

Your Favorite Tunes Could Be the Key to Better Workouts and Feeling Great

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STORY AT-A-GLANCE

- › Personalized Interactive Music Systems (PIMSs) use sensors and wearables to sync songs to your movement in real time
- › A systematic review and meta-analysis in JMIR Human Factors pooled data from 18 trials and found that PIMSs significantly improved physical activity levels by making workouts more fun
- › With 1.8 billion inactive adults globally, PIMS offer a promising way to combat a sedentary lifestyle
- › Music therapy shows powerful benefits: From improving cognition and mood to reducing stress and enhancing emotional well-being
- › Music can also ease pain naturally, offering a simple, non-pharmaceutical way to support healing, relaxation, and add joy to your life

Since the beginning of time, people have turned to sound to inspire action. Ancient warriors marched into battle to the beat of drums, using rhythm to help them maintain a steady pace.¹ Centuries later, sailors sang sea shanties to keep their movements in sync during grueling work at sea.² Throughout different cultures and times, music has shown that it can do more than entertain.

That connection hasn't faded. Today, music drives movement – from spin class bass to runner playlists. Now, technology elevates this with Personalized Interactive Music Systems (PIMs), smart platforms that adapt rhythm and tempo to your body in real time. Whether walking, cycling, or lifting, these systems make music work with your body rather than just for your ears.³ There's new research brewing that explores this, and the breadth and potential of the results are fascinating.

Adaptive Music's Impact on Exercise Performance and Enjoyment

A systematic review and meta-analysis published in JMIR Human Factors examined whether PIMS can make workouts more engaging and emotionally rewarding. A team of researchers from the University of Jyväskylä analyzed evidence from multiple countries to understand how real-time music adaptation influences physical activity, perceived effort, and mood.⁴

- **The review pooled data from 18 studies** – Unlike clinical trials with fixed timelines, this review aggregated results from independent studies, each with its own duration and design. Some were short-term, focusing on a single exercise session, while others lasted several weeks. Six studies with 17 intervention arms provided sufficient data for meta-analysis, allowing researchers to identify overall trends rather than measure outcomes in a single experiment.⁵
- **Researchers applied advanced statistical methods to ensure accuracy** – They used random-effects models, which account for differences between studies, and meta-regression to test whether factors like music tempo influenced results. Outcomes were grouped into three domains:⁶
 - **Physical** – Activity level and objective exertion measures
 - **Psychophysical** – Ratings of perceived exertion (RPE)
 - **Affective** – Mood and enjoyment during exercise

- **Mood and enjoyment saw the largest boost** – Affective valence, which measures positive feelings, showed a significant effect ($g \approx 1.65$).⁷ In simple terms, workouts felt much more pleasant and motivating when music was adapted in real time. Dr. Andrew Danso, the study's lead author, remarked:

"Music has always been a motivator for movement. By personalizing it in real time, we might better support people in sustaining exercise routines."⁸

- **Tempo matters and faster beats amplify benefits** – Music with faster tempos are linked to greater exercise benefits. Matching tempo to your movement speed can boost performance by helping your body sync with the rhythm. This alignment promotes better coordination, efficiency, and endurance, making your workout feel smoother and more sustainable.⁹
- **Evidence is promising but in its early stages** – The review included studies from Europe, Asia, and North America, but noted variability in design and quality. Researchers call for larger, high-quality trials to confirm these effects and refine adaptive music technology.

Can Music Help the World Be Less Sedentary?

The featured paper showcases PIMS's potential as a tool to promote activity and address global health issues caused by inactivity.¹⁰ Physical activity is essential for preventing chronic disease and supporting mental health, yet people are moving less than ever. In 2022, the World Health Organization (WHO) reported that 31% of adults – about 1.8 billion people – did not meet recommended activity levels.¹¹

Global inactivity has risen by 5 percentage points since 2010, and if this trend continues, it could reach 35% by 2030, putting millions at risk for preventable illness. But why is it so hard to get moving?

- **Most people miss even basic movement goals** – The WHO recommends 150 minutes of moderate activity or 75 minutes of vigorous activity per week, but many people do not meet this recommendation. This is problematic, as inactivity raises the risk of cardiovascular disease, Type 2 diabetes, breast and colon cancer, cognitive decline, and more.¹²
- **Some regions face especially high risk** – Inactivity rates are highest in high-income Asia Pacific (48%) and South Asia (45%), compared to 28% in high-income Western countries and 14% in Oceania.¹³
- **Women and older adults move less** – Globally, 34% of women are inactive compared to 29% of men, and adults over 60 are the least active – a troubling trend given the importance of movement for healthy aging.¹⁴
- **Common barriers keep people from staying active** – Even though "physical activity" includes all forms of movement and "exercise" refers to structured training, many struggle with motivation, time pressure, stress, and lack of enjoyment.¹⁵

So, where does music fit in? Rhythm was humanity's first movement cue long before fitness trackers and apps. Today, systems like PIMS sync your favorite songs with your workouts, making it an enjoyable and entertaining experience instead of a chore. Music doesn't just make movement easier – it activates the brain in ways that keep you coming back.

Your Brain Lights Up When It Hears Your Beloved Tunes

Did you know that speaking activates about 10 regions of the brain, but music lights up 20 to 30,¹⁶ including areas linked to memory, movement, and coordination? This deep engagement explains why music feels so powerful during exercise. Let's explore what happens to the brain when you hear a song you like:

- **The reward system fires up** – Music stimulates the nucleus accumbens, which releases dopamine, the chemical linked to pleasure and motivation. This is why hearing your favorite song feels so good.¹⁷
- **The emotional center responds** – The amygdala is the part of your brain that processes emotions, and it is triggered by music. This explains why certain melodies can make you cry, smile, or feel nostalgic.¹⁸
- **The "thinking brain" gets involved** – The prefrontal cortex engages in pattern recognition and prediction, helping your brain anticipate what comes next in a song.¹⁹
- **It gets excited when faced with the unfamiliar** – In one study published in PLOS One, researchers used functional magnetic resonance imaging (fMRI), to scan participants' brains while they listened to music. They discovered that the more active these regions were – especially the nucleus accumbens – the more money participants were willing to pay for songs they had never heard before.²⁰

In simple terms, the stronger the emotional and intellectual response, the more valuable the music felt to the listener. Neuroscientist Valorie Salimpoor, Ph.D., the study's lead author, explained that your brain learns to anticipate how music will unfold using pattern recognition and prediction – skills that may have been crucial to human evolution. As reported by Time:²¹

"These predictions are culture-dependent and based on experience: someone raised on rock or Western classical music won't be able to predict the course of an Indian raga, for example, and vice versa. But if a piece develops in a way that's both slightly novel and still in line with our brain's prediction, we tend to like it a lot. And that, says Salimpoor, 'is because we've made a kind of intellectual conquest.'

Music may, in other words, tap into a brain mechanism that was key to our evolutionary progress. The ability to recognize patterns and generalize from experience, to predict what's likely to happen in the future – in short,

the ability to imagine – is something humans do far better than any other animals. It's what allowed us (aided by the far less glamorous opposable thumb) to take over the world."

And here's where it gets interesting: the same qualities that make music so emotionally and mentally stimulating are the foundation of music therapy. From reducing stress to improving cognitive function, structured musical engagement is now being used as a powerful tool for health and healing.

If you want to know music helps in adding to the quality of life for the elderly, read "[How Music Helps Unlock Memories and Improve Quality of Life for Dementia Patients.](#)"

Music Therapy Gives Joy, Hope, and Healing

As its name suggests, music therapy refers to a type of creative therapy that uses music to support a person's emotional and physical well-being. Unlike talk-based approaches, it helps people who find verbal expression challenging. In practice, it's structured and goal-oriented, involving activities like listening, singing, improvising, and moving to music.

Because it's so adaptable, music therapy is now being used in hospitals, dementia care, neurological clinics, and community programs. Below are three real-world examples of how music therapy makes a difference:

- **Dementia** – A large Monash University study examined how listening to music and playing instruments relate to cognitive health in adults over 70. Published in the *International Journal of Geriatric Psychiatry*, the research, which involved more than 10,800 older adults, found that regularly listening to music was associated with up to a 39% reduced risk of developing dementia.²²

The study was part of the ASPirin in Reducing Events in the Elderly (ASPREE) project and followed cognitively healthy adults over 70 for several years, tracking both their musical habits and cognitive outcomes.²³

Participants who frequently or consistently listened to music had stronger cognitive scores overall, including better episodic memory – a key function that typically declines early in dementia. Playing a musical instrument also carried benefits, showing a 35% reduced risk, and combining listening with playing was linked to a 33% reduction.²⁴

Professor Joanne Ryan, senior study author, emphasized the importance of identifying strategies to help prevent or delay onset of the disease since there is no known cure.²⁵

"Evidence suggests that brain ageing is not just based on age and genetics but can be influenced by one's own environmental and lifestyle choices. Our study suggests that lifestyle-based interventions, such as listening and/or playing music can promote cognitive health."

- **Temporal lobe epilepsy** – Researchers at The Ohio State University Wexner Medical Center discovered that the brains of people with epilepsy respond to music differently than those without disorder.²⁶ When participants listened to music, their brainwave activity increased significantly:²⁷

"We found significantly higher levels of synchronization and spectral EEG activation when listening to music in the frontal cortex and temporal cortex, especially in persons with epilepsy. We speculate that music may be useful to enhance electrical activity specific to the frontal and temporal cortices."

Christine Charyton, Ph.D., who presented the findings at the American Psychological Association's 123rd Annual Convention, explained: "We were surprised by the results. We hypothesized that music would be processed

differently than silence, but we didn't know whether that difference would be the same or greater in people with epilepsy."²⁸

- **Alzheimer's disease** – A 2023 study published in *Frontiers in Psychology* found that combining nostalgic, activity-based music therapy with standard care produced meaningful improvements in patients with mild to moderate Alzheimer's disease.²⁹

Researchers enrolled 63 patients and randomly assigned them to either routine treatment or routine treatment plus nostalgic music therapy for 12 weeks. By the end of the study, 30 participants in each group had completed the intervention. Those receiving music therapy scored higher on cognitive tests and showed greater improvements in anxiety and depression compared with the control group. According to the researchers:³⁰

"Our findings suggest that integrating nostalgic music with routine daily care as an appropriate non-pharmacological intervention can improve cognitive function, alleviate negative emotions, and enhance sleep quality in Alzheimer's disease (AD) patients, while also reducing the societal burden of the disease.

This approach not only offers potential benefits for patient wellbeing but also provides broader implications for Alzheimer's care by highlighting the value of culturally resonant, individualized therapeutic strategies within healthcare practices."

Music Has Impressive Benefits

Music is a universal emotional language – It doesn't need grammar or vocabulary to communicate, yet it connects directly to your feelings. Besides improving exercise and helping people with neurological conditions, music also:³¹

- Improves learning, memory, and cognition
- Reduces stress

- Relieves anxiety and depression
- Regulates your nervous system
- Boosts creativity
- Regulates your mood
- Boosts your immune system
- Improves sleep quality
- Protects your brain health
- Maintains heart health

Music Helps People Deal with Pain Without Pills

According to a study published in *The Lancet*, more than 51 million procedures are performed each year in the U.S., with millions more worldwide. Recovery can be challenging, even with standard strategies like pain medication and nutrition support. Yet not all helpful options have been fully explored – and one promising approach is music.³²

- **Music as a potential solution** – To evaluate its role, researchers conducted a systematic review and meta-analysis analyzing 73 randomized controlled trials involving adult surgical patients.³³
- **Reduced pain and lower reliance on medication** – Patients exposed to music before, during, or after surgery reported significantly less pain and required fewer opioid painkillers. This not only eased discomfort but also reduced the risks associated with opioid use, such as side effects and dependency.³⁴
- **Effective even under general anesthesia** – Music's impact wasn't limited to conscious patients. When played during surgery under anesthesia, it still lowered pain and anxiety markers, suggesting music interacts with the nervous system beyond conscious awareness.³⁵

- **The numbers speak volumes** – Anxiety scores dropped across the board, particularly in patients with high preoperative stress. Music also improved overall satisfaction with care, thereby enhancing cooperation and adherence to recovery plans. According to the researchers:³⁶

"We identified 4261 titles and abstracts, and included 73 RCTs in the systematic review, with size varying between 20 and 458 participants. Choice of music, timing, and duration varied.

Comparators included routine care, headphones with no music, white noise, and undisturbed bed rest. Music reduced postoperative pain (SMD -0.77 [95% CI -0.99 to -0.56]), anxiety (-0.68 [-0.95 to -0.41]), and analgesia use (-0.37 [-0.54 to -0.20]), and increased patient satisfaction (1.09 [0.51 to 1.68]), but length of stay did not differ (SMD -0.11 [-0.35 to 0.12])."

- **Safe, adaptable, and easy to implement** – Researchers concluded that music is a non-invasive, low-cost intervention that can be seamlessly integrated into clinical settings without disrupting standard care. They also emphasized that selecting the right music at the right time is essential.³⁷

"Subgroup analyses showed that choice of music and timing of delivery made little difference to outcomes. Meta-regression identified no causes of heterogeneity in eight variables assessed. Music was effective even when patients were under general anaesthetic."

5 Ways to Add More Music to Your Life

Recovering from stress, pain, or emotional burnout takes more than one approach. While medication and nutrition help, research shows that simple, non-invasive strategies like music therapy can also make a big difference.

If you want to know my thoughts about music's profound ability to help you heal, read "[Harnessing the Healing Power of Music](#)." Below are some simple ways to incorporate your favorite tunes into your day-to-day life.

- 1. Revisit songs you loved as a kid** — Listen to the tunes you would happily **dance to** in your room, or you would gladly sing aloud. These tracks are deeply wired into your memory and can help restore feelings of safety and joy when you're feeling anxious.
- 2. Build personalized playlists** — Create a playlist to calm you, one to energize you, and one to help you release emotions. Use them intentionally — calming tracks for anxious moments, upbeat songs when you feel stuck, and emotional ones when you need to let go.
- 3. Focus on the goodness of a song** — Instead of background noise, choose a single track and listen deeply. Close your eyes, breathe, and let the sound take over. This focused listening activates brain circuits that reduce stress and restore balance.
- 4. Feeling restless? Reset your rhythm** — If your sleep or energy feels off, listen to steady, rhythmic music at the same time each day — like right after waking or before bed. Rhythm helps your brain re-establish patterns and regulate your internal clock.
- 5. Seek meaningful connections** — Join a choir, attend a drum circle, or simply sing with friends or family. Shared music triggers bonding hormones like oxytocin, which can ease feelings of isolation and boost emotional resilience.

Music doesn't just enhance your workouts — it infuses joy into every movement. Beyond its role in recovery and brain health, it's woven into every part of life, and your body responds to it instinctively. Life gets tough, but if you can dance to the beat of your own drum or sing your own song, you know things will get better.

Frequently Asked Questions (FAQs) About Music Therapy

Q: What are Personalized Interactive Music Systems (PIMs)?

A: PIMs are smart music platforms that connect to wearables and smartphones, read your movement in real time, and adjust musical features like tempo, beat, and style to match your pace. Instead of a fixed playlist, the music responds to how fast you walk, cycle, or lift, creating a dynamic soundscape that stays in sync with your body.

Q: What did the recent study on PIMs reveal?

A: The review, which pooled data from 18 studies, showed PIMs significantly increased physical activity, greatly boosted positive feelings, and worked best with faster tempos. People enjoyed workouts more and performed better without higher perceived exertion.

Q: Who is most at risk of being sedentary?

A: WHO data show 1.8 billion adults are inactive. Women (34% inactive), adults over 60, and people in high-income Asia Pacific (48%) and South Asia (45%) have the highest inactivity rates, raising their disease risk.

Q: What happens in the brain when it hears favorite music?

A: Music activates 20 to 30 brain regions, triggering dopamine in the nucleus accumbens, emotional responses in the amygdala, and prediction processing in the prefrontal cortex, making music highly pleasurable, motivating, and deeply engaging.

Q: Is it possible to manage pain with music only?

A: Music can significantly help reduce pain, especially when combined with healthy habits. Stay active, listen to uplifting songs, customize playlists to suit your needs, and spend time with others creating or listening to music.

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