2022). Non-pharmacologic and pharmacologic treatments for anxiety in long-term care: A systematic review and meta-analysis. *Age and Ageing, 51*(9), afac195. https://doi.org/10.1093/ageing/afac195

Campbell, E., Hogue, J., Du, J., Issing, K., & Wosch, T. (2025). Music moves: Ettlingen dementia study - a pragmatic randomised controlled trial. *Aging & Mental Health, 29*(6), 980–991. https://doi.org/10.1080/13607863.2025.2451744

Coelho-Júnior, H. J., Calvani, R., Panza, F., Allegri, R. F., Picca, A., Marzetti, E., & Alves, V. P. (2022). Religiosity/spirituality and mental health in older adults: A systematic review and meta-analysis of observational studies. *Frontiers in Medicine, 9*, 877213. https://doi.org/10.3389/fmed.2022.877213

De Nys, L., Oyebola, E. F., Connelly, J., Ryde, G. C., & Whittaker, A. C. (2024). Digital music and movement intervention to improve health and wellbeing in older adults in care homes: A pilot mixed methods study. *BMC Geriatrics, 24*, 733. https://doi.org/10.1186/s12877-024-05324-3

de Witte, M., Aalbers, S., Vink, A., Friederichs, S., Knapen, A., Pelgrim, T., Lampit, A., Baker, F. A., & van Hooren, S. (2025). Music therapy for the treatment of anxiety: A systematic review with multilevel meta-analyses. *eClinicalMedicine, 84*, 103293. https://doi.org/10.1016/j.eclinm.2025.103293

de Witte, M., da Silva Pinho, A., Stams, G.-J., Moonen, X., Bos, A. E. R., & van Hooren, S. (2022). Music therapy for stress reduction: A systematic review and meta-analysis. *Health Psychology Review, 16*(1), 134–159. https://doi.org/10.1080/17437199.2020.1846580

Feng, X., Dang, W., & Apuke, O. D. (2024). How does group music therapy help in combating the anxiety and depression of dementia patients? A quasi-experimental investigation. *Archives of Psychiatric Nursing, 52*, 83–88. https://doi.org/10.1016/j.apnu.2024.07.010

Harney, C., Johnson, J., Bailes, F., & Havelka, J. (2023). Is music listening an effective intervention for reducing anxiety? A systematic review and meta-analysis of controlled studies. *Musicae Scientiae, 27*(2), 278–298. https://doi.org/10.1177/10298649211046979

Hillebrand, M. C., Weise, L., Itz, M. L., Jakob, E., & Wilz, G. (2025). Music matters, but so does the outcome measure: A randomized controlled trial for an individualized music intervention for people living with dementia. *Clinical Gerontologist, 48*(4), 716–728. https://doi.org/10.1080/07317115.2024.2429590

Hitiyaut, M., Hatuwe, E., & Latuihamallo, M. G. (2022). Pengaruh terapi musik rohani Kristen terhadap tingkat kecemasan lansia di Panti Sosial Tresna Werdha Inakaka Provinsi Maluku [The effect of Christian spiritual music therapy on anxiety among older adults in a social care facility]. *Jurnal Rumpun Ilmu Kesehatan, 2*(1), 15–20.

Hoang, P., King, J. A., Moore, S., Moore, K., Reich, K., Sidhu, H., Tan, C. V., Whaley, C., & McMillan, J. (2022). Interventions associated with reduced loneliness and social isolation in older adults: A systematic review and meta-analysis. *JAMA Network Open, 5*(10), e2236676. https://doi.org/10.1001/jamanetworkopen.2022.36676

Inoue, M., Ihara, E. S., Layman, S., Li, M.-H., Nosrat, S., Mehak, S., Barrett, K., Magee, C., McNally, K. A., Moore, M., & Tompkins, C. J. (2024). A personalized music intervention in nursing home residents living with dementia: Findings from a randomized study. *Journal of Applied Gerontology, 43*(11), 1611–1620. https://doi.org/10.1177/07334648241257797

Jang, S., & Kunde, L. (2021). A systematic review of music therapy interventions used to address emotional needs of older adults. *The Arts in Psychotherapy, 76*, 101842. https://doi.org/10.1016/j.aip.2021.101842

Kayaaslan, B., & Lök, N. (2025). The effect of music therapy on cognitive functions and adaptation level in Alzheimer's patients: A randomized controlled trial pilot study. *Psychology, Health & Medicine*. Advance online publication. https://doi.org/10.1080/13548506.2025.2543902

Lassner, A., Siafis, S., Wiese, E., Leucht, S., Metzner, S., Wagner, E., & Hasan, A. (2025). Evidence for music therapy and music medicine in psychiatry: Transdiagnostic meta-review of meta-analyses. *BJPsych Open, 11*(1), e4. https://doi.org/10.1192/bjo.2024.826

Lorber, M., & Divjak, S. (2022). Music therapy as an intervention to reduce blood pressure and anxiety levels in older adults with hypertension: A randomized controlled trial. *Research in Gerontological Nursing, 15*(2), 85–92. https://doi.org/10.3928/19404921-20220218-03

Ma, G., & Ma, X. (2023). Music intervention for older adults: Evidence map of systematic reviews. *Medicine, 102*(48), e36016. https://doi.org/10.1097/MD.0000000000036016

Mangiacotti, A. M. A., Hsu, M. H., Barone, C., Van Puyvelde, M., Zandonà, A., Gabai, G., Biasutti, M., & Franco, F. (2024). Effects of one-to-one music therapy in older adults with cognitive impairment: A randomized controlled trial. *Psychology and Aging, 39*(8), 960–982. https://doi.org/10.1037/pag0000861

McCreedy, E. M., Dewji, A., Dionne, L., Zhu, E., Baier, R. R., Reddy, A., Olson, M. B., & Rudolph, J. L. (2024). Pragmatic implementation of a music intervention in nursing homes before and during COVID-19. *Journal of the American Medical Directors Association, 25*(2), 314–320. https://doi.org/10.1016/j.jamda.2023.10.021

Mei, Z., Zhang, Y., Zhao, W., Lam, C., Luo, S., Wang, S., & Luo, S. (2025). Music-based interventions for anxiety and depression in older adults with dementia: A systematic review of randomized controlled trials. *Complementary Therapies in Clinical Practice, 59*, 101951. https://doi.org/10.1016/j.ctcp.2025.101951

Orgeta, V., Leung, P., Del-Pino-Casado, R., Qazi, A., Orrell, M., Spector, A. E., & Methley, A. M. (2022). Psychological treatments for depression and anxiety in dementia and mild cognitive impairment. *Cochrane Database of Systematic Reviews, 2022*(4), CD009125. https://doi.org/10.1002/14651858.CD009125.pub3

Prick, A.-E. J. C., Zuidema, S. U., van Domburg, P., Verboon, P., Vink, A. C., Schols, J. M. G. A., & van Hooren, S. (2024). Effects of a music therapy and music listening intervention for nursing home residents with dementia: A randomized controlled trial. *Frontiers in Medicine, 11*, 1304349. https://doi.org/10.3389/fmed.2024.1304349

Salihu, D., Chutiyami, M., Bello, U. M., Sulaiman, S. K., Dawa, K. K., Hepworth, A., Adeleye, K. K., & Alruwaili, M. M. (2024). A meta-review of systematic reviews on the effectiveness of music therapy on depression, stress, anxiety and cognitive function in adult's with dementia or cognitive impairment. *Geriatric Nursing, 60*, 348–360. https://doi.org/10.1016/j.gerinurse.2024.09.014

Saqib, M., Batool, A., Iftikhar, Q. U. A., Akbar, M. A., Qadri, F. H., Maryam, K. U. E., Naqvi, S. A. Z., Haq, A. N. U., & Hasan, F. (2025). Effect of music intervention on anxiety in critically ill patients, a meta-analysis of randomized controlled trials. *Journal of Critical Care, 89*, 155133. https://doi.org/10.1016/j.jcrc.2025.155133

Shafiee, A., Mohammadi, I., Rajai, S., Jafarabady, K., & Abdollahi, A. (2025). Global prevalence of anxiety symptoms and its associated factors in older adults: A systematic review and meta-analysis. *Journal of General and Family Medicine, 26*(2), 116–127. https://doi.org/10.1002/jgf2.750

Sisti, A., Gutman, R., Mor, V., Dionne, L., Rudolph, J. L., Baier, R. R., & McCreedy, E. M. (2024). Using structured observations to evaluate the effects of a personalized music intervention on agitated behaviors and mood in nursing home residents with dementia: Results from an embedded, pragmatic randomized controlled trial. *The American Journal of Geriatric Psychiatry, 32*(3), 300–311. https://doi.org/10.1016/j.jagp.2023.10.016

Sveinsdottir, V., Assmus, J., Schneider, J., Baker, F. A., Uçaner, B., Kreutz, G., Geretsegger, M., Rasing, N., Bloska, J., Stretton-Smith, P. A., Lee, Y.-E. C., Wake, J. D., Odell-Miller, H., Tamplin, J., Vink, A. C., Ablewhite, J., Neuser, J., Frischen, U., Timmer, A., ... Gold, C. (2025). Clinical effectiveness of music interventions for dementia and depression in older people (MIDDEL): A multinational, cluster-randomised controlled trial. *The Lancet Healthy Longevity, 6*, 100783. https://doi.org/10.1016/j.lanhl.2025.100783

Ting, B., Chen, D. T.-L., Hsu, W.-T., Liang, C.-S., Malau, I. A., Li, W.-C., Lee, S.-L., Li, J., & Su, K.-P. (2023). Does music intervention improve anxiety in dementia patients? A systematic review and meta-analysis of randomized controlled trials. *Journal of Clinical Medicine, 12*(17), 5497. https://doi.org/10.3390/jcm12175497

van de Kolk, D., Andringa, G., de Korne, D. F., & Huijsman, R. (2026). A scoping review of influencing factors associated with loneliness in nursing home settings. *Aging & Mental Health, 30*(2), 311–324. https://doi.org/10.1080/13607863.2025.2552427

van der Steen, J. T., van der Wouden, J. C., Methley, A. M., Smaling, H. J. A., Vink, A. C., & Bruinsma, M. S. (2025). Music-based therapeutic interventions for people with dementia. *Cochrane Database of Systematic Reviews, 2025*(3), CD003477. https://doi.org/10.1002/14651858.CD003477.pub5

Xiang, S.-R., Ma, Q., Dong, J., Ren, Y.-F., Lin, J.-Z., Zheng, C., Xiao, P., & You, F.-M. (2024). Contrasting effects of music therapy and aromatherapy on perioperative anxiety: A systematic review and meta-analysis. *Complementary Medicine Research, 31*(3), 278–291. https://doi.org/10.1159/000538425

Zhang, K., Tabuchi, R. A., Zhang, K., & Finnerty, R. (2025). Music engagement for stress and anxiety in adults during the COVID-19 pandemic: A systematic review. *Psychology of Music, 53*(1), 92–110. https://doi.org/10.1177/03057356231225670