The effect of dance movement therapy on physical activity levels, mood, and emotional resilience among older adults in Indonesia

Gilang Dwi Pratiwi[1*], Vita Lucya[1], Linlin Lindayani[2]

[1] Department of geriatric nursing, STIKep PPNI Jawa Barat, Bandung, Indonesia
[2] Department of medical surgical nursing, STIKep PPNI Jawa Barat, Bandung, Indonesia

Abstract

Background: Dance movement therapy (DMT) is a promising intervention integrating physical activity with creative expression to enhance physical, psychological, and social well-being. While evidence of DMT's benefits exists, studies in non-Western contexts, particularly Indonesia, are scarce.
Purpose: This study aimed to evaluate the effect of DMT on physical activity levels, mood, and emotional resilience among older adults in Indonesia.
Methods: A quasi-experimental study with pre-test and post-test design was conducted among 350 older adults (≥60 years) in Bandung, Indonesia. Participants were allocated into intervention (n=175) and control groups (n=175). The intervention group participated in 12 weeks of DMT inspired by traditional Sundanese dance, conducted twice weekly for 60 minutes per session. Outcomes, including physical activity levels (IPAQ-SF), mood (PANAS), and emotional resilience (CD-RISC-10), were measured at baseline and post-intervention. Data were analyzed using paired t-tests, independent t-tests, and multivariate regression.
Results: The intervention group showed significant improvements in physical activity (mean MET-min/week: 1584 ± 420 vs. 1230 ± 356, $p < 0.001$), positive mood (mean PANAS score: 35.6 ± 8.4 vs. 28.3 ± 7.6, $p < 0.001$), and resilience (mean CD-RISC-10 score: 31.2 ± 7.3 vs. 24.8 ± 6.2, $p < 0.001$) compared to the control group. Multivariate regression analysis confirmed that the intervention was a significant predictor of outcome changes, controlling for baseline characteristics.
Conclusion: DMT significantly enhanced physical activity, mood, and emotional resilience in older adults. This culturally tailored intervention demonstrates potential as a holistic strategy to promote healthy aging in Indonesia. Future research should explore its scalability and long-term impact.

Keywords: dance movement therapy, emotional resilience, healthy aging, mood, older adults, physical activity.

Introduction

Population aging is a global phenomenon, with older adults increasingly forming a significant proportion of society. Worldwide, the proportion of individuals aged 60 years or older is expected to double by 2050, reaching 22% of the global population (World Health Organization (WHO), 2021). Similarly, in Indonesia, the percentage of people aged 60 and older is projected to rise sharply, from 10% in 2020 to nearly 20% by 2045 (Mitchell & Walker, 2020; BPS, 2022). This demographic shift presents complex challenges, including ensuring adequate health care, addressing social isolation, and fostering economic sustainability. Another pressing concern is the rising prevalence of non-communicable diseases (NCDs), such as hypertension, diabetes, and cardiovascular diseases, among older adults. Globally, NCDs account for over 70% of deaths among older adults

OPEN ACCESS

Jurnal Keperawatan Padjadjaran (JKP)

Volume 13(2), 172-181
© The Author(s) 2025
http://dx.doi.org/10.24198/jkp.v13i2.2695

Article Info

Received : December 31, 2024
Revised : August 12, 2025
Accepted : August 25, 2025
Published : August 30, 2025

Corresponding author

Gilang Dwi Pratiwi*
Department of geriatric nursing STIKep PPNI Jawa Barat, Indonesia; Jln, Muhammad No 31, Bandung, Indonesia; Phone: (022) 612 1914, E-mail: gilangdwipratiwi@gmail.com

Citation

Pratiwi, G. D., Lucya, V., & Lindayani, L. (2025). The effect of dance movement therapy on physical activity levels, mood, and emotional resilience among older adults in Indonesia. *Jurnal Keperawatan Padjadjaran, 13*(2), 172-181. http://dx.doi.org/10.24198/jkp.v13i2.2695

Website

http://jkp.fkep.unpad.ac.id/index.php/jkp

E-ISSN: 2442-7276
P-ISSN: 2338-5324

(WHO, 2021), while in Indonesia, they contribute significantly to morbidity and mortality rates in this demographic (The Ministry of Health of Republic of Indonesia, 2021).

Low physical activity is a global public health concern among older adults, significantly contributing to the burden of non-communicable diseases and increased mortality (Zhu, Gu, & Xu, 2020). Beyond its direct physical health consequences, inadequate physical activity also affects mental well-being; physically inactive older adults are more likely to experience depression and anxiety, which in turn can further reduce their motivation to be active, creating a negative cycle that diminishes overall quality of life (Maharani, 2022). These mental health challenges also compound social problems, as limited mobility and reduced participation in activities can lead to social isolation, depriving older adults of the community engagement that supports both mental and physical health (Chase et al., 2020). In Indonesia, the interplay of these physical, psychological, and social factors is especially concerning given the rapid growth of the aging population. The lack of structured, age-friendly physical activity programs not only accelerates physical decline but also indirectly contributes to emotional distress and reduced resilience, further perpetuating withdrawal from social and physical engagement (Maharani, 2022; Utomo et al., 2019).

The scale of the problem is reflected in global and national data. The World Health Organization (WHO) estimates that over 25% of adults worldwide fail to meet the recommended levels of physical activity, with older adults disproportionately affected due to age-related physical and functional decline (WHO, 2020; Kong et al., 2021). In Indonesia, the prevalence of low physical activity is alarmingly high, with 33.5% of the adult population insufficiently active, and rates among older adults particularly elevated (The Ministry of Health of Republic of Indonesia, 2021). Physical inactivity is driven by multifactorial influences, including cultural norms, environmental constraints, and systemic gaps in healthcare, as well as disparities between rural and urban areas, limited access to exercise facilities, and the effects of urbanization (Syaukani et al., 2024; Katzmarzyk et al., 2022; Koa et al., 2024). These same factors also shape mental health outcomes, as environments that limit physical activity opportunities can heighten the risk of depression and anxiety, which in turn further discourage physical participation, reinforcing the inactivity–mental health cycle.

Mood disorders, including depression and anxiety, are among the most common psychological conditions affecting older adults and are deeply intertwined with physical inactivity. Globally, approximately 14% of individuals aged 60 and older experience a mental disorder, with depression and anxiety most prevalent (WHO, 2020). In Indonesia, the prevalence of mental health disorders in those over 15 years increased from 6% in 2013 to 9.8% in 2018, with depression affecting 6.1% of this group (Hisan et al., 2023). Depression is not only linked to cardiovascular disease, cognitive decline, and increased mortality (Jiang, 2020) but also reduces resilience that the capacity to adapt to challenges, thereby making it more difficult to maintain physical activity or social engagement. Furthermore, depression exacerbates memory decline and elevates stress levels, contributing to hypertension and other cardiovascular risks (Faustino & Fonseca, 2023; Shao et al., 2020). Addressing mood disorders in older adults is critical, as these conditions are often underdiagnosed and undertreated, contributing to a reduced quality of life and increased disability (Luo et al., 2022). This bidirectional relationship means that poor mental health both results from and contributes to reduced physical activity and diminished resilience, perpetuating a downward health trajectory.

Resilience, defined as the capacity to adapt effectively to stressors or adversity, plays a pivotal role in breaking this cycle. It is shaped by emotional regulation, social support, and a sense of purpose; all of which can be eroded by both physical inactivity and mood disorders (MacLeod et al., 2016; Windle et al., 2011). Declining resilience not only increases vulnerability to depression and anxiety but also undermines motivation and ability to engage in physical activity (Fisher et al., 2016; Zheng et al., 2020). Conversely, higher resilience can buffer the negative effects of aging, helping older adults remain active, socially connected, and psychologically healthy. Evidence suggests that interventions promoting physical activity, enhancing social engagement, and supporting emotional coping skills, such as mindfulness-based stress reduction can strengthen resilience and simultaneously improve mental health and physical functioning (Smith et al., 2018; Wu et al., 2023). Therefore, addressing low physical activity, mood disorders, and poor resilience in an integrated manner is essential to improving healthy aging outcomes in Indonesia and beyond.

To address these interconnected challenges, interventions promoting physical activity, mood, and psychological resilience have shown promise. Programs incorporating aerobic and resistance training have been found to improve mood and cognitive function while reducing the risk of chronic diseases (Giebel et al., 2022). Simultaneously, resilience-building strategies such as mindfulness training, community engagement, and structured counseling have demonstrated effectiveness in mitigating stress and enhancing emotional well-being (Keadle et al., 2016). These approaches highlight the need for comprehensive strategies to support the mental and physical health of older adults in Indonesia and globally.

Dance movement therapy (DMT) has emerged as an effective non-pharmacological intervention for older adults, integrating rhythmic physical activity with creative expression to enhance physical, emotional, and social well-being (Millman et al., 2021). Its low-

impact nature makes it particularly suitable for aging populations, as it promotes physical activity while addressing emotional resilience and fostering social connection (Hyvönen et al., 2020; Karkou et al., 2019a). Research indicates that DMT can improve physical activity levels by enhancing motivation and adherence through its enjoyable and social nature (Burzynska et al.,2017; Murillo-Garcia et al., 2021). Additionally, it has been shown to reduce symptoms of depression and anxiety, while simultaneously enhancing emotional resilience and social bonding (Karkou et al., 2019b; Millman et al., 2021). Furthermore, DMT has been linked to improved mood, cognitive functioning, and quality of life among older adults, offering a holistic approach to age-related health challenges (Karkou et al.,2023).

In Indonesia, cultural expressions often involve dance, suggesting that DMT could be particularly relevant and well-received among older adults (Rahmawati et al, 2020). However, studies on DMT in this population remain scarce, and most existing evidence originates from Western contexts, limiting its applicability to Indonesia's unique cultural and societal settings. Moreover, while DMT has demonstrated benefits in improving mood and emotional resilience, few studies have examined its effects on physical activity levels among older adults (Millman et al., 2021).

Despite increasing interest in DTM as a therapeutic approach, research examining its comprehensive effects on physical, psychological, and emotional outcomes in older adults remains limited, particularly in non-Western contexts like Indonesia. Most existing studies emphasize singular outcomes, such as mood enhancement or improved social connectedness, without addressing the interconnected benefits across multiple domains, including physical activity levels, emotional resilience, and overall well-being. Moreover, the cultural relevance and feasibility of adapting DMT interventions in Indonesian settings are underexplored, restricting their potential for broader implementation and acceptance (Bradt et al.,2015; Millman et al., 2021).

This study aims to evaluate the effectiveness of dance movement therapy in improving physical activity levels, enhancing mood, and fostering emotional resilience among older adults in Indonesia. The findings are expected to contribute to the development of culturally tailored interventions to promote healthy aging in the Indonesian context.

Materials and Methods

Design

This study employed a quasi-experimental design with pre-test and post-test measures to evaluate the effect of dance movement therapy (DMT) on physical activity levels, mood, and emotional resilience among older adults. The intervention was conducted over 12 weeks in selected community health centers in Bandung, West Java, Indonesia.

Intervention

The intervention was rooted in Sundanese cultural traditions, incorporating movements inspired by Jaipongan, a traditional Sundanese dance characterized by its dynamic and rhythmic patterns. The inclusion of culturally resonant elements aimed to enhance participant engagement and cultural connection (Rahapsari, 2017).

The DMT sessions were conducted over a 12-week period at selected community centers. Each session lasted approximately 60 minutes, with participants attending two sessions per week. The therapy combined traditional Jaipongan dance movements, including swaying arm motions (lenggang lenggok), rhythmic hand gestures (ulah tangan), and gentle footwork (jelema), with relaxation techniques to ensure accessibility for older adults. The movements were adapted to accommodate varying levels of physical fitness, emphasizing inclusivity and safety (Kusuma & Priyanti, 2020). Each session began with a 10-minute warm-up to prepare participants physically and mentally, followed by a 40-minute guided dance segment focusing on fluidity and coordination. The sessions concluded with a 10-minute cooldown involving light stretches and breathing exercises, fostering relaxation and mindfulness. Participants were encouraged to maintain their comfort and avoid overexertion during the sessions (Douka et al., 2019).

Participants were provided with step-by-step guidance by certified instructors familiar with both traditional Sundanese dance and DMT principles. Regular feedback and motivational reminders every two weeks were integral to sustaining motivation and promoting adherence throughout the program (Chen et al., 2024) To maintain consistency, all sessions followed a standardized schedule, and attendance was recorded.

Sample

The study included a total of 350 older adults aged 60 years and above, residing in community settings in Indonesia. Participants were divided into intervention and control groups using a non-randomized allocation method. Participants were included if they were aged 60 years or older, able to perform moderate physical activity as confirmed by a physician, had no severe cognitive impairments (Mini-Mental State Examination [MMSE] score ≥ 24), and provided written informed consent. Participants were excluded if they had acute or chronic illnesses that could hinder participation in the intervention, currently participating in other physical activity programs, haad a history of severe mental health conditions.

The required sample size was calculated using G*Power software version 3.1.9.7 (Faul et al., 2007). Based on an expected effect size of 0.25 (medium), a significance level of 0.05, and a power of 0.80, the required total sample size for a two-group comparison was 350 participants.

Table 1. Demographic Characteristics of Participants (N = 350)

Variable	Intervention Group (n = 175)	Control Group (n = 175)	p-value
Age (mean ± SD)	67.2 ± 4.5	67.0 ± 4.8	0.662
Gender (Female, n, %)	112 (64.0)	108 (61.7)	0.687
Education (n, %)			
Primary	56 (32.0)	61 (34.9)	0.562
Secondary	87 (49.7)	80 (45.7)	
Higher	32 (18.3)	34 (19.4)	
Marital Status (Married, n, %)	129 (73.7)	126 (72.0)	0.744

Table 2. Comparison of Outcomes Between Intervention and Control Groups

Outcome	Timepoint	Intervention Group (mean ± SD)	Control Group (mean ± SD)	p-value (between groups)
Physical Activity (MET-min/week)	Baseline	1230 ± 356	1254 ± 342	0.541
	Post	1584 ± 420	1278 ± 365	<0.001
Positive Mood (PANAS)	Baseline	28.3 ± 7.6	27.9 ± 7.2	0.638
	Post	35.6 ± 8.4	28.1 ± 7.8	<0.001
	Baseline	24.8 ± 6.2	24.4 ± 6.1	0.551
Resilience (CD-RISC-10)	Post	31.2 ± 7.3	25.0 ± 6.4	<0.001

Table 3. Multivariate Regression Analysis of Outcome Changes

Outcome	β (95% CI)	SE	t-value	p-value
Physical Activity (MET-min/week)	0.62 (0.54, 0.70)	0.04	15.5	<0.001
Positive Mood (PANAS)	0.68 (0.60, 0.76)	0.04	17.0	<0.001
Resilience (CD-RISC-10)	0.58 (0.49, 0.67)	0.05	11.6	<0.001

Community health centers were assigned to either the intervention (Dance Movement Therapy, DMT) or comparison (usual activities/waitlist) group based on operational feasibility and to minimize cross-contamination. In centers hosting both groups, a staggered schedule was used: the first 8-week cohort received DMT, while a later comparable cohort served as the comparison group and was offered DMT after follow-up. Baseline comparability was enhanced through matching on sex and 5-year age bands, and key covariates (physical activity, depressive symptoms, resilience, comorbidities) were documented for adjustment in multivariable and propensity score analyses. Outcome assessors and data analysts were blinded; separate rooms/times and non-overlapping facilitators limited contamination. Session reminders and flexible scheduling supported retention, with all withdrawals recorded for intention-to-treat analysis.

Instruments

The International Physical Activity Questionnaire-Short Form (IPAQ-SF) (Craig et al., 2003) was used to measure physical activity levels. The IPAQ-SF includes 7 items that assess walking, moderate-intensity activities, and vigorous-intensity activities in the last 7 days. Scores are expressed as MET-minutes/week. The original version of the IPAQ-SF has good reliability (Cronbach's α = 0.79) and was validated for use in Bahasa Indonesia (Cronbach's α = 0.82) (Dharmansyah & Budiana, 2021).

Mood was assessed using the Positive and Negative Affect Schedule (PANAS) (Watson et al., 1988), which consists of 20 items, with 10 items measuring positive affect and 10 measuring negative affect. Responses are rated on a 5-point Likert scale, with higher scores indicating higher levels of affect. The PANAS demonstrates excellent reliability (Cronbach's α > 0.80), and its Bahasa Indonesia version has shown similar reliability (Cronbach's α = 0.81) (Haywood et al., 2024).

The Connor-Davidson Resilience Scale (CD-RISC-10) (Connor & Davidson, 2003) was used to measure emotional resilience. This 10-item scale evaluates adaptability and coping under stress, with responses scored on a 5-point Likert scale. Higher scores indicate greater resilience. The CD-RISC-10 has good reliability (Cronbach's α = 0.85) and is

validated in Bahasa Indonesia (Cronbach's α = 0.84) (Ningsih et al., 2023).

Procedure

The study received ethical approval from the Institutional Review Board (IRB) at STIKep PPNI Jawa Barat, Protocol No: III/0111/KEPK/STIKep/PPNI/Jabar/III/2024. After IRB approval, community centers were approached for collaboration. Recruitment materials were distributed, and interested participants attended an orientation session. Eligible participants provided written informed consent before baseline data collection. The intervention group participated in 12 weeks of dance movement therapy sessions, conducted twice a week for 60 minutes per session, led by certified instructors. The control group continued with their usual activities and received an educational brochure about general physical activity benefits. Pre-test assessments for physical activity levels, mood, and emotional resilience were conducted prior to the intervention. Post-test assessments were conducted immediately after the 12-week intervention. Feedback from participants was collected at the end of the intervention through a structured questionnaire.

Data Analysis

Descriptive statistics were used to summarize demographic and baseline characteristics. Paired t-tests and independent t-tests were performed to evaluate within-group and between-group differences, respectively. Multiple regression analysis was conducted to explore the association between intervention exposure and changes in physical activity levels, mood, and emotional resilience, controlling for baseline characteristics. Statistical significance was set at $p < 0.05$, and analyses were performed using SPSS version 26 (IBM Corp., 2019).

Results

The study included 350 participants equally divided into intervention and control groups (n = 175 per group). The demographic characteristics of the participants are summarized in Table 1. Participants in both groups were predominantly female, with a mean age of approximately 67 years. Most participants had completed secondary education, and the majority were married. Baseline characteristics were comparable between groups, with no significant differences observed.

Table 2 presents the means and standard deviations for physical activity levels, mood, and emotional resilience at baseline and post-intervention. Significant improvements were observed in the intervention group for all three outcomes compared to baseline. In contrast, the control group showed minimal changes.

Multivariate regression analysis was conducted to examine the association between the intervention and changes in outcomes, controlling for baseline characteristics (age, gender, and education). The intervention was a significant predictor of improvements in physical activity levels, positive mood, and resilience, as shown in Table 3.

Discussion

The findings of this study demonstrate the significant impact of the intervention on physical activity levels, mood, and emotional resilience among older adults. These results highlight the effectiveness of structured programs in promoting holistic health outcomes, which is consistent with previous research emphasizing the importance of tailored interventions in aging populations (Barak et al., 2022; Porter et al.,2017; Sathianet al., 2024). The observed improvements in physical activity levels are particularly noteworthy. Regular physical activity is a critical component of healthy aging, linked to reduced risks of chronic diseases and improved functional abilities (Giebel et al., 2022; WHO, 2021; Rebelo-Marques et al., 2018). The intervention's design, incorporating structured and accessible activities, likely contributed to these outcomes. This finding aligns with the work of Sims-Gould et al. (2020) Click or tap here to enter text., who reported similar enhancements in physical activity through community-based programs targeting older adults.

The significant positive effects on mood and emotional resilience observed in this study further underscore the intervention's value. In this context, Dance Movement Therapy (DMT), particularly the form implemented in this study with a cultural approach appears to have been a key driver of these psychosocial benefits. DMT operates on the principle that movement and emotional states are interconnected; rhythmic, expressive, and improvisational movement stimulates the release of endorphins and modulates neurotransmitters such as serotonin and dopamine, which are directly linked to improved mood and reduced symptoms of depression and anxiety (Kong et al., 2021; Sampath & Soohinda, 2023; Zheng et al., 2020). Moreover, the structured group format of DMT promotes social bonding and non-verbal communication, enhancing a sense of belonging and reducing feelings of isolation both of which are essential to building resilience in older adults (Sánchez-González et al., 2020). From a resilience perspective, DMT fosters self-efficacy and adaptive coping by encouraging participants to explore and express emotions through movement, reinforcing a sense of mastery and control over their physical and emotional states (Delhom et al., 2020).

The cultural adaptation of DMT used in this study likely amplified these benefits. Incorporating familiar traditional music, movements, and cultural narratives not only increased engagement and enjoyment but also enhanced emotional resonance by evoking shared memories and collective identity (Giebel et al., 2022; Ingrand et al., 2018; Sathian

et al., 2024). This cultural grounding can deepen participants' emotional connection to the activity, improve adherence, and strengthen the therapeutic impact by integrating personal and community meaning into the movement experience. Such culturally relevant approaches have been shown to improve both participation rates and psychosocial outcomes in older adult interventions (Han et al., 2022). Therefore, the combination of DMT's intrinsic therapeutic mechanisms and its cultural tailoring in this study likely contributed to the observed gains in mood and resilience.

Older adults often face increased risks of emotional distress due to factors such as social isolation and health decline (Kong et al., 2021; Sampath & Soohinda, 2023; Zheng et al., 2020). By integrating components aimed at improving emotional well-being — including group interactions, mindfulness elements within the movement sessions, and culturally familiar artistic expression that the intervention addressed key psychosocial determinants of health (Sánchez-Gonzálezet al., 2020). This aligns with findings from Delhom et al. (2020), who demonstrated that structured psychosocial interventions significantly enhance emotional resilience in aging populations. These results support the growing body of literature advocating for evidence-based, culturally adapted interventions to address physical, emotional, and social health dimensions in older adults (Giebel et al., 2022; Ingrand et al., 2018; Sathian et al., 2024). The use of regression analysis provided further insights into the predictors of health improvements, suggesting that both the duration of participation and baseline levels of activity were significant moderators of the outcomes (Buyl et al., 2020). These findings resonate with similar studies, such as those by Patel et al. (Che & Cheung, 2024), which highlight the moderating effects of engagement duration on intervention efficacy.

The predominance of female participants in this study may reflect cultural and family role dynamics that influence participation in community-based health programs. In many Indonesian communities, older women particularly those who are retired or no longer engaged in formal employment tend to have greater availability to participate in scheduled group activities compared to men, who may still be involved in income-generating work or community leadership roles (Absor et al., 2024). Additionally, societal norms often position women as primary caregivers within the family, making them more accustomed to engaging in community health or social programs, while men may perceive such activities as less aligned with traditional masculine roles (Utomo et al., 2019). In contrast, older women may be more likely to receive support from children or relatives to engage in such programs, both as a form of social interaction and as a way to maintain health. These cultural and family dynamics could partly explain the gender distribution observed in this study and should be considered when designing outreach strategies to increase male participation.

Nursing implication

The implications of this study are multifaceted and significant for both policymakers, nursing and other healthcare providers. First, it provides robust evidence supporting the prioritization of structured interventions as a cost-effective strategy to enhance the quality of life (QoL) among older adults. Structured interventions, particularly those combining physical activity with behavioral and psychosocial components, have been shown to positively impact mental health, physical function, and overall well-being in aging populations (Biddle et al., 2019; Ngandu et al., 2015). This evidence reinforces the importance of adopting holistic approaches in healthcare policy to improve the quality of care for older adults. Second, the study underscores the necessity of designing programs that integrate physical activity with psychosocial support to address the complex and multifaceted needs of older adults. Tailored interventions that focus on the interplay between physical and psychosocial health are essential for managing age-related challenges, including loneliness, mobility limitations, and chronic health conditions (Jeong et al., 2023; Keadle et al., 2016). By addressing these interconnected factors, such programs can enhance not only physical health but also the emotional resilience and social engagement of older adults. Lastly, the findings encourage future research to explore scalable models of similar interventions to ensure broader accessibility and sustainability. The scalability of interventions is crucial for reaching diverse populations and reducing healthcare disparities among older adults, especially in resource-limited settings (Beard et al., 2016; Lee & Zhong, 2019). Future studies should focus on leveraging technology and community-based approaches to deliver these interventions at scale, maximizing their impact while minimizing costs.

Limitations of the study

While the study provides valuable insights, several limitations should be acknowledged. The sample was limited to a specific geographic region, potentially restricting the generalizability of the findings. Furthermore, the relatively small sample size may have reduced the statistical power, limiting the ability to detect subtle but meaningful effects. The study also relied on self-reported measures for mood and emotional resilience, which may be subject to response biases, such as social desirability or recall inaccuracies. The cross-sectional design of the study limits the ability to infer causality, as it only provides a snapshot of associations at a single point in time. Additionally, unmeasured confounding variables, such as socioeconomic status or access to mental health resources, may have influenced the results. Future studies should consider employing objective measures, such as biomarker analysis or third-party assessments, and expanding the

participant pool to include more diverse populations across various regions. Longitudinal designs and randomized controlled trials would also strengthen the evidence base by enabling causal inferences and tracking changes over time.

Conclusions

In conclusion, the intervention significantly enhanced physical activity levels, mood, and emotional resilience among older adults, offering a promising and culturally adaptable approach to improving health outcomes in this demographic. The use of Dance Movement Therapy (DMT) as a central component proved effective not only in stimulating physical engagement but also in fostering emotional expression, social connection, and adaptive coping. Importantly, the integration of a cultural approach through the use of traditional music, familiar movement patterns, and community-centered narratives appeared to enhance participant engagement, emotional resonance, and sustained participation, thereby amplifying the therapeutic effects. These findings emphasize the importance of implementing health promotion programs that integrate physical and psychosocial elements, while also tailoring activities to align with participants' cultural identities and lived experiences. Future research should build on these findings to refine DMT-based intervention strategies, examine their long-term sustainability, and expand their reach to diverse aging populations across different cultural settings.

Declaration of Interest

All authors declare no conflict of interest

Acknowledgment

The authors are grateful to the participants in this study

Funding

The author received no financial support in manuscript research

Data Availability

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

References

Absor, M. U., McDonald, P., Utomo, A., & Houle, B. (2024). Care arrangements of older persons in rural Indonesia: A study of six villages. *Asian Population Studies, 20*(3), 245-267. https://doi.org/10.1080/17441730.2023.2193520

Barak, S., Rabinovitz, T., Akiva-Maliniak, A. B., Schenker, R., Meiry, L., & Tesler, R. (2022). An Individually Tailored Program to Increase Healthy Lifestyle Behaviors among the Elderly. *International journal of environmental research and public health, 19*(17), 11085. https://doi.org/10.3390/ijerph191711085

Beard, J. R., Officer, A., de Carvalho, I. A., Sadana, R., Pot, A. M., Michel, J. P., Lloyd-Sherlock, P., Epping-Jordan, J. E., Peeters, G. M. E. E. G., Mahanani, W. R., Thiyagarajan, J. A., & Chatterji, S. (2016). The World report on ageing and health: a policy framework for healthy ageing. *Lancet (London, England), 387*(10033), 2145–2154. https://doi.org/10.1016/S0140-6736(15)00516-4

Biddle, S. J. H., Ciaccioni, S., Thomas, G., & Vergeer, I. (2019). Physical activity and mental health in children and adolescents: An updated review of reviews and an analysis of causality. *Psychology of Sport and Exercise, 42,* 146–155.

BPS. (2022). Population and Population Distribution by Sub-district 2020-2022. Retrieved from BPS Kota Sukabumi. website: https://sukabumikota.bps.go.id/indicator/12/261/1/penduduk-dan-distribusi- penduduk-menurut-kecamatan.html

Bradt, J., Shim, M., & Goodill, S. W. (2015). Dance/movement therapy for improving psychological and physical outcomes in cancer patients. *The Cochrane database of systematic reviews, 1*(1), CD007103. https://doi.org/10.1002/14651858.CD007103.pub3

Burzynska, A. Z., Finc, K., Taylor, B. K., Knecht, A. M., & Kramer, A. F. (2017). The Dancing Brain: Structural and Functional Signatures of Expert Dance Training. *Frontiers in human neuroscience, 11*, 566. https://doi.org/10.3389/fnhum.2017.00566

Buyl, R., Beogo, I., Fobelets, M., Deletroz, C., Van Landuyt, P., Dequanter, S., Gorus, E., Bourbonnais, A., Giguère, A., Lechasseur, K., & Gagnon, M. P. (2020). e-Health interventions for healthy aging: a systematic review. *Systematic reviews, 9*(1), 128. https://doi.org/10.1186/s13643-020-01385-8

Chase, J. D., Otmanowski, J., Rowland, S., & Cooper, P. S. (2020). A systematic review and meta-analysis of interventions to reduce sedentary behavior among older adults. *Translational behavioral medicine, 10*(5), 1078–1085. https://doi.org/10.1093/tbm/ibz189

Che, R. P., & Cheung, M. C. (2024). Factors Associated With Intended Utilization of Home-Based Long-Term Care Among Older Adults in China: The Moderating Effect of Community Support. The journals of gerontology. *Series B, Psychological sciences and social sciences, 79*(11), gbae146. https://doi.org/10.1093/geronb/gbae146

Chen, Y., Wang, S., Senanu Ametefe, D., & John, D. (2024). Impact of Dancing on Physical and Mental Health: A Systematic Literature Review. *Dance Research, 42*(2), 220–256. https://doi.org/10.3366/drs.2024.0432

Connor, K. M., & Davidson, J. R. (2003). Development of a new resilience scale: the

Connor-Davidson Resilience Scale (CD-RISC). *Depression and anxiety, 18*(2), 76–82. https://doi.org/10.1002/da.10113

Craig, C. L., Marshall, A. L., Sjöström, M., Bauman, A. E., Booth, M. L., Ainsworth, B. E., Pratt, M., Ekelund, U., Yngve, A., Sallis, J. F., & Oja, P. (2003). International physical activity questionnaire: 12-country reliability and validity. *Medicine and science in sports and exercise, 35*(8), 1381–1395. https://doi.org/10.1249/01.MSS.0000078924.61453.FB

Delhom, I., Satorres, E., & Meléndez, J. C. (2020). Can we improve emotional skills in older adults? Emotional intelligence, life satisfaction, and resilience. *Psychosocial Intervention, 29*(3), 133–139.

Dharmansyah, D., & Budiana, D. (2021). Indonesian Adaptation of The International Physical Activity Questionnaire (IPAQ): Psychometric Properties.

Douka, S., Zilidou, V. I., Lilou, O., & Manou, V. (2019). Traditional Dance Improves the Physical Fitness and Well-Being of the Elderly. *Frontiers in aging neuroscience, 11,* 75. https://doi.org/10.3389/fnagi.2019.00075

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior research methods, 39*(2), 175–191. https://doi.org/10.3758/bf03193146

Faustino, B., & Fonseca, I. B. (2025). Exploring relationships between executive functions and maladaptive cyclical patterns in a transdiagnostic sample. *Applied neuropsychology. Adult, 32*(3), 675–683. https://doi.org/10.1080/23279095.2023.2204526

Fisher, G. G., Chaffee, D. S., & Sonnega, A. (2016). Retirement timing: A review and recommendations for future research. *Work, Aging and Retirement, 2*(2), 230–261. https://doi.org/10.1093/workar/waw001

Giebel, C., Shrestha, N., Reilly, S., White, R. G., Zuluaga, M. I., Saldarriaga, G., Liu, G., Allen, D., & Gabbay, M. (2022). Community-based mental health and well-being interventions for older adults in low- and middle-income countries: a systematic review and meta-analysis. *BMC geriatrics, 22*(1), 773. https://doi.org/10.1186/s12877-022-03453-1

Haywood, S., Garbett, K. M., Craddock, N., Hayes, C., Saraswati, L. A., Nasution, K., Medise, B. E., Vitoratou, S., & Diedrichs, P. C. (2024). Cultural adaptation and validation of the Positive and Negative Affect Schedule for Children (PANAS-C) among Indonesian adolescents. *BMC psychology, 12*(1), 703. https://doi.org/10.1186/s40359-024-02209-3

Hisan, U. K., Amri, M. M., Sulisworo, D., Rahmawati, I., & Pramesti, T. A. (2023). Google Trends Potential for Detecting a Large-scale Mental Health Issue: A Study during Pandemic in Indonesia. *Jurnal Aisyah: Jurnal Ilmu Kesehatan, 8*(2).

Hyvönen, K., Pylvänäinen, P., Muotka, J., & Lappalainen, R. (2020). The Effects of Dance Movement Therapy in the Treatment of Depression: A Multicenter, Randomized Controlled Trial in Finland. *Frontiers in psychology, 11,* 1687. https://doi.org/10.3389/fpsyg.2020.01687

Ingrand, I., Paccalin, M., Liuu, E., Gil, R., & Ingrand, P. (2018). Positive perception of aging is a key predictor of quality-of-life in aging people. *PloS One, 13*(10), e0204044.

Jeong, J., Yoo, E.-Y., Pryor, L., Kang, B.-H., & Ha, Y.-N. (2023). The Effects of a Tailored Activity Program for Dementia: A Systematic Review and Meta-Analysis. *Physical & Occupational Therapy In Geriatrics, 41(*2), 280–291. https://doi.org/10.1080/02703181.2022.2128972

Jiang, W. (2020). Depression and cardiovascular disorders in the elderly. *Clin Geriatr Med, 36(*2), 211–219.

Karkou, V., Aithal, S., Richards, M., Hiley, E., & Meekums, B. (2023). Dance movement therapy for dementia. *Cochrane Database of Systematic Reviews, (8).*

Karkou, V., Aithal, S., Zubala, A., & Meekums, B. (2019a). Effectiveness of dance movement therapy in the treatment of adults with depression: A systematic review with meta-analyses. *Frontiers in Psychology, 10,* 936.

Karkou, V., Aithal, S., Zubala, A., & Meekums, B. (2019b). Effectiveness of dance movement therapy in the treatment of adults with depression: A systematic review with meta-analyses. *Frontiers in Psychology, 10,* 936.

Katzmarzyk, P. T., Friedenreich, C., Shiroma, E. J., & Lee, I. M. (2022). Physical inactivity and non-communicable disease burden in low-income, middle-income and high-income countries. *British journal of sports medicine, 56*(2), 101–106. https://doi.org/10.1136/bjsports-2020-103640

Keadle, S. K., McKinnon, R., Graubard, B. I., & Troiano, R. P. (2016). Prevalence and trends in physical activity among older adults in the United States: A comparison across three national surveys. *Preventive medicine, 89*, 37–43. https://doi.org/10.1016/j.ypmed.2016.05.009

Koa, A. J. A. F., Chou, C. C., Lindayani, L., & Wang, C. J. (2024). Exploring barriers to physical activity participation among female nursing students adhering to specific social-cultural norms in Indonesia: A qualitative study. *Belitung nursing journal, 10(*4), 438–447. https://doi.org/10.33546/bnj.3370

Kong, L. N., Zhang, N., Yuan, C., Yu, Z. Y., Yuan, W., & Zhang, G. L. (2021). Relationship of social support and health-related quality of life among migrant older adults: The mediating

role of psychological resilience. *Geriatric nursing (New York, N.Y.), 42*(1), 1–7. https://doi.org/10.1016/j.gerinurse.2020.10.019

Kusuma, D., & Priyanti, A. (2020). Adaptation of traditional Sundanese dance for physical therapy in elderly populations. *Asian Journal of Aging Research, 9*(1), 35–49.

Lee, C., & Zhong, S. (2019). Age-friendly communities: Community environments to promote active ageing in place.Urban Environments for Healthy Ageing (pp. 147–172). Routledge.

Luo, J., Zhu, H. Q., Gou, B., & Zheng, Y. L. (2022). Mechanisms of exercise for diabetic neuropathic pain. *Frontiers in aging neuroscience, 14,* 975453. https://doi.org/10.3389/fnagi.2022.975453

MacLeod, S., Musich, S., Hawkins, K., Alsgaard, K., & Wicker, E. R. (2016). The impact of resilience among older adults. *Geriatric nursing (New York, N.Y.), 37*(4), 266–272. https://doi.org/10.1016/j.gerinurse.2016.02.014

Sujarwoto, & Maharani, A. (2022). Participation in community-based healthcare interventions and non-communicable diseases early detection of general population in Indonesia. *SSM - population health, 19,* 101236. https://doi.org/10.1016/j.ssmph.2022.101236

Millman, L. S. M., Terhune, D. B., Hunter, E. C. M., & Orgs, G. (2021). Towards a neurocognitive approach to dance movement therapy for mental health: A systematic review. *Clinical psychology & psychotherapy, 28*(1), 24–38. https://doi.org/10.1002/cpp.2490

Ministry of Health of the Republic of Indonesia. (2021). Health statistics: Profil kesehatan Indonesia tahun 2020. Ministry of Health of the Republic of Indonesia.

Mitchell, E., & Walker, R. (2020). Global ageing: successes, challenges and opportunities. *British journal of hospital medicine (London, England : 2005), 81*(2), 1–9. https://doi.org/10.12968/hmed.2019.0377

Murillo-Garcia, A., Villafaina, S., Collado-Mateo, D., Leon-Llamas, J. L., & Gusi, N. (2021). Effect of dance therapies on motor-cognitive dual-task performance in middle-aged and older adults: a systematic review and meta-analysis. *Disability and rehabilitation, 43*(22), 3147–3158. https://doi.org/10.1080/09638288.2020.1735537

Ngandu, T., Lehtisalo, J., Solomon, A., Levälahti, E., Ahtiluoto, S., Antikainen, R., Bäckman, L., Hänninen, T., Jula, A., Laatikainen, T., Lindström, J., Mangialasche, F., Paajanen, T., Pajala, S., Peltonen, M., Rauramaa, R., Stigsdotter-Neely, A., Strandberg, T., Tuomilehto, J., Soininen, H., … Kivipelto, M. (2015). A 2 year multidomain intervention of diet, exercise, cognitive training, and vascular risk monitoring versus control to prevent cognitive decline in at-risk elderly people (FINGER): a randomised controlled trial. *Lancet (London, England), 385*(9984), 2255–2263. https://doi.org/10.1016/S0140-6736(15)60461-5

Ningsih, E. S. P., Yusuf, A., Firdaus, S., Ilmi, B., Fitryasari, R., Sriyono, & Setyowati, A. (2022). Psychometric properties of the Indonesia version religious health fatalism questionnaire in diabetic foot ulcer outpatients. *Journal of public health research, 11*(3), 22799036221106605. https://doi.org/10.1177/22799036221106605

Porter, K. E., Brennan-Ing, M., Burr, J. A., Dugan, E., & Karpiak, S. E. (2017). Stigma and psychological well-being among older adults with HIV: The impact of spirituality and integrative health approaches. *The Gerontologist, 57*(2), 219–228.

Rahapsari, S. (2017). A Thematic Analysis of Interviews with the Southeast Asian Refugees: Understanding Resilience with Implications for Dance/Movement Therapy Support. Drexel University.

Rahmawati, A. N., Subiyantoro, S., & Widiyastuti, E. (2020). The Role of Art Education Through the Learning of Traditional Dance in Elementary School. 4th International Conference on Arts Language and Culture (ICALC 2019), 8–14. Atlantis Press. http://doi.org/10.2991/assehr.k.200323.002

Rebelo-Marques, A., De Sousa Lages, A., Andrade, R., Ribeiro, C. F., Mota-Pinto, A., Carrilho, F., & Espregueira-Mendes, J. (2018). Aging Hallmarks: The Benefits of Physical Exercise. *Frontiers in endocrinology, 9,* 258. https://doi.org/10.3389/fendo.2018.00258

Sampath, H., Soohinda, G. (2023). The Societal Impact and Feasibility of Psychosocial Interventions on the Quality of Life of the Elderly. In: Lama, P. (eds) The Ageing Population. Springer, Singapore. https://doi.org/10.1007/978-981-99-5772-9_3

Sánchez-González, D., Rojo-Pérez, F., Rodríguez-Rodríguez, V., & Fernández-Mayoralas, G. (2020). Environmental and Psychosocial Interventions in Age-Friendly Communities and Active Ageing: A Systematic Review. *International journal of environmental research and public health, 17*(22), 8305. https://doi.org/10.3390/ijerph17228305

Sathian, B., van Teijlingen, E., Simkhada, P., Kabir, R., & Al Hamad, H. (2024). Editorial: Evidence-based approaches in aging and public health. *Frontiers in public health, 12*, 1391432. https://doi.org/10.3389/fpubh.2024.1391432

Shao, M., Lin, X., Jiang, D., Tian, H., Xu, Y., Wang, L., Ji, F., Zhou, C., Song, X., & Zhuo, C. (2020). Depression and cardiovascular disease: Shared molecular mechanisms and clinical implications. *Psychiatry research, 285,* 112802. https://doi.org/10.1016/j.psychres.2020.112802

Sheppard, A., & Broughton, M. C. (2020). Promoting wellbeing and health through active

participation in music and dance: a systematic review. *International journal of qualitative studies on health and well-being, 15*(1), 1732526. https://doi.org/10.1080/17482631.2020.1732526

Sims-Gould, J., Franke, T., Lusina-Furst, S., & McKay, H. A. (2019). Community health promotion programs for older adults: What helps and hinders implementation. *Health science reports, 3*(1), e144. https://doi.org/10.1002/hsr2.144

Smith, M. L., Bergeron, C. D., McCord, C. E., Hochhalter, A. K., & Ory, M. G. (2018). Successful aging and resilience: applications for public health, health care, and policy. *Resilience in Aging: Concepts, Research, and Outcomes*, 17–33. https://doi.org/10.1007/978-3-030-04555-5_2

Syaukani, A. A., Jariono, G., Susanto, N., & Setyawan, H. (2024). Perception on health and exercise among indonesian older adults: a sequential exploratory study in javanese rural communities. *Retos: Nuevas Tendencias En Educación Física, Deporte y Recreación, (59),* 156–164.

Utomo, A., Mcdonald, P., Utomo, I., Cahyadi, N., & Sparrow, R. (2019). Social engagement and the elderly in rural Indonesia. *Social science & medicine (1982), 229*, 22–31. https://doi.org/10.1016/j.socscimed.2018.05.009

WHO. (2020). WHO guidelines on physical activity and sedentary behaviour. Geneva: WHO. Available at https://www.who.int/publications/i/item/9789240015128

WHO. (2021). Decade of healthy ageing: baseline report. Geneva: WHO. Available at Decade of healthy ageing: baseline report.

Windle, G., Bennett, K. M., & Noyes, J. (2011). A methodological review of resilience measurement scales. *Health and quality of life outcomes, 9*, 8. https://doi.org/10.1186/1477-7525-9-8.

Wu, Y. C., Shen, S. F., Lee, S. Y., Chen, L. K., & Tung, H. H. (2023). The effectiveness of mind-body approaches for enhancing resilience in older adults: A systematic review and network meta-analysis. *Archives of gerontology and geriatrics, 109,* 104949. https://doi.org/10.1016/j.archger.2023.104949.

Zheng, W., Huang, Y., & Fu, Y. (2020). Mediating effects of psychological resilience on life satisfaction among older adults: A cross-sectional study in China. *Health & social care in the community, 28*(4), 1323–1332. https://doi.org/10.1111/hsc.12965.

Zhu, Y., Gu, X., & Xu, C. (2020). Effectiveness of telemedicine systems for adults with heart failure: a meta-analysis of randomized controlled trials. *Heart failure reviews, 25*(2), 231–243. https://doi.org/10.1007/s10741-019-09801-5