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Mapping Fifty Years of Music Therapy Research: Trends, Themes, and Future Pathways through a Comprehensive Bibliometric Lens

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Abstract
This study presents a longitudinal bibliometric analysis of music therapy research spanning 1970 to 2025, utilizing Web of Science data to systematically map publication growth, citation dynamics, thematic evolution, and global collaboration patterns. The analysis, based on 4,454 peer-reviewed English articles, reveals an exponential expansion in research output from under 50 publications per year in the early decades to over 400 by 2023, with a contemporaneous decline in recent years likely due to database artefacts. Employing advanced science-mapping tools, the study identifies central clinical engines, anxiety, depression, pain, cancer, dementia, stroke, and child and adolescent mental health, alongside niche and emerging areas like preterm infant care, autism, and technology-mediated interventions (telehealth, virtual reality). A concentrated authorship and institutional landscape, dominated by Western, Anglophone countries, highlights persistent geographic inequities. Thematic mapping demonstrates a shift from foundational clinical research to diversified, interdisciplinary, and technology-driven domains, with telehealth and digital innovation accelerated post-COVID-19. The findings underscore the need for expanded global participation, rigorous evaluation of emerging interventions, and strategic investment to redress disparities, and they frame actionable implications for researchers, clinicians, and policymakers invested in a robust and inclusive music therapy future.
Keywords: Music Therapy, Bibliometric Analysis, Thematic Evolution, Telehealth, Global Collaboration

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DIALOGUE SOCIAL SCIENCE REVIEW

Introduction

Music therapy is widely defined as the clinical and evidence-based use of music interventions to accomplish individualized goals within a therapeutic relationship, delivered by a trained, credentialed professional (American Music Therapy Association [AMTA], 2005). The World Federation of Music Therapy (WFMT) emphasizes that practice, research, and training are embedded in specific cultural and social contexts and that music therapy engages clients in musical experiences to promote health, communication, and well-being (World Federation of Music Therapy [WFMT], 2011). Over the last five decades, the field has expanded rapidly, both clinically and scientifically. Music therapists now work across mental health, oncology, neurology, pediatrics, geriatrics, and community settings, supported by an increasingly robust empirical base. Parallel to this growth, bibliometric methods have emerged as powerful tools for mapping and evaluating scientific domains. Bibliometric analysis uses publication and citation data to examine trends in scientific production, impact, collaboration, and thematic structures (Donthu et al., 2021). Tools such as bibliometrix in R (Aria & Cuccurullo, 2017) now enable researchers to quantify annual scientific output, identify influential authors and institutions, and explore thematic evolution via co-citation and co-word networks.

In music therapy, high-quality evidence has accumulated in key clinical domains. Cochrane reviews have synthesized randomized trials for depression (Aalbers et al., 2017), cancer-related symptoms (Bradt et al., 2016), preoperative anxiety (Bradt et al., 2013), dementia (van der Steen et al., 2018), and autism spectrum disorder (Geretsegger et al., 2014), among others. In parallel, neurologic music therapy has demonstrated neurobiological mechanisms underlying rhythmic and melodic interventions for movement and cognitive disorders (Thaut & Abiru, 2010; Thaut et al., 2015). More recently, research has explored telehealth, virtual reality, and other technology-mediated formats, especially during and after the COVID-19 pandemic (Clements-Cortés et al., 2025). Despite this proliferation of studies, only a limited number of bibliometric investigations have systematically mapped the music therapy literature. A recent analysis of 1,004 Web of Science records from 2000-2019 documented steady growth in publications, identified leading authors such as Silverman and Baker, and highlighted the dominant role of institutions like the University of Melbourne and countries such as the United States (Li et al., 2021). However, that work did not cover the earlier decades of the field, nor did it fully incorporate post-2019 developments, including the COVID-19 related surge of telehealth and technology-based music therapy research.

The present study responds to this gap by proposing a comprehensive bibliometric analysis of music therapy publications indexed between 1970 and 2025. Building on state-of-the-art bibliometric methods, it will examine (a) the long-term trajectory of scientific production and citation impact; (b) patterns of authorship, institutional and national contributions, and collaboration; and (c) the thematic structure of the field, including established, niche, and emerging research fronts such as anxiety, depression, dementia, pediatric populations, cancer, stroke, autism, preterm infants, virtual reality, telehealth, and COVID-19.

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DIALOGUE SOCIAL SCIENCE REVIEW
Vol. 3 No. 11 (November) (2025)

These aims are particularly timely given preliminary evidence of a sharp apparent decline in recorded output after 2023 and a reduction in average citations per year for more recent articles, patterns that may reflect both substantive shifts in the field and database or citation-window artefacts.

Literature Review

Over the past decades, controlled trials and systematic reviews have documented beneficial effects of music therapy across a range of conditions. In mental health, the Cochrane review by Aalbers et al. (2017) concluded that, compared with treatment as usual or psychological therapies alone, music therapy can reduce depressive symptoms and improve functioning when delivered by trained therapists and integrated into multidisciplinary care. In oncology, Bradt et al. (2016) synthesized trials of music interventions for cancer patients and found evidence for reductions in anxiety and pain, improvements in quality of life, and physiological benefits such as lowered heart rate and blood pressure.

Perioperative contexts have also been an important focus. Bradt et al. (2013) reported that music interventions can significantly reduce preoperative anxiety and postoperative pain across various surgical populations, including dental, orthopedic, and cardiac procedures. Thematically, this resonates with the frequent appearance of keywords such as anxiety, pain, and surgery in music therapy bibliometric maps, suggesting that perioperative anxiety and pain management constitute a motor theme, highly developed and central to the field. In gerontology and dementia care, van der Steen et al. (2018) reviewed music-based therapeutic interventions for people living with dementia and reported positive effects on behavioral and psychological symptoms, including agitation and mood, though they emphasized heterogeneity in interventions and outcome measures. These findings align with the prominence of dementia, agitation, care homes, and quality of life as recurring keywords in music therapy publications, indicating a mature but methodologically complex research cluster.

Pediatric and developmental populations constitute another major line of inquiry. Loewy et al. (2013) demonstrated that live, individualized music therapy for premature infants in neonatal intensive care units can stabilize physiological parameters and support feeding and sleep, with potential benefits for parent–infant bonding. In autism spectrum disorder, the Cochrane review by Geretsegger et al. (2014) found that music therapy may improve social interaction, nonverbal communication, and parent–child relationships, though they called for more rigorous and longer-term studies. Keywords such as children, autism, and preterm infants thus represent a strong cluster at the intersection of developmental and family-focused music therapy, some aspects of which may be classified as niche or basic themes depending on their centrality to the overall network.

Neurologic and rehabilitation applications of music therapy further illustrate the field's breadth. Thaut and Abiru (2010) reviewed rhythmic auditory stimulation (RAS) for movement disorders and provided neurophysiological evidence that rhythmic cues can entrain motor timing and improve gait and coordination in stroke and Parkinson's disease. Thaut et al. (2015) subsequently elaborated the neurobiological foundations of neurologic music therapy, emphasizing auditory–motor coupling, neuroplasticity, and temporal prediction as mechanisms for therapeutic change. These lines of work underpin frequent bibliometric keywords such as stroke, Parkinson's disease, gait, and

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rehabilitation, and suggest that neurologic music therapy constitutes a core, motor theme with strong conceptual integration and high rate of citation.

Emerging Technologies: Virtual Reality, Telehealth, and COVID-19

In the last decade, and especially during the COVID-19 pandemic, music therapy has increasingly intersected with digital technologies such as telehealth and virtual reality. Surveys indicate that many music therapists shifted at least part of their caseloads to telepractice during the pandemic, using videoconferencing platforms to deliver live sessions and asynchronous interventions (Clements-Cortés et al., 2025; Wilhelm & Wilhelm, 2022). Neurologic music therapy services, in particular, were adapted for remote delivery, with clinicians reporting both increased accessibility for some clients and challenges related to sound quality, latency, and family involvement (Cole et al., 2021).

Music therapists and clinicians rapidly adapted to virtual formats, using synchronous video calls, personalized playlists, and tele-neurological music therapy, to support older adults, people with dementia, and neurological patients facing isolation, with studies reporting high feasibility, strong participant acceptability, and improvements in emotional state, loneliness, enjoyment, and everyday functioning (Bonakdarpour et al., 2021; Garrido et al., 2023; Kantorová et al., 2021). However, these interventions are typically small-scale, often constrained by low statistical power, technical difficulties, and the challenge of building rapport online, and they rarely include control groups or long-term follow-up (Haddad et al., 2024; Kher et al., 2022; Kumar et al., 2022). Together, this evidence suggests that personalized, telehealth-delivered music and psychosocial interventions are both feasible and potentially beneficial.

Virtual reality (VR) has also gained attention as both a complementary technology and a research topic in its own right. Trials in dentistry and burn care show that VR and music therapy, individually and in combination, can reduce pain and anxiety during invasive procedures (Zhang et al., 2024). More broadly, VR has been proposed as a powerful distraction and exposure tool that can integrate musical and multisensory stimuli to modulate emotional states, including anxiety and depressive symptoms (Chirico et al., 2020; Ioannou et al., 2020). From a bibliometric perspective, these technology-related topics are likely to be identified as emerging or “motor in transition” themes, areas with rapidly growing interest but still consolidating theoretical and methodological foundations. Their time-sliced co-occurrence patterns with more established keywords such as anxiety, pain, and rehabilitation may reveal whether technology-mediated music therapy is becoming a central, cross-cutting theme or remains a specialized niche.

Existing Bibliometric Studies on Music Therapy

Compared to the sheer number of clinical music therapy studies, bibliometric analyses specifically focused on this field remain relatively scarce. The comprehensive study by Li et al. (2021) analyzed music therapy publications indexed in Web of Science from 2000 to 2019, using co-authorship, co-citation, and co-word techniques. Their results showed a marked increase in annual publications, particularly after 2010, with the United States, United Kingdom, Australia, and China as leading contributors. Authors such as Michael J. Silverman and Felicity A. Baker were identified as highly productive and influential, while the University of Melbourne and several European universities

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Vol. 3 No. 11 (November) (2025)

emerged as central institutional hubs.

Given that most bibliometric analyses in other domains extend over several decades to capture the full developmental trajectory of a field (Donthu et al., 2021), a long-range perspective on music therapy, starting in 1970 and extending through 2025, is warranted. Such a timeframe not only encompasses early clinical and experimental work but also allows assessment of how citation patterns change over time, including the common phenomenon whereby more recent articles have fewer average citations simply because they have had less time to be cited. This consideration becomes especially important when interpreting an apparent "drop" in citations after around 2015 or a sharp decline in recorded output after 2023, which may be partly attributable to database indexing delays, changes in search strategies, or shifts in journal coverage.

Finally, by integrating performance indicators (e.g., annual production, citations), structural indicators (e.g., co-authorship, institutional networks), and thematic indicators (e.g., keyword maps, thematic evolution), the planned study can generate a comprehensive "science map" of music therapy. This map can inform strategic decisions by researchers, practitioners, funders, and professional associations regarding under-researched populations or regions, potential for international collaboration, and promising future directions—such as rigorous evaluation of telehealth music therapy, integration of VR and other immersive technologies, and stronger attention to equity and inclusion in global research efforts. Guided by the above literature and the preliminary patterns observed in the bibliometric dataset for this project, the study addresses the following research questions:

1. How has the annual scientific production and citation pattern of music therapy research evolved from 1970 to 2025, and what might explain the sharp decline in recorded output after 2023 and the drop in average citations per year after around 2015?
2. What do the distributions of authors, affiliations, and countries reveal about collaboration patterns and global inequalities in music therapy research?
3. Based on the keyword analyses, thematic maps, and trend topics, which research themes can be classified as motor, basic, niche, and emerging/declining, and what future research directions do these patterns suggest for the field of music therapy?

Method

Research Design

The present study employed a bibliometric research design to examine the intellectual, thematic, and structural evolution of music therapy scholarship from 1970 to 2026. Bibliometric analysis was selected because it enables a comprehensive and quantitative assessment of publication patterns, citation structures, authorship characteristics, thematic concentrations, and collaborative networks within a field. This methodological approach aligns with established standards in science mapping and scholarly evaluation, which recommend integrating citation analysis, co-word analysis, co-authorship mapping, thematic evolution, and structural clustering to provide a multi-dimensional understanding of research development (Donthu et al., 2021; van Eck & Waltman, 2017).

Data Source

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DIALOGUE SOCIAL SCIENCE REVIEW
Vol. 3 No. 11 (November) (2025)

All bibliographic data were retrieved from the Web of Science (WoS) Core Collection, chosen for its stringent indexing practices and broad coverage across the sciences, social sciences, and arts. WoS is considered one of the most reliable databases for bibliometric research due to its transparent curation of high-impact journals and its long-term archival structure, which is essential for longitudinal analyses (Mongeon & Paul-Hus, 2016).

Search Strategy and Data Refinement

A topic search was performed using the terms "music therapy," "music-therapy," "music based intervention*," and "music intervention*" within titles, abstracts, author keywords, and Keywords Plus fields. This search yielded 7,714 records. To ensure consistency and comparability, the dataset was refined to include only English-language, peer-reviewed journal articles. After excluding documents such as book chapters, conference papers, and early access items, and after removing duplicates, a final dataset of 4,454 documents was retained, representing 1,294 sources, 13,428 authors, 121,366 cited references, and showing an average of 4.03 co-authors per article with an international co-authorship rate of 16.26% .

Data Cleaning and Preparation

Following data extraction, all records were exported in BibTeX and CSV formats for cross-platform analysis. Data cleaning involved standardizing author names to prevent identity fragmentation, unifying synonymous keywords such as "music therapy," "music-therapy," and "music based intervention," and verifying journal titles to avoid misclassification across sources. These steps were essential for ensuring internal validity and analytic reliability, as recommended in bibliometric methodology literature (Aria & Cuccurullo, 2017).

Analytical Tools

Data analysis was conducted using Bibliometrix/Biblioshiny (R environment), which is the most widely used tool for advanced science mapping. Bibliometrix provided descriptive indicators, including annual scientific production, citation patterns, most relevant journals, most productive authors, institutional contributions, and country-level scientific output. These analyses produced the annual publication trends and citation curves that illustrate the expansion of music therapy research from fewer than 50 articles per year in early decades to over 400 by 2023, as well as the citation fluctuations explained by citation lag in recent years.

Reliability and Ethical Considerations

The reliability of the methodology was ensured through cross-validation between software platforms, careful data cleaning, and adherence to established bibliometric standards (Donthu et al., 2021). No primary human subjects were involved, and the study relied solely on publicly accessible bibliographic metadata, eliminating the need for ethical approval. The integration of descriptive metrics with structural and thematic mapping provides a comprehensive and multi-layered understanding of how music therapy research has evolved and diversified over five decades.

Results

The bibliometric analysis of music therapy research, based on data retrieved

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www.thedssr.com

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Vol. 3 No. 11 (November) (2025)

from the Web of Science Core Collection, yielded 4,454 documents after refining the initial 7,714 topic-based results to include only articles in English, spanning the period from 1970 to 2026 across 1,294 sources. The dataset comprised 4,452 total documents, predominantly articles (4,294), with no contributions from book chapters, data papers, early access publications, proceedings papers, or retracted items. The average document age was 8.1 years, and the average number of citations per document was 15.29, supported by 121,366 references. Keyword analysis revealed 4,146 Keywords Plus and 7,678 authors' keywords, while authorship patterns indicated 13,428 authors, including 692 single-authored document creators, with 921 single-authored documents overall, an average of 4.03 co-authors per document, and 16.26% international co-authorships, highlighting a collaborative yet moderately global research landscape in the field.

The line graph (figure 1) illustrating annual scientific production in music therapy research reveals a slow initial growth phase from 1970 through the mid-1990s, where article output remained minimal and relatively stagnant below 50 publications per year, followed by a marked acceleration starting around 2000, escalating steadily to a peak of over 400 articles by approximately 2023. This upward trajectory reflects increasing scholarly interest and investment in the field, potentially driven by advancements in interdisciplinary applications and clinical validations. However, a precipitous drop is observed post-2023, plummeting toward near-zero output by 2026, which may attributable to data incompleteness for forthcoming years or pre-publication entries rather than an actual decline in research activity.

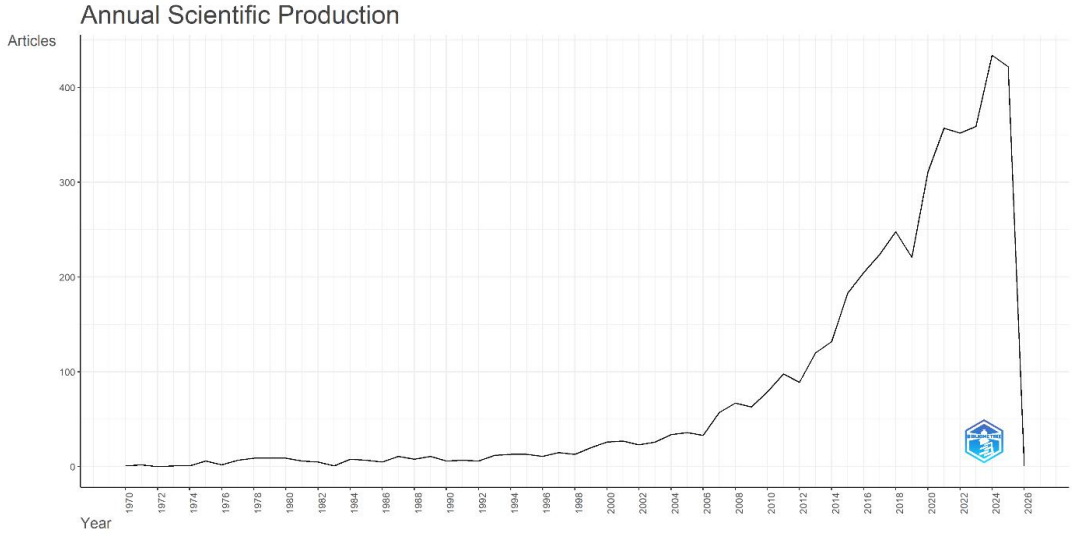

Figure 1. Annual Scientific Production

As illustrated in Figure 2, which depicts temporal trends in average citations per year for music therapy publications from 1970 to 2025, the citation activity starts with minimal and fluctuating values near zero until the mid-1980s, signifying the emerging nature of the discipline with sparse influential outputs. A significant escalation occurs from the late 1980s, reaching a zenith above 3 citations per year around 1997, likely attributable to foundational studies gaining traction amid expanding clinical and psychological integrations. Following this apex, the pattern shows irregular oscillations between 1 and 2.5 citations through the 2000s and early 2010s, succeeded by a consistent decline starting circa 2015, tapering to near-zero by 2025, possibly due to inherent citation delays for newer

Dialogue Social Science Review (DSSR)
www.thedssr.com

ISSN Online: 3007-3154
ISSN Print: 3007-3146
Vol. 3 No. 11 (November) (2025)

works, methodological evolutions, or broader shifts in citation practices within health-related interdisciplinary fields.

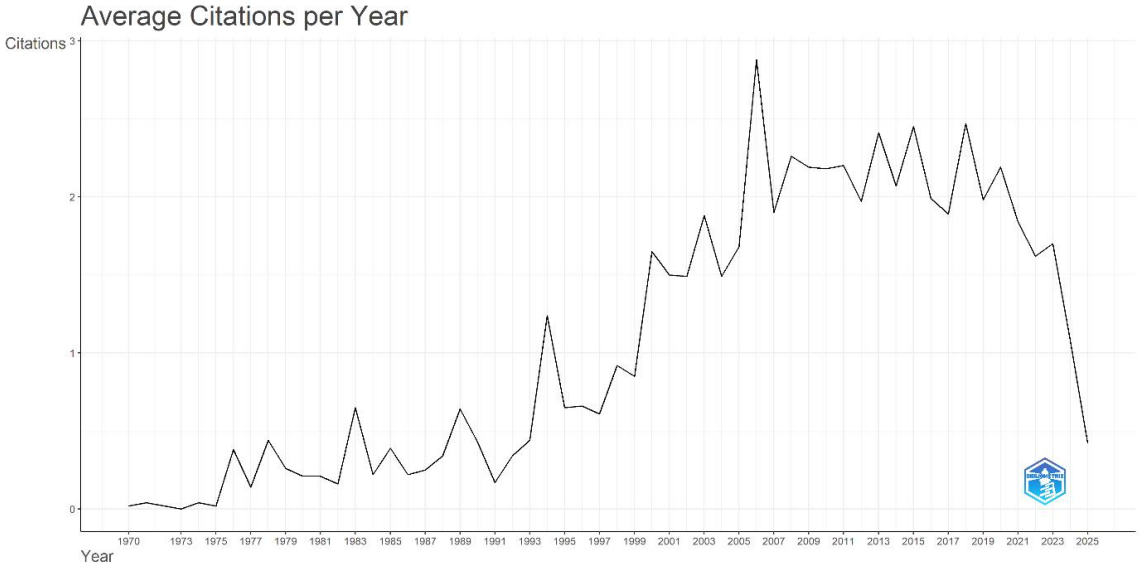

Figure 2. Average Citations per Year

As depicted in Figure 3, the three-field Sankey diagram reveals a centralized structure in music therapy scholarship, with "music therapy" emerging as the dominant keyword in the KW_Merged field, interconnected with related terms like "therapy," "music," and "music-therapy," underscoring its pivotal role in thematic cohesion. Prominent authors in the AU field, such as Silverman, Michael J., Baker, Felicity A., Tamplin, Jeanette, Gold, Christian, and Robb, Sheri L., exhibit strong linkages to this core keyword, while also branching into specialized applications including "depression," "dementia," "children," "anxiety," and "quality-of-life," indicating a collaborative network focused on clinical interventions for mental health and pediatric populations. The CR field highlights foundational cited references, particularly Bradt J's 2013 and 2016 Cochrane systematic reviews, which serve as key nodes connecting multiple authors and influencing research on evidence-based practices in conditions like depression and dementia.

Further analysis of Figure 3 demonstrates implicit pathways from cited references to keywords via authors, where works like Loewy J 2013 on pediatrics and Robb SL 2011 in health psychology reinforce themes in child and adolescent care, blending theoretical foundations from earlier texts such as Bruscia K.E.'s 1987 and 1998 publications with contemporary empirical studies. This visualization portrays a mature field characterized by a core group of influential researchers who prioritize systematic evidence synthesis, evident in the heavy reliance on Cochrane reviews, while integrating diverse clinical contexts like cancer rehabilitation, stress management, and pain intervention. Overall, the plot suggests opportunities for expanded international collaboration and deeper exploration of sub-themes, providing a roadmap for identifying leading contributors and evolving research priorities in music therapy.

Dialogue Social Science Review (DSSR)
www.thedssr.com

ISSN Online: 3007-3154
ISSN Print: 3007-3146
Vol. 3 No. 11 (November) (2025)

DIALOGUE SOCIAL SCIENCE REVIEW

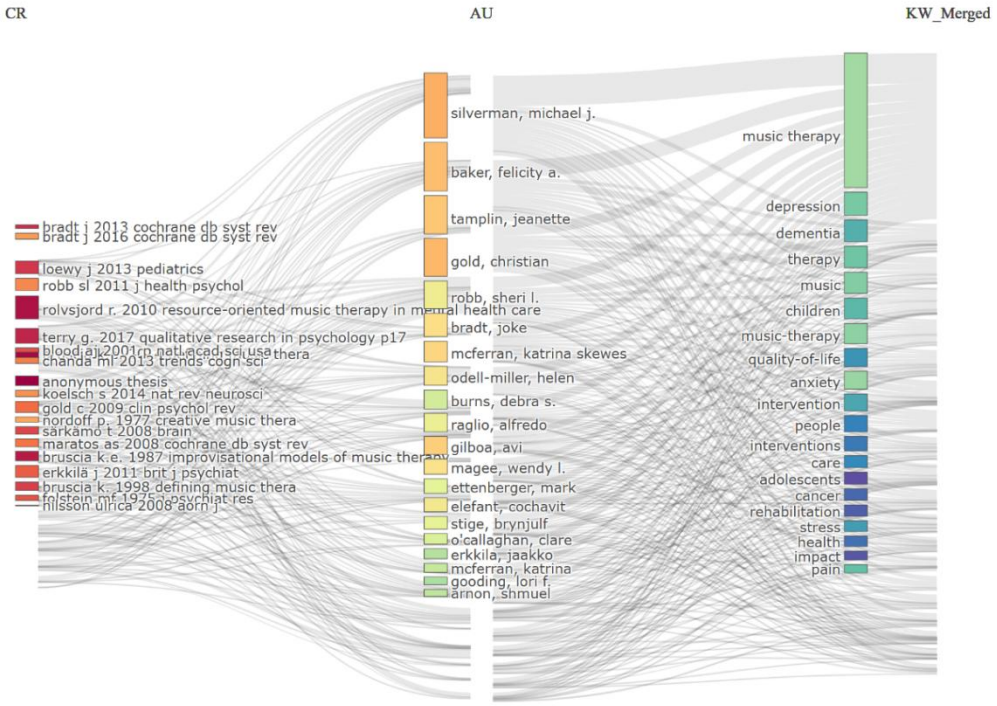

Figure 3. Three-Field Plot Illustrating Interconnection

As illustrated in Figure 4, which presents a horizontal bar chart of the most relevant sources in music therapy research based on the number of documents indexed in the Web of Science Core Collection, the Journal of Music Therapy emerges as the predominant outlet with 445 articles, significantly outpacing other publications and underscoring its foundational role in disseminating specialized empirical and clinical studies within the field. Following closely are the Arts in Psychotherapy with 288 documents and the Nordic Journal of Music Therapy with 284, both reflecting strong regional and interdisciplinary emphases on therapeutic arts integration and Scandinavian perspectives, respectively, while Music Therapy Perspectives contributes 226 articles, further highlighting dedicated platforms for practical applications and practitioner insights. The distribution tapers off with mid-tier journals like the British Journal of Music Therapy (81 documents) and Frontiers in Psychology (70), which bridge traditional music therapy with broader psychological research, alongside Psychology of Music (59) focusing on perceptual and cognitive aspects. Lower-ranking sources include Noise & Health (40), emphasizing auditory health implications; the International Journal of Environmental Research and Public Health (33), incorporating public health contexts; and Frontiers in Neuroscience (29), indicating emerging intersections with neuroscientific explorations, collectively portraying a concentrated yet diverse publishing landscape dominated by a few key journals that facilitate the field's growth through targeted, evidence-based contributions.

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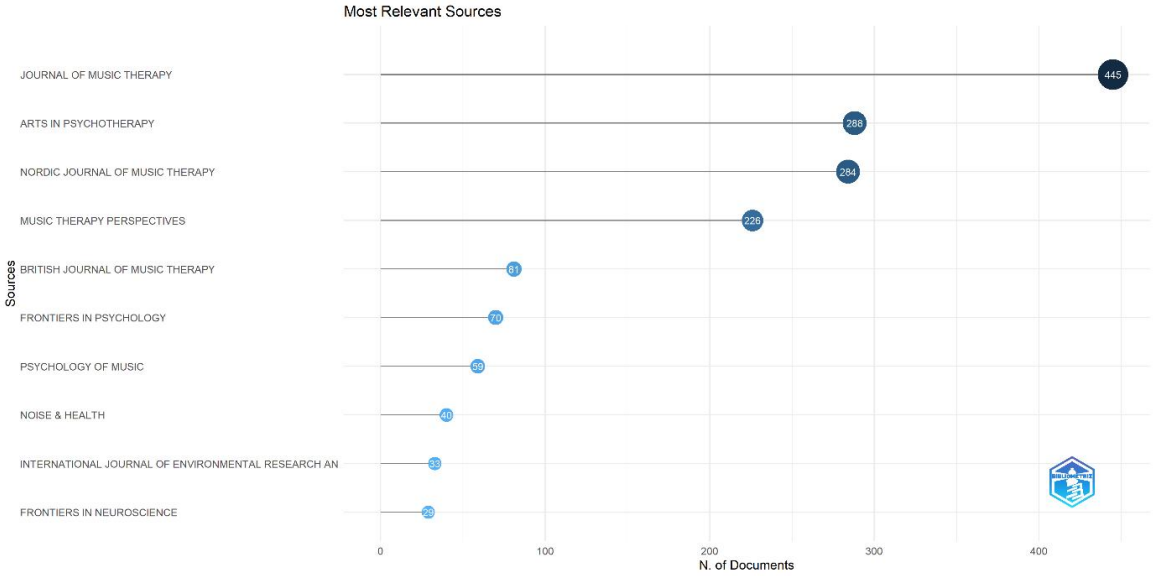

Figure 4. Most Relevant Sources

As illustrated in Figure 5, the line graph depicting cumulative occurrences of publications in prominent music therapy journals from 1970 to 2024 reveals distinct growth trajectories, with the Journal of Music Therapy (green line) demonstrating the most substantial accumulation, starting with negligible output in the early 1970s and accelerating sharply from the mid-1990s to surpass 400 documents by 2024, affirming its status as the field's primary dissemination venue. The Arts in Psychotherapy (red line) follows as the second most prolific, exhibiting a steady rise from the late 1980s to reach approximately 300 cumulative occurrences, reflecting its interdisciplinary appeal in therapeutic arts. The Nordic Journal of Music Therapy (purple line) shows a similar pattern but with a later onset of rapid growth around the 2000s, accumulating over 250 documents, indicative of regional specialization in Scandinavian approaches. Music Therapy Perspectives (blue line) maintains a moderate upward trend from the 1980s, nearing 200 by the end, emphasizing practical and perspective-oriented content, while the British Journal of Music Therapy (yellow line) displays the slowest progression, with a gradual increase post-1990s to about 100 cumulative occurrences, suggesting a more niche or emerging role within the UK context. Overall, the graph highlights an exponential field-wide expansion in scholarly output since the 1990s, driven by these core journals, potentially correlating with increased professionalization, funding, and global interest in music therapy applications.

Dialogue Social Science Review (DSSR)
www.thedssr.com

ISSN Online: 3007-3154
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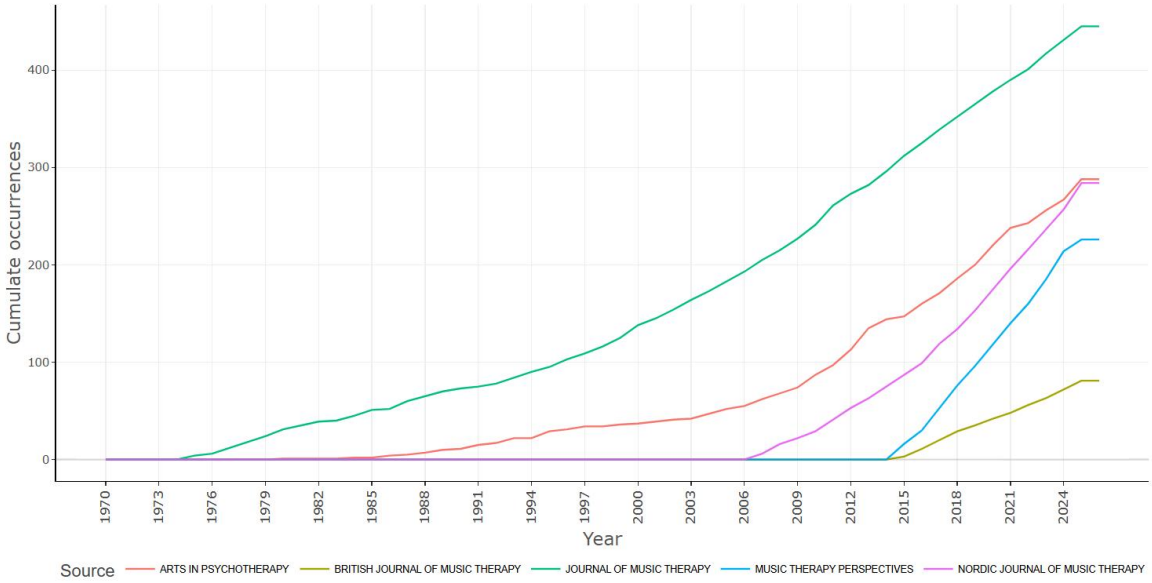

Figure 5. Cumulative Publication Trends

As illustrated in Figure 6, the horizontal bar chart delineates the top ten authors in music therapy scholarship based on publication volume, with Silverman, Michael J. leading substantially at 104 documents, reflecting his prolific output and central influence in advancing clinical and empirical studies within the discipline. Following him, Gold, Christian ranks second with 63 articles, emphasizing contributions likely in evidence-based therapeutic models, while Baker, Felicity A. holds third place with 58 documents, potentially focusing on interdisciplinary applications in mental health. Mid-tier productivity is evident in Tamplin, Jeanette (40 articles), Gilboa, Avi (31), and McFerran, Katrina Skewes (31), the latter two tying and underscoring specialized research in areas such as pediatric or adolescent interventions, succeeded by Bradt, Joke (30), Magee, Wendy L. (29), Odell-Miller, Helen (28), and Elefant, Cochavit (26), who collectively represent a core cadre of experts driving thematic diversity from neurological to psychosocial contexts. Complementing the raw counts, the fractionalized article metrics—adjusting for co-authorship—reveal Silverman's adjusted productivity at 73.10, far exceeding others like Baker's 19.42 and McFerran's 14.03, while Gold's drops to 11.06, suggesting varying collaboration intensities and highlighting a field where individual leadership coexists with team-based efforts to foster comprehensive knowledge accumulation.

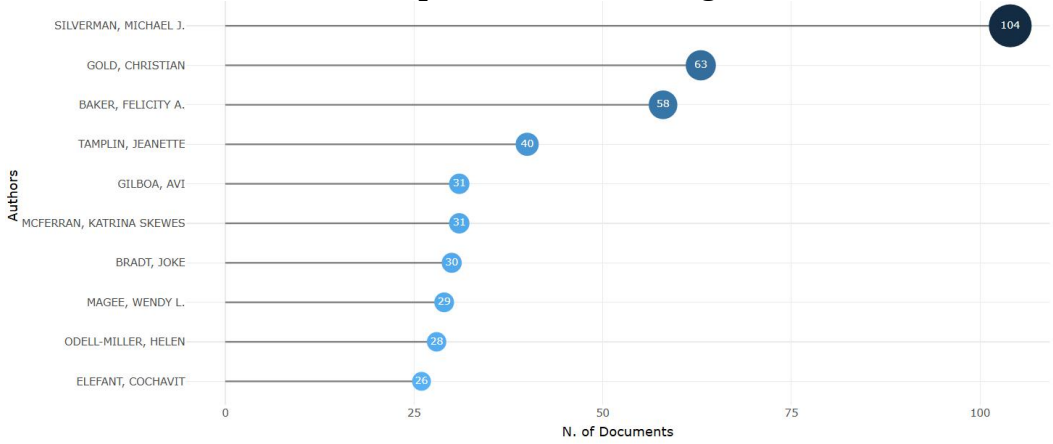

Figure 6: Most Productive Authors

Dialogue Social Science Review (DSSR)
www.thedssr.com

ISSN Online: 3007-3154
ISSN Print: 3007-3146
Vol. 3 No. 11 (November) (2025)

As illustrated in Figure 7, the timeline plot of authors' production over time in music therapy research from 2005 to 2025 visualizes scholarly output through horizontal red lines representing each researcher's active period, with bubbles indicating annual publications where size denotes the number of articles and color depth reflects total citations per year (TC/year), ranging from light (low impact) to dark blue (high impact). Leading author Silverman, Michael J., demonstrates the longest and most consistent trajectory with steady moderate-sized bubbles and moderate citation intensity, focusing on psychiatric and patient-preferred interventions, while Gold, Christian, exhibits peaks in productivity and impact around 2011, 2016, and 2017, driven by high-citation works on depression, preterm infants, and autism spectrum disorder via randomized trials and meta-analyses. Baker, Felicity A., and Tamplin, Jeanette, show aligned patterns of increasing output post-2014, with notable dark bubbles in 2018-2022 linked to dementia and depression studies in elderly care, including innovative virtual reality applications, whereas Gilboa, Avi, and McFerran, Katrina Skewes, maintain steady moderate contributions emphasizing dementia care and adolescent mental health prevention, respectively.

Further examination in Figure 7 highlights impactful spikes for Bradt, Joke, particularly in 2023 with an exceptionally dark, large bubble from oncology guidelines achieving 37.3 TC/year, underscoring her role in evidence synthesis and clinical standards, alongside Magee, Wendy L.'s consistent neurology-focused work with telehealth innovations peaking in 2022. Odell-Miller, Helen, and Elefant, Cochavit, display strong collaborative influences, sharing high-impact 2017 bubbles from a JAMA autism trial (11.9 TC/year), with Elefant extending to preterm infant family interventions in recent years. Overall, the plot reveals a dynamic field blending sustained productivity from veterans with "mega-impact" events from landmark trials and guidelines, reflecting specialization in mental health, neurology, and emerging areas like telehealth, while noting citation lags for recent outputs.

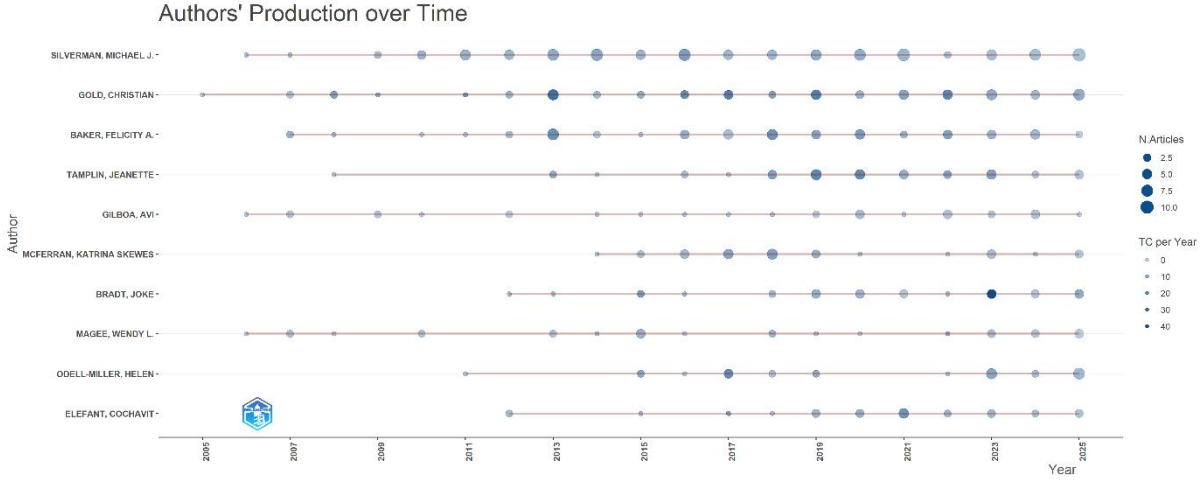

Figure 7. Authors' Production over time

As illustrated in Figure 8, the horizontal bar chart ranking the most relevant affiliations in music therapy research by article count showcases the University of Melbourne leading decisively with 285 publications, nearly double that of the next contenders, signifying its pivotal role as a global hub for advancing therapeutic music studies through extensive empirical and interdisciplinary efforts. Closely trailing are U.S.-based institutions like the University of

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Vol. 3 No. 11 (November) (2025)

Minnesota System (141 articles) and its Twin Cities campus (137), alongside the University of Bergen in Norway (140), reflecting strong North American and Scandinavian contributions to clinical trials and neurological applications. Mid-tier affiliations include the University of Toronto (128) in Canada, the State University System of Florida (121), and the University System of Ohio (118), emphasizing regional U.S. academic networks fostering research in mental health and rehabilitation contexts, while the University of London (100) in the UK, Aalborg University (98) in Denmark, and Indiana University System (91) in the U.S. round out the top ten, illustrating a geographically diverse yet predominantly Western institutional landscape that drives innovation through collaborative and specialized programs in this evolving field.

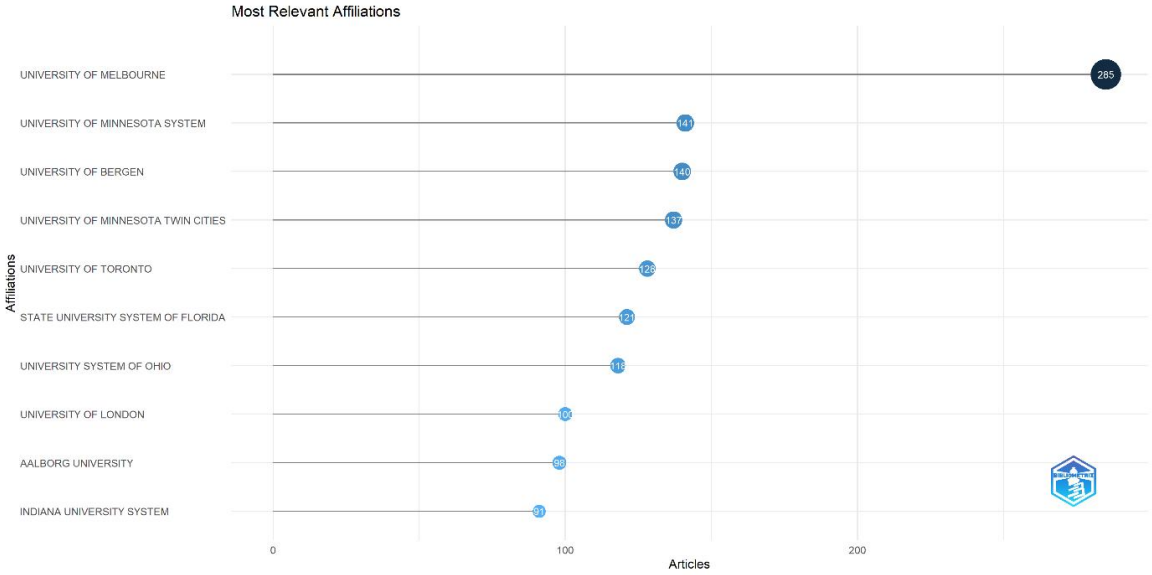

Figure 8. Most Relevant Affiliations

As illustrated in Figure 9, the choropleth world map depicting country scientific production in music therapy research highlights a pronounced concentration of scholarly output in select nations, with color intensity correlating to publication frequency, where the United States stands out in the deepest blue shade representing 3,186 documents, affirming its dominant position through robust institutional support and extensive clinical applications. China follows as the second major contributor with 1,416 articles, shaded in a medium blue, reflecting rapid growth in interdisciplinary health studies, while Australia (799) and the United Kingdom (780) exhibit lighter yet significant hues, underscoring strong regional emphases on therapeutic innovations in Oceania and Europe. European nations like Germany (532), Italy (521), and Norway (409) display moderate shades, indicating specialized contributions in neurological and mental health contexts, complemented by Canada's 383 publications in North America and emerging outputs from Iran (348) and Spain (296) in lighter tones, collectively portraying a predominantly Western and Northern hemispheric focus with increasing Asian involvement, though vast regions in Africa, South America, and parts of Asia remain gray, signifying minimal or absent documented research activity in this bibliometric dataset.

Dialogue Social Science Review (DSSR)
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Vol. 3 No. 11 (November) (2025)

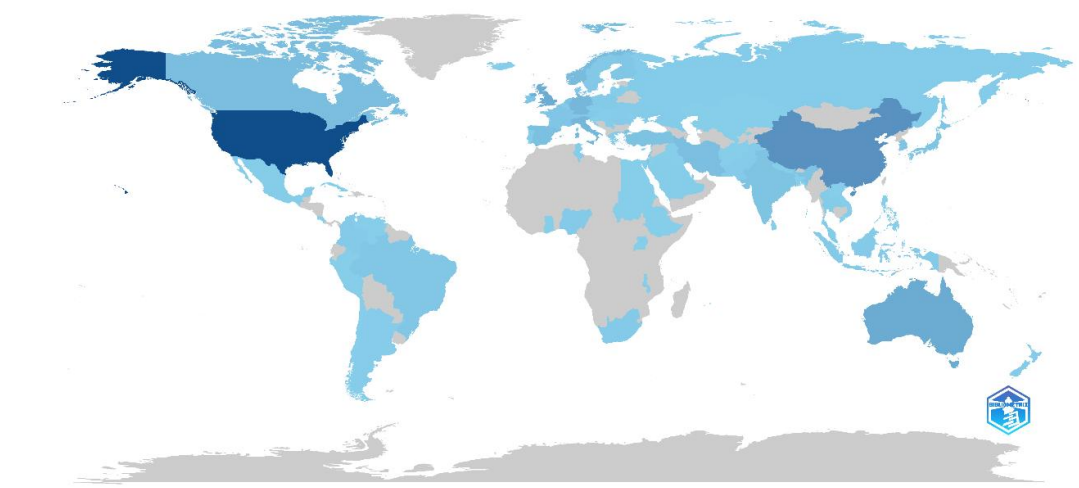

Figure 9. Country Scientific Production

As illustrated in Figure 10, the horizontal bar chart delineating the most globally cited documents in music therapy research identifies Livingstone and Russo's 2018 PLOS ONE publication on the Ryerson Audio-Visual Database of Emotional Speech and Song (RAVDESS) as the foremost with 855 citations (106.88 per year, 43.28 normalized), offering a validated multimodal resource of emotional expressions in speech and song that supports therapeutic advancements in neurological rehabilitation, mood disorders, and cognitive recovery. Subsequent high-impact works include Cohen's 2006 Gerontologist study (291 citations, 14.55 per year) examining cultural programs' effects on older adults' health; Lyman's 2018 Journal of Clinical Oncology article (286 citations, 35.75 per year) likely addressing integrative oncology; Pacchetti et al.'s 2000 Psychosomatic Medicine paper on active music therapy for Parkinson's disease (275 citations, 10.58 per year), revealing significant improvements in bradykinesia, emotional functions, and quality of life; and Loewy's 2013 Pediatrics research on music therapy's influence on premature infants' vital signs, feeding, and sleep (259 citations, 19.92 per year). Further notable entries encompass Guetin et al.'s 2009 Dementia and Geriatric Cognitive Disorders investigation into music therapy for reducing anxiety and depression in Alzheimer's patients (256 citations, 15.06 per year); Maccoon's 2012 Behavioral Research Therapy contribution (246 citations, 17.57 per year); Koelsch's 2009 Annals of the New York Academy of Sciences exploration of music-evoked emotions (230 citations, 13.53 per year); Robb et al.'s 2011 Journal of Health Psychology guidelines for reporting music-based interventions (225 citations, 15.00 per year); and Erkkila et al.'s 2011 British Journal of Psychiatry randomized trial on music therapy for depression (223 citations, 14.87 per year), collectively underscoring the field's emphasis on rigorous clinical evidence and interdisciplinary applications in mental health, geriatrics, and pediatrics.

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ISSN Print: 3007-3146
Vol. 3 No. 11 (November) (2025)

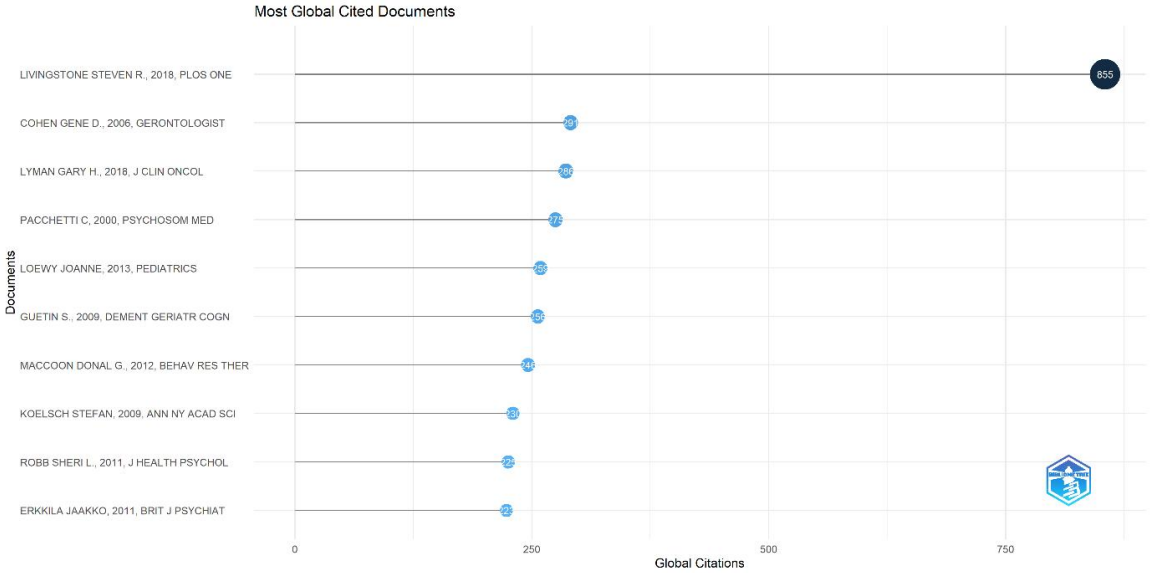

Figure 10. Most Global Cited Documents

As illustrated in Figure 11, the treemap of term frequencies in music therapy research visually represents occurrence rates through proportionally sized and colored rectangles, dominated by "music therapy" at 2076 instances (18%) in blue, followed by "anxiety" (698, 6%) in orange, "music-therapy" (646, 6%) in green, "music" (448, 4%) in red, "depression" (435, 4%) in purple, "therapy" (419, 4%) in brown, "pain" (388, 3%) in pink, "children" (366, 3%) in gray, "dementia" (360, 3%) in yellow, and "intervention" (341, 3%) in cyan, extending to mid-sized segments like "quality-of-life" (228, 2%), "care" (223, 2%), "people" (220, 2%), "health" (173, 1%), "adolescents" (160, 1%), "management" (137, 1%), "mental health" (137, 1%), "recovery" (128, 1%), "cancer" (170, 1%), "relaxation" (157, 1%), "scale" (123, 1%), "perception" (107, 1%), "quality" (106, 1%), "responses" (104, 1%), "adults" (119, 1%), "stroke" (100, 1%), "mood" (156, 1%), "rehabilitation" (168, 1%), "impact" (161, 1%), "symptoms" (149, 1%), "prevention" (112, 1%), "communication" (93, 1%), "validation" (93, 1%), "efficacy" (90, 1%), "disorders" (89, 1%), "brain" (92, 1%), "palliative care" (107, 1%), "life" (88, 1%), "outcomes" (52, 1%), "speech" (87, 1%), "performance" (89, 1%), and "autism" (1%), collectively delineating a hierarchical emphasis on therapeutic interventions for psychiatric, neurological, and developmental conditions across varied populations and outcomes.

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ISSN Online: 3007-3154
ISSN Print: 3007-3146
Vol. 3 No. 11 (November) (2025)

Figure 11. Treemap

As illustrated in Figure 12, the trend topics plot maps the evolution of dominant keywords in music therapy research from 1994 to 2024, with horizontal lines representing individual terms and bubble sizes indicating their median frequency among the top three per year, showcasing a gradual escalation in thematic diversity and research intensity, particularly accelerating post-2006. In the foundational phase (1994–2006), sparse activity centers on core assessments like "mini-mental state" and early explorations of physiological effects such as "immune-system," "cytokines," "patient anxiety," "background music," and "instruction," laying groundwork for mind-body connections. The mid-period (2006–2016) marks a shift toward clinical rigor, with expanding terms including "nursing-home residents," "vegetative state," "inpatients," "alzheimers-disease," "substance abuse," "rett syndrome," "massage therapy," "cognitive-behavioral therapy," "relaxation," "controlled-trial," "randomized controlled-trial," "relaxing music," and "songs written," signaling a focus on targeted populations, therapeutic modalities, and evidence-based methodologies. Recent years (2016–2024) exhibit peak dynamism, dominated by "music therapy," "music-based intervention," and "music-based interventions" with the largest bubbles around 2018–2020, alongside persistent emphases on outcomes like "anxiety," "stress," "pain," "recovery," and "quality of life," while incorporating modern elements such as "virtual reality," "telehealth," "covid-19," "qualitative study," "thematic analysis," and "art therapy," reflecting technological integration, pandemic responsiveness, and methodological broadening in an increasingly interdisciplinary domain.

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ISSN Online: 3007-3154
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Vol. 3 No. 11 (November) (2025)

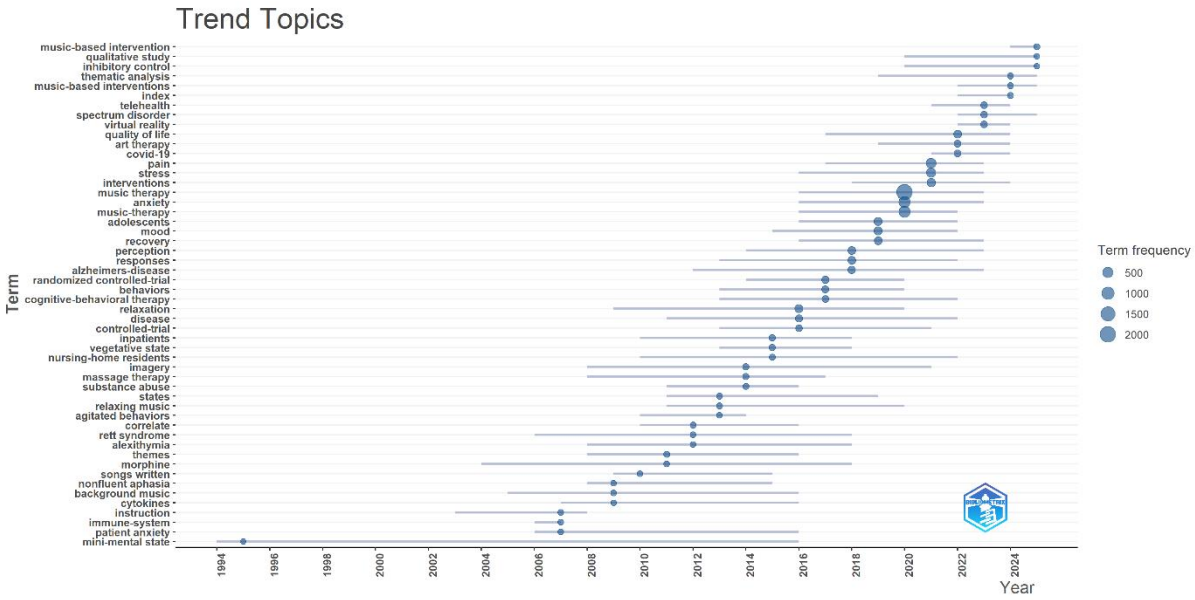

Figure 12. Trend Topics

As illustrated in Figure 13, the clusters by documents coupling plot in music therapy research delineates two primary thematic groups on a two-dimensional plane, with centrality along the x-axis reflecting the extent of external connections to other clusters and impact on the y-axis indicating internal coherence or density, visualized through colored bubbles sized by document frequency. The red cluster (group 1), comprising 113 documents with a centrality of 0.401 and impact of 1.061, occupies the upper-right quadrant, emphasizing integrated themes of "music therapy" (39.9% confidence), "mental health" (65%), and "music" (31.2%), suggesting a mature, influential subdomain with strong interdisciplinary linkages and high scholarly resonance in broader psychological contexts. In contrast, the blue cluster (group 2), with 137 documents, a slightly lower centrality of 0.399, and impact of 1.019, is positioned in the lower-left quadrant, focusing on "music therapy" (60.1%), "music" (68.8%), and "anxiety" (78.3%), indicating an emerging or peripheral theme centered on specific emotional interventions, potentially with untapped potential for greater integration and visibility within the field's evolving landscape.

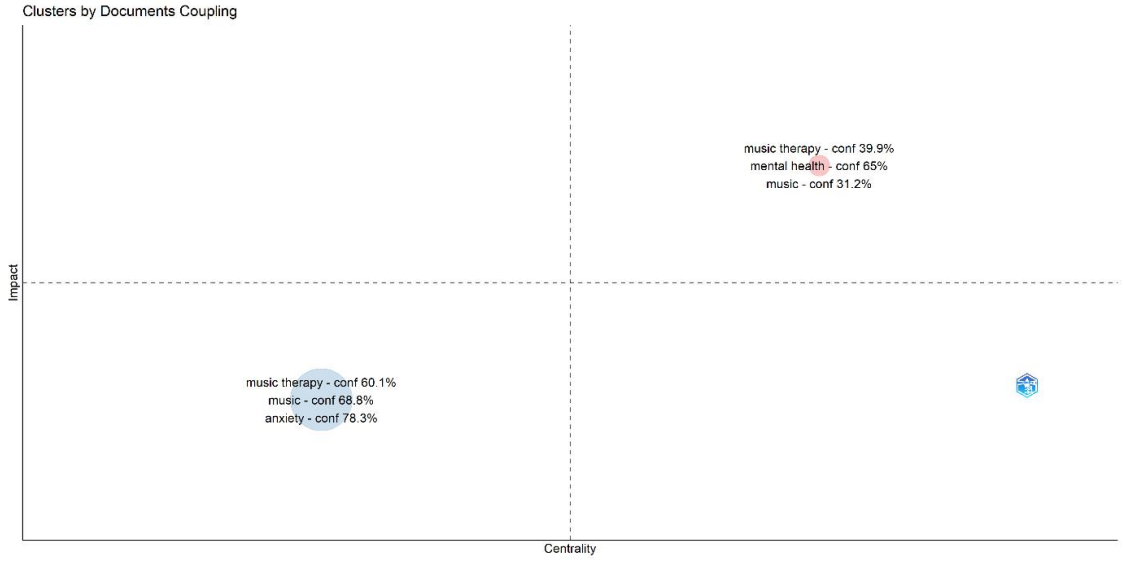

Figure 13. Clusters by Documents Coupling

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ISSN Print: 3007-3146
DIALOGUE SOCIAL SCIENCE REVIEW
Vol. 3 No. 11 (November) (2025)

As illustrated in Figure 14, the strategic thematic map of music therapy research clusters documents based on coupling, plotted along relevance degree (centrality) on the x-axis and development degree (density) on the y-axis, delineating four quadrants that categorize themes by their maturity and interconnectedness within the field. In the top-right motor themes quadrant, highly central and dense clusters include "children adolescents mental health" (red) and "anxiety pain cancer" (beige), representing well-established, influential areas with strong internal cohesion and broad linkages, driven by key articles on clinical psychology and symptom management. The top-left niche themes feature "rehabilitation stroke individuals" (orange), indicating specialized, cohesive research with limited external ties, anchored in neurological rehabilitation studies. Bottom-right basic themes encompass "music therapy music-therapy music" (blue) and "stress responses outcomes" (green), foundational concepts with high centrality but lower density, reflecting versatile applications across diverse contexts as evidenced by integrative and health psychology publications. Finally, the bottom-left emerging or declining themes include "preterm infants nicu premature-infants" (pink) and "communication autism autism spectrum disorder" (purple), suggesting nascent or specialized frontiers with low centrality and density, highlighted by recent works on neonatal care and music-based interventions for developmental disorders, overall portraying a dynamic field balancing core interventions with targeted clinical expansions.

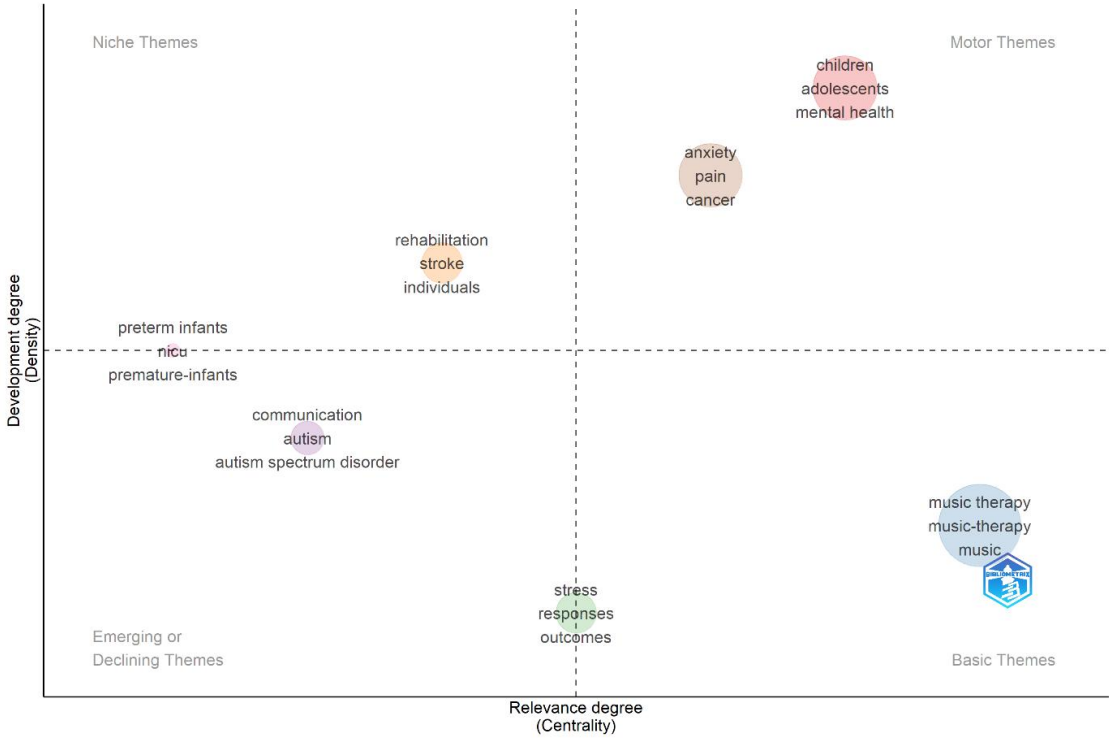

Figure 14. Thematic map

As illustrated in Figure 15, the country collaboration map in music therapy research integrates a choropleth representation of scientific production with overlaid brown lines depicting international partnerships, where color intensity correlates to publication output, positioning the United States as the preeminent hub in deep blue with the highest volume, serving as a central connector through dense, thick linkages to nearly all major contributors. Western Europe, including the United Kingdom, Germany, France, Netherlands, Italy, and Spain, forms a

Dialogue Social Science Review (DSSR)
www.thedssr.com

ISSN Online: 3007-3154
ISSN Print: 3007-3146
Vol. 3 No. 11 (November) (2025)

robust medium-dark blue cluster with intricate intra-regional and transatlantic connections to North America, particularly Canada (also medium-dark), underscoring longstanding collaborative synergies. East Asia and Oceania, notably China, Japan, South Korea, and Australia in similar shades, exhibit strong regional ties among themselves and extensive global extensions to the US and Europe, while emerging links reach Brazil, South Africa, and other lighter-shaded nations in South America and Africa, reflecting a Northern Hemisphere-dominated network with a hub-and-spoke structure that highlights disparities in output and integration, potentially influenced by Web of Science coverage biases toward English-language and Western scholarship.

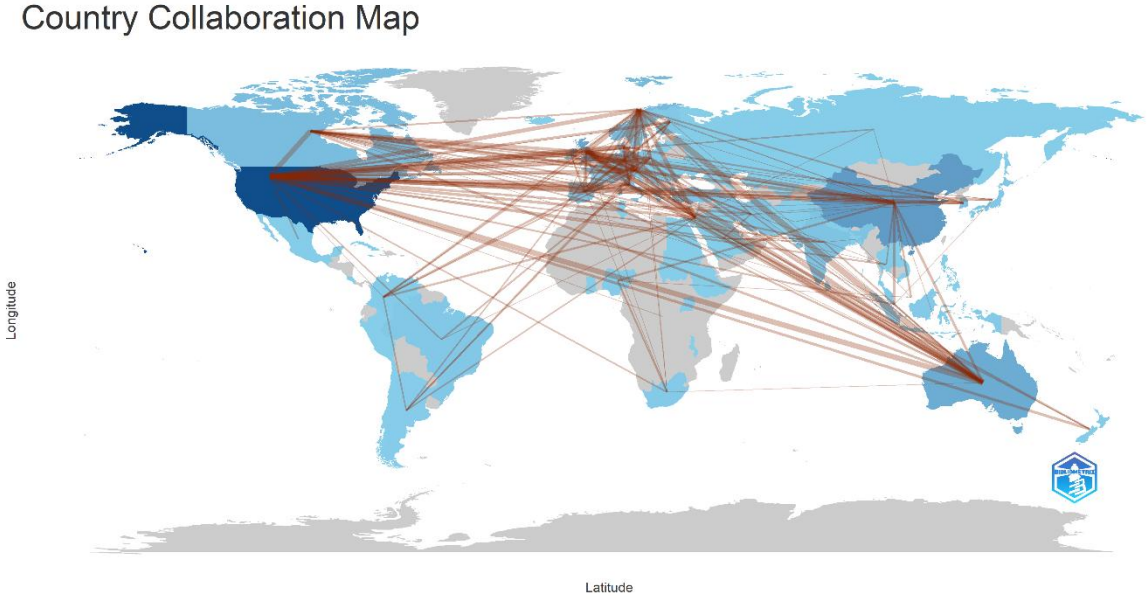

Figure 15. Country Collaboration Map

Discussion

This study provides the first long-range science map of music therapy research from 1970 to 2025, extending earlier bibliometric work that focused on shorter time windows and more restricted datasets (Li et al., 2021). By combining performance indicators, collaboration networks, and thematic mapping, it responds to calls for rigorous, transparent bibliometric analyses that trace how fields evolve conceptually, structurally, and geographically over time (Aria & Cuccurullo, 2017; Donthu et al., 2021). The findings position music therapy as a maturing interdisciplinary domain with consolidated clinical cores, persistent global inequities, and rapidly emerging technology-mediated frontiers.

Evolution of Scientific Production and Citations (RQ1)

The growth trajectory of music therapy publications suggests a transition from a small, experimental niche into a recognized, evidence-oriented field. Early decades are characterized by sparse output, consistent with a period in which music therapy was still fighting for legitimacy within medicine, psychology, and rehabilitation. The subsequent acceleration from the early 2000s mirrors the consolidation of specialized journals and the accumulation of systematic reviews and randomized trials documenting effects in depression, cancer, perioperative anxiety, dementia, and autism spectrum disorder (Aalbers et al., 2017; Bradt et al., 2013, 2016; Geretsegger et al., 2014; van der Steen et al., 2018). This pattern

ISSN Online: 3007-3154
ISSN Print: 3007-3146
Vol. 3 No. 11 (November) (2025)

supports the interpretation that the field has become increasingly embedded in multidisciplinary clinical practice.

The apparent decline in average citations per year for newer publications and the sharp drop in recorded output after the most recent indexed years are best understood as bibliometric artefacts rather than substantive contractions. Citation-window effects mean that recent articles have had less time to accumulate citations, while changes in database processing and indexing schedules commonly suppress counts for the most current years (Donthu et al., 2021). Similar distortions have been documented when comparing Web of Science coverage across disciplines and time, particularly for emerging or interdisciplinary areas (Mongeon & Paul-Hus, 2016). In this context, the observed "decline" after roughly 2015 in citations and after 2023 in output likely reflects the interaction of citation lag, indexing delays, and evolving journal coverage rather than a collapse in research activity.

Viewed together, the production and citation patterns point to three broad phases in the development of music therapy scholarship: an emergence phase with low, exploratory output; a consolidation phase aligned with the growth of controlled trials, meta-analyses, and neurologic music therapy (Thaut & Abiru, 2010; Thaut et al., 2015); and a diversification phase in which research extends into new populations, settings, and delivery modalities. This staged evolution is consistent with how other applied health fields have moved from proof-of-concept interventions to more nuanced and specialized lines of inquiry (Donthu et al., 2021).

Authorship, Institutional Hubs, and Global Inequalities (RQ2)

The authorship and source patterns reveal a relatively cohesive core of highly productive scholars and journals. A small number of authors contribute disproportionately to the literature, often publishing across multiple leading journals and anchoring key thematic clusters. This concentration can be beneficial, providing continuity in theory, methodology, and training pipelines, and helping to sustain high standards of clinical and research practice. At the same time, it raises questions about agenda-setting power and the possibility that certain topics, populations, or approaches receive sustained attention while others remain marginal.

Institutionally and nationally, the field is clearly dominated by high-income, Anglophone countries and a limited set of research-intensive universities. The prominence of institutions in the United States, Australia, the United Kingdom, and parts of Northern Europe reflects broader structural hierarchies in global science, where funding availability, research infrastructure, and English-language publication requirements enhance visibility and influence. Bibliometric comparisons between Web of Science and other databases have shown that such patterns are partly reinforced by selective journal coverage and language filters (Mongeon & Paul-Hus, 2016). In music therapy, this means that work rooted in non-Western musical traditions, community-based practices, or local health priorities may be underrepresented in indexed literature, even if it is clinically or culturally significant.

International co-authorship patterns confirm a hub-and-spoke network structure. A small group of countries functions as collaboration hubs, linked through dense co-authorship ties and multi-institutional projects, while many regions, particularly in the Global South, show sparse or no participation in

ISSN Online: 3007-3154
ISSN Print: 3007-3146
Vol. 3 No. 11 (November) (2025)

indexed collaborations. This has implications for whose experiences and needs are reflected in the evidence base. When most data come from high-income contexts, there is a risk that intervention models, outcome measures, and implementation frameworks are implicitly tailored to those health systems and cultural settings. Addressing these imbalances will require deliberate strategies for South–South partnerships, equitable North–South collaborations, and capacity-building initiatives that support research training and infrastructure in underrepresented regions.

Thematic Structure and Emerging Frontiers (RQ3)

The thematic analyses converge on a set of core clinical engines that have driven music therapy research over the past decades. Anxiety, depression, pain, cancer, dementia, stroke, and child and adolescent mental health form the backbone of the field's conceptual and empirical activity. These foci are congruent with the systematic reviews demonstrating benefits of music therapy and music-based interventions across major mental health and medical conditions (Aalbers et al., 2017; Bradt et al., 2013, 2016; Loewy et al., 2013; van der Steen et al., 2018). Their centrality in the keyword networks and thematic maps suggests that music therapy has aligned itself with areas of high disease burden where psychosocial, cognitive, and neurophysiological mechanisms are particularly responsive to musical stimulation (Thaut et al., 2015).

Alongside these core themes, the field contains smaller, more specialized clusters that reflect promising but still under-developed lines of work. Research on preterm infants in neonatal intensive care, autism and communication, caregiver-child relationships, and specific rehabilitation contexts represents a shift toward developmental, relational, and family-centered perspectives (Geretsegger et al., 2014; Loewy et al., 2013). In the thematic map, these clusters appear as niche or emerging themes, characterized by relatively lower centrality and density. Their position suggests that, while methodologically and clinically rich, they remain less integrated into the broader network of music therapy topics, often due to smaller sample sizes, heterogeneity in intervention protocols, and the challenges of conducting large-scale trials in vulnerable populations.

The most rapidly evolving thematic frontier involves technology-mediated music therapy. The emergence of keywords related to telehealth and digital delivery reflects the rapid pivot to remote services during and after the COVID-19 pandemic, as music therapists adapted clinical work to videoconferencing and home-based formats (Clements-Cortés et al., 2025). These developments offer clear advantages in terms of accessibility, continuity of care, and the possibility of reaching clients who face geographical, mobility, or health-related barriers. At the same time, they raise concerns related to audio quality, latency, technology access, and the potential dilution of embodied, co-present musical interaction. The field is now at a point where feasibility and acceptability studies need to be followed by more rigorous evaluations of clinical effectiveness, cost, and equity, including the use of updated reporting guidelines for music-based interventions (Burns et al., 2010; Robb et al., 2025).

Methodological Reflections, Strengths, and Limitations

Methodologically, this study's main strength lies in its combination of a long historical horizon, detailed data cleaning, and the integration of performance, structural, and thematic indicators using established bibliometric tools (Aria &

ISSN Online: 3007-3154
ISSN Print: 3007-3146
Vol. 3 No. 11 (November) (2025)

Cuccurullo, 2017; Donthu et al., 2021). By applying a consistent search strategy and harmonizing key fields such as author names and keywords, the analysis offers a coherent representation of how music therapy research has evolved over time.

However, several limitations must be acknowledged. First, the exclusive reliance on the Web of Science Core Collection inevitably introduces coverage biases, particularly against non-English, regional, and practice-oriented journals (Mongeon & Paul-Hus, 2016). Second, the restriction to peer-reviewed articles omits relevant evidence from book chapters, conference proceedings, and grey literature, which may be especially important in emerging regions or practice communities. Third, the choice of search terms, while broad, may still have missed some interventions that use music in therapeutic ways but are not explicitly labeled as music therapy or music-based interventions. These constraints mean that the picture presented here is necessarily partial and should be interpreted as a map of indexed, journal-based scholarship rather than of all music therapy practice and knowledge.

Implications and Future Directions

The combined analysis of production trends, collaboration networks, and thematic evolution highlights several actionable implications for research, practice, and policy. For researchers, the dominance of a small set of clinical themes indicates where evidence is already strong and ripe for refinement, such as optimizing protocols for depression, cancer-related symptoms, dementia, and neurologic rehabilitation, while the niche and emerging clusters point to under-explored areas requiring larger, methodologically rigorous studies, including work with preterm infants, autistic individuals, caregivers, and culturally diverse communities. Strengthening research in underrepresented regions and institutions is critical if music therapy is to become genuinely global rather than concentrated in a handful of high-income contexts.

For practitioners, the mapping confirms that music therapy has a substantial evidence base in several core areas, supporting its integration into multidisciplinary teams in mental health, oncology, neurology, and gerontology (Aalbers et al., 2017; Bradt et al., 2016; Thaut & Abiru, 2010; van der Steen et al., 2018). At the same time, the rapid growth of telehealth and digital formats calls for reflective practice: clinicians need to balance the opportunities of remote delivery with careful attention to client access, therapeutic relationship, and fidelity to core principles of music therapy (Clements-Cortés et al., 2025). For policymakers and professional bodies, the findings underscore the value of targeted investment in multi-country research consortia, in training programs in regions currently absent from the bibliometric map, and in the widespread adoption of standardized reporting guidelines for music-based interventions. Such initiatives could help reduce global inequities, strengthen the field's methodological foundations, and ensure that music therapy's future development is both scientifically robust and socially inclusive.

In sum, this bibliometric analysis portrays music therapy as a steadily expanding, increasingly interdisciplinary field anchored by strong clinical cores, yet marked by geographic and thematic imbalances. By identifying consolidated strengths and emerging frontiers, the study offers a strategic framework to guide future scholarship, practice, and policy toward a more equitable and globally responsive music therapy landscape.

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