

Medicinal Melodies: A Scoping Review of Music In Medical Education

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ABSTRACT

As medical education advances, integrating empathy and emotional intelligence with technical skills remains essential. The field of medical humanities, encompassing disciplines such as the study of music, is increasingly recognized as crucial for cultivating these interpersonal and emotional competencies. Music has been recognized for its significant role in enhancing interpersonal skills, stress management, and empathy among medical students. This review examines various approaches to integrating music into medical education, including active participation in performances, reflective listening practices, structured coursework, and professional development workshops. Participation in musical groups has shown benefits in stress relief, teamwork, and cultural appreciation. Reflective listening to music, such as attending performances and analyzing them, helps enhance self-awareness and non-verbal communication skills. Formal coursework and clinical applications of music therapy provide students with insights into how music can improve patient care, fostering greater patient engagement and building stronger rapport. While professional development seminars are beneficial, they often face challenges in securing student engagement and may lack opportunities for direct patient interaction. Despite the promising evidence, challenges exist. Methods relying on musical skills might exclude non-musicians, and the effectiveness of listening-based approaches can vary with personal music preferences. Theoretical frameworks in music-based pedagogy advocate for integrating these methodologies with empirically supported clinical practices to develop a comprehensive and structured curriculum. Overall, integrating music into medical education offers the potential to enhance humanistic practices and improve patient interactions, though further research is needed to optimize and formalize these approaches.

RÉSUMÉ

À mesure que la formation médicale progresse, l'intégration de l'empathie et de l'intelligence émotionnelle aux compétences techniques demeure essentielle. Le domaine des sciences humaines médicales, qui englobe des disciplines telles que l'étude de la musique, est de plus en plus reconnu comme crucial pour cultiver ces compétences interpersonnelles et émotionnelles. La musique a été reconnue pour son rôle significatif dans l'amélioration des compétences interpersonnelles, de la gestion du stress et de l'empathie chez les étudiants en médecine. Cette étude examine diverses approches pour intégrer la musique dans la formation médicale, y compris la participation active à des représentations, des pratiques d'écoute réflexive, des cours structurés et des ateliers de développement professionnel. La participation à des groupes musicaux s'est révélée bénéfique pour le soulagement du stress, le travail d'équipe et l'appréciation de la culture. Une écoute réfléchie de la musique, par exemple en assistant à des représentations et en les analysant, contribue à améliorer la conscience de soi et les compétences en matière de communication non verbale. Les cours structurés et les applications cliniques de la musicothérapie permettent aux étudiants de mieux comprendre comment la musique peut améliorer les soins prodigués aux patients, ce qui favorise l'engagement des patients et l'établissement de rapports plus étroits. Bien que les séminaires de développement professionnel soient bénéfiques, ils se heurtent souvent à la difficulté de susciter l'engagement des étudiants et peuvent manquer d'occasions d'interaction directe avec les patients. Malgré les preuves prometteuses, il existe des défis à relever. Les méthodes reposant sur les compétences musicales peuvent exclure les non-musiciens, et l'efficacité des approches basées sur l'écoute peut varier en fonction des préférences musicales personnelles. Les cadres théoriques de la pédagogie basée sur la musique préconisent l'intégration de ces méthodologies aux pratiques cliniques soutenues empiriquement afin de développer un programme d'études complet et structuré. Dans l'ensemble, l'intégration de la musique dans la formation médicale offre la possibilité de renforcer les pratiques humanistes et d'améliorer les interactions avec les patients, bien que des recherches supplémentaires soient nécessaires pour optimiser et formaliser ces approches.

INTRODUCTION

As medical science continues to advance with innovative therapies, the need for medical education to develop physicians who are both technically skilled and emotionally intelligent remains crucial. Both physicians and patients agree that empathy is one of the core tenets of patient care and that it can positively influence clinical outcomes.¹ However, the pedagogical foundation for teaching empathy remains unclear, particularly considering the demanding nature of technical education, the implicit curriculum that may foster desensitization and detachment, and evidence indicating a decline in empathy as students progress through medical school.² Disillusionment with the healthcare system has reached concerning levels among a significant number of patients, due in part to a lack of empathy in physicians.³

In response, there has been a renewed focus on integrating medical humanities into the education of healthcare professionals. This approach highlights the practice of humanistic medicine, which prioritizes placing the patient at the center of care. It emphasizes the importance of maintaining respect, dignity, and a genuine interest in the patient's well-being as fundamental values. Additionally, it advocates for a holistic approach that considers the patient's emotional, social, and psychological needs alongside their physical health.³ Medical humanities aim to restore trust and strengthen the patient-provider relationship by fostering empathy, communication, and ethical reasoning. Subjects include history, philosophy, literature, and music, whose study can provide a more holistic view of illness and patient experience.

The study of music is unique in that the connection between excellence as a musician and physician has long been known, with many physicians and medical students engaging in musical activities.⁴ Some educators assert that music can impart the principles of humanistic practice to medical students. Evidence suggests that medical students with musical backgrounds exhibit enhanced active listening skills, communicative abilities, and stress management techniques.⁴ These skills collectively contribute to more effective and empathetic interactions with patients, although more work is needed to robustly confirm these associations.⁴ Consequently, several medical schools have incorporated aspects of music, including music therapy, into their curricula. These additions serve a dual purpose: they equip students with a therapeutic tool that can enhance patient care and offer a distinctive opportunity for

students to gain a more profound understanding of patient experiences. By engaging with music in this way, students are encouraged to consider the cultural and historical contexts that shape patient care, ultimately enriching their educational journey and broadening their perspective on the diverse needs of the individuals they will treat.⁵ Despite its potential, there is a notable gap in research regarding the formal integration of music into medical education and its deliberate use to enhance reflective practices, interpersonal skills, and empathy among medical students. Therefore, this scoping review aims to explore the extent to which music has been implemented in medical education and to contrast the various methods by which it is used among various medical schools.

METHODS

Relevant Research Studies

All articles were obtained from the electronic databases PubMed, EMBASE, and OVID Medline. The search involved MeSH, keywords, and title and abstract searches. The following terms were used to obtain the articles used: music [MeSH and Keyword], music therapy [MeSH and Keyword] AND medical student [MeSH and Keyword], medical school [MeSH and Keyword], medical education [MeSH and Keyword], medical faculty [MeSH and Keyword], undergraduate medical education [MeSH and Keyword], medical graduate [MeSH], med student [Keyword], med school [Keyword], med program [Keyword], medical trainee [Keyword], undergrad medical education [Keyword].

Selection of Articles

The inclusion criteria consisted of articles that: 1) were in English; 2) involved medical students and medical education; 3) were about how music is or can be used in medical education; 4) were about contemporary medical practices. Articles were excluded if they: 1) were about graduate students, higher educational levels, or non-medical students; 2) involved music in other contexts (music in the operating room, etc.); 3) were about humanity topics other than music; 4) were not published full articles (abstracts, posters, etc.); 5) were retracted papers. This process is summarized in Figure 1.

RESULTS

Article Review Process

Following selection, 1478 potential papers that fit the preliminary search criteria were collected (PubMed: 381, OVID Medline: 308, EMBASE: 789). Duplicates were removed, leaving 868 papers remaining. A title review was conducted, and relevant articles were chosen, reducing the number of articles to 127. An abstract review further reduced the number of articles, leaving 48 for full manuscript review. The manuscript review aimed to determine how relevant these articles were in answering the research question, and to determine whether they fit into predetermined inclusion criteria. Papers connecting contemporary medicine and the benefits of music in medical education were included. Any articles that discussed how other humanities benefited medical education were excluded. Articles that focused only on how music benefited students academically were also excluded. The final number of articles included

was 14. Results are displayed in Table 1.

Of the 14 selected articles, 5 were commentaries, 3 had qualitative study designs, 3 had quantitative study designs, and 3 were case reports. All 14 articles claimed that music can significantly improve humanistic characteristics in medical students, and can support the technical curriculum well. Medical schools have employed four distinct modalities to integrate music into their curricula: participation in performance, reflective listening, formal coursework, and professional development workshops. Additionally, educators have suggested theoretical frameworks and objectives for incorporating music into medical education.

Through participation in performance, students of varying skill levels and ethnic backgrounds formed bands and orchestras, performing for the community. Commonly noted benefits included stress management, mentorship, teamwork, and diversity; as such, this method has gained positive appraisal from students and faculty alike.⁵⁻⁷ Other medical schools have utilized listening to music as an educational tool by requiring students to attend performances and reflect on their experiences, or by incorporating background music in academic settings. For instance, one study involved a group of students with no formal music training who attended 15 opera performances.⁸ Students noted that attending the performances as a group and discussing afterward promoted reflective attitudes, and self-examination, fostering disclosure of emotions.⁸ Students observed that the characters in the opera performance embodied a range of emotional archetypes, offering a distinctive perspective on human emotions by illustrating both negative and positive values, attitudes, and behaviors. Researchers also noted that these attitudes demonstrated a lasting impact, described as a 'delayed effect', persisting beyond the immediate exposure to the performances.⁸ In another study, 72 medical students were asked to attend string quartet performances, to promote awareness of non-verbal communication skills within team dynamics.⁹ Researchers employed pre- and post-performance surveys to evaluate shifts in attitudes. The results demonstrated a statistically significant improvement in students' ability to interpret non-verbal communication within healthcare teams, as well as in interactions between patients and providers, following the performance.⁹ One other commentary indicated that classroom attendance improved after playing music in the background and that students reported lower levels of stress.¹⁰

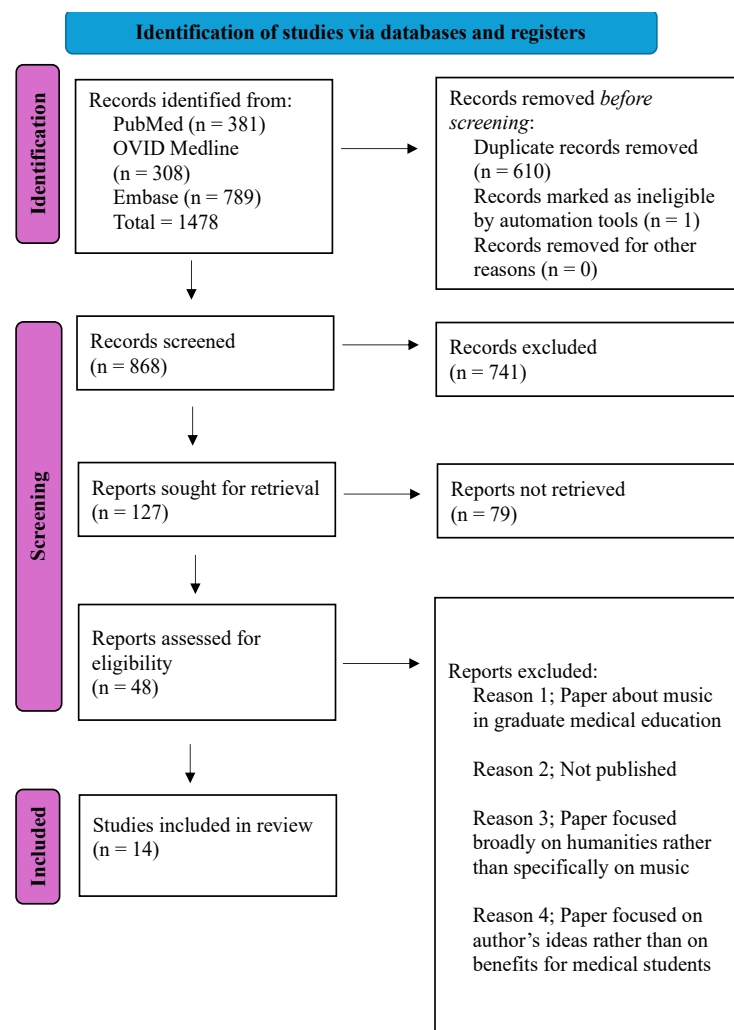


Figure 1. PRISMA flowchart for article selection

Table 1. Summary of various strategies medical schools have used to implement music into medical education (14 articles)

Author	Modality	Advantages	Disadvantages
Ortega et al. ⁵	Performing in a musical ensemble	Improves problem-solving ability	Difficult to measure changes in cultural competency
		Enhances communication with diverse groups	
		Promotes cultural competency by performing genres from different cultures	
Brooks ⁶	Participation in an orchestra performing classical music	Enhances teamwork and interpersonal relationships	N/A
		Improving emotional regulation	
		Improves collaboration	
Moshman ⁷	Participation in an orchestra performing classical music	Promotes service mindset	N/A
		Promotes a sense of teamwork	
		Improves communication skills	
Blasco et al. ⁸	Listening to opera performances	Promotes disclosure of emotions	N/A
		Promotes reflective attitudes that persist long after the performance	
		Can model positive and negative emotional behaviors	
Hall et al. ⁹	Listening to chamber music performances	May improve recognition of non-verbal cues	Difficult to remove Hawthorne bias in testing No clinical measure of improved non-verbal communication
		Does not require students to have a musical background	
		Promotes leadership among students	
Cook ¹⁰	Background music in academic setting	Improves class attendance	N/A
		Reduces subjective stress levels in students	
		Can improve engagement with patients	
Kobus et al. ¹¹	Music therapy: theory and clinical application	Evidence-based practices for students to use	Coursework is biased toward students with a background in music
		Fosters interdisciplinary dialogue when approaching patient care	
		Students explore insights into patient experiences	
Thompson et al. ¹²	Compulsory creativity classes, which can involve musical expression	Pushes students to think "outside the box"	Compulsory engagement may cause some students to lose interest
		Promotes disclosure of emotions	
		Can improve empathy for patient experiences	
Frich and Fugelli ¹³	Professional development workshop	May provide alternative insights into patient experiences	Students show varying levels of interest; some struggle to see relevance
		Provides a connection between music and physiology	
		May provide alternative insights into patient experiences	
Harz et al. ¹⁴	Professional development workshop	Creates awareness of hidden curriculum promoting desensitization	Event lasts one day, and reflective attitudes may not persist
		Promotes reflective attitudes	
		Improves subjective self-awareness of emotion	
Ledger and Joynes ¹⁵	Professional development workshop	Promotes reflective attitudes	Biased towards students who have a musical background Workshop is interest-based, so many non-musicians hesitate to participate
		Improves awareness of the therapeutic benefit of music in patient care	
		Improves self-awareness	
Rivas et al. ¹⁶	Professional development workshop	Improves management of own emotions	Measures of emotional intelligence may not be rigorous enough to be applied to the patient-provider relationship
		Promotes empathy and emotional intelligence	
		Offers 10 professional skills	
Davidoff ¹⁷	Theoretical Frameworks and Pedagogical Goals	medical students can learn from musicians	N/A
		Can help develop resilience and self-awareness in students, with feedback from educators	
		Can teach students to become more present with patients	
Dorman and Kelly ¹⁸	Theoretical Frameworks and Pedagogical Goals	Promotes active listening skills and engagement	N/A
		Can help students develop better rapport with patients	

To maximize the accessibility of music's benefits for a broad range of students, other medical schools took a more formal approach, directly teaching the benefits of music, rather than putting the onus on students. In one medical school, students participated in a course regarding the benefits of music therapy in pediatric care, with a focus on how it can complement contemporary medical treatments.¹¹ The course was structured into two stages: a pre-clinical phase, during which students were introduced to the fundamentals of music therapy and its impact on patient well-being, including vital signs and emotional health; and a subsequent clinical phase, where students applied these principles in patient interactions. Notably, 100% of the students recognized that music significantly enhances patient well-being in the stressful environment of a hospital.¹¹ Children became more alert, calm, and communicative following music therapy, and 94% of students were fascinated by how quickly they could form a connection with unfamiliar patients.¹¹ 57% of students reported being able to fully concentrate on the patient, blocking out other distractions.¹¹ 94% of students in this study wished to recommend complementary therapies such as music to patients and families in their future practice.¹¹ Another medical school has incorporated mandatory creativity classes, allowing students to engage in artistic expression, such as music, to explore themes related to patient care and emotional well-being.¹²

Professional development training represents another method for formally integrating music education into medical school curricula. Like course-based approaches, these seminars aim to increase awareness of how music can support emotional development and enhance patient care. At one medical school, these seminars concentrated on research linking music with medicine across various fields, including physiology, endocrinology, and neurology, with a focus on evidence-based practices and the latest research advancements.¹³ Other seminars took similar approaches, aiming to educate students on how music can improve emotional intelligence, promote reflective attitudes, and provide alternative insights into patient experiences.¹⁴⁻¹⁶ Furthermore, one workshop also worked to build awareness about the hidden curriculum promoting desensitization.¹⁴

Lastly, rather than listing the benefits they noticed in students, some authors provided theoretical frameworks for music-based pedagogy, giving opinions on what these

courses must focus on developing in students.^{17,18} Results are displayed in Table 1.

DISCUSSION

Dr. William Osler once said, "The good physician treats the disease; the great physician treats the patient who has the disease." The significance of humanistic practice in medicine is widely acknowledged by both physicians and medical schools. In response, medical schools have adopted music-based approaches to cultivate humanistic values among medical students, with the expectation that these values will be integrated into their professional practice. Through the search performed, this article aims to characterize the methods various medical schools have taken in implementing music-based education to teach medical students the principles of humanistic practice and to explore the strengths and limitations of each approach.

Participation in Performance

Initially, musical groups were developed to promote interpersonal relations among students, but numerous benefits were revealed as they grew in popularity. Firstly, students had the opportunity to attend rehearsals after work and classes, allowing them to concentrate on the art of music-making and channel their stress into creative expression.⁶ Additionally, variations in musical skill levels within these groups had a beneficial impact on the students. More experienced students offered musical mentorship to their peers, fostering an environment of reciprocal feedback and collaborative learning. They facilitated discussions on diverse approaches to interpreting different musical passages, thereby enhancing the overall learning experience for all participants.⁵ Finally, the bands attracted students of various ethnic backgrounds and performed numerous styles of music, exposing students to the musical traditions of other cultures.⁵ Additional literature supports these findings, demonstrating that engagement in musical activities significantly enhances students' interpersonal relationships, communication skills, emotional regulation, and cultural appreciation. These studies highlight the broad positive impact of musical involvement on various aspects of personal and social development.^{19,20} Therefore, involvement in medical school bands, orchestras, or other musical activities offers students a proven method for cultivating emotional resilience through stress relief, enhancing essential communication skills, and developing cultural competency—factors that have been demonstrated to

positively influence patient care.⁴ The primary limitation of this approach is that it requires certain musical skills as a prerequisite, which may exclude medical students without a musical background from experiencing its benefits. Additionally, measuring changes in cultural competency over time presents a challenge, complicating the assessment of long-term impacts.

Listening and Consequent Reflection

A growing body of evidence suggests that the study of music is effective at developing emotional regulation, reflective attitudes, self-awareness, and communication skills. A study involving 265 university students found that those actively engaged in music demonstrated greater awareness of both positive and negative emotions. Additionally, these students showed an enhanced ability to articulate their emotions more effectively.²¹ The idea that music can be used to teach communication skills to medical professionals is also well-known, and there is a consensus that jazz is an excellent genre to model good communication skills, teaching students the art of active listening and conversational skills.²²⁻²⁵ This suggests that different genres of music may have varying effects on the development of these attitudes among students. Additionally, other studies have reported substantial improvements in medical students' mental health, noting reductions in anxiety and stress, as well as enhanced cognitive function, when music is utilized in this manner.²⁶⁻²⁸ Therefore, engaging in music listening and reflection has been shown to enhance and sustain emotional self-awareness, improve appreciation of non-verbal communication, and reduce stress among students. However, this approach is not without its limitations, as the effectiveness may be diminished if students do not appreciate or connect with the specific style of music used. This presents a challenge in assessing changes in reflective attitudes and communication skills, as students who favor the style of music employed are more likely to experience its benefits. Additionally, the application of music genres such as opera, which is often performed in Italian, may be problematic if students lose interest due to language barriers.

University Coursework and Clinical Application

Engaging with patients is a recognized method to improve adherence to treatment protocols and quality of care.²⁹ In a relevant study examining patient satisfaction with health-care providers, researchers discovered that a provider's ability to fully engage with patients significantly enhances

the satisfaction levels with the medical care received.³⁰ Therefore, the key to effectively integrating music into coursework appears to be emphasizing its clinical benefits for patients. By providing students with opportunities to observe firsthand how music can enhance patients' emotional states and facilitate rapport-building with unfamiliar patients, the advantages of incorporating music become more apparent and meaningful to them.¹¹ Furthermore, students who had musical backgrounds, and those who did not were involved in this study, controlling for bias that favors students who already enjoy music.¹¹ As such, the strengths of this approach are clear since there is less focus on the artistic side of music and more focus on the evidence-based usage of music to benefit patient care, appealing to the scientific basis students may seek as aspiring physicians. Importantly, this can also better control the bias that favors students who are already interested in music.

Professional Development Seminars

While seminars have some positive effects, such as building awareness of the hidden curriculum promoting desensitization, and aiming to improve emotional intelligence, empathy, and reflective attitudes,¹⁴ they are not without flaws. One issue is that many students question the relevance of music in medicine, representing a sizable group in one study.¹³ This may be attributed to the absence of direct patient interactions in the seminars, whereas the coursework included concrete examples illustrating the influence of music on patient well-being. As previously mentioned, showcasing the direct impact of music on patient interactions and outcomes provides a robust and compelling means of validating its effectiveness to students. This practical demonstration helps bridge the gap between theoretical knowledge and real-world application, thereby enhancing the perceived relevance and efficacy of music in clinical settings.¹¹ Another problem is that students may lose interest if attendance is made compulsory, and bias within these seminars favors students who are already involved in music. Furthermore, none of the seminars included in this study employed quantitative measures to assess changes in emotional intelligence. Additionally, the concept of emotional intelligence itself has faced significant criticism, with some studies arguing that it lacks sufficient rigor to be regarded as a formal theoretical framework.³¹ Therefore, while seminars do have important positive characteristics that should not be overlooked, they may not be the best approach for the development of humanistic skills. This is not to say that professional development workshops

are ineffective, but that a combination approach, involving both building awareness around desensitization, as well as evidence-based usage of music in patient care may be more beneficial for medical students.

Theoretical Basis for Effective Pedagogy

Overall, research suggests that music has a well-earned place in medical education. The benefits of developing humanistic characteristics in medical students will have important implications for the future of medical practice and will serve to improve interactions with patients, treatment protocols, and patient satisfaction. The challenge for educators lies in creating a rigorous and formal curriculum that engages a broad range of students. A notable commentary has addressed this challenge by outlining ten professional skills that music can impart to physicians. These skills include practice, mentorship-seeking, and teamwork, providing a foundation for integrating music into medical education.¹⁷ Another study provides the basis for music being used to teach students the art of being present with patients, an essential skill in humanistic practice.¹⁸ When these theoretical aspects are combined with evidence-based applications of music in clinical settings, as shown above,¹¹ the foundation for a formalized and effective music-based course in medical education begins to emerge.

Limitations

This study is not without its limitations. Due to the search terms used, certain relevant papers may have been excluded. Furthermore, some included articles were commentaries, providing expert opinions rather than quantitative evidence. Nevertheless, given the substantial number of articles reviewed and the quality of the data presented in the included studies, the conclusions drawn are substantiated by a significant body of literature. Furthermore, expert opinions match the conclusions made in quantitative studies, lessening ambiguity about the rigor of these opinions.

CONCLUSION

Medical schools have developed various methods of introducing music into medical school curricula to improve humanistic characteristics in their students. Methods such as allowing students to form bands, listening to music and reflecting on it, and implanting music into coursework and professional development all have unique approaches to educating students. However, certain methods, such as incorporating music into coursework and clinical teaching,

have shown a more profound impact on students, significantly altering their attitudes and perspectives on patient care. Consequently, future research should focus on a combined approach that integrates theoretical frameworks for pedagogy with evidence-based practices. It should include using music as a therapeutic tool in clinical experiences to maximize the effectiveness of music in medical education. Ultimately, this approach holds the potential to substantially deepen students' comprehension of humanism in medical practice and enhance patients' interactions with healthcare providers, thereby improving overall patient experiences.

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Conflicts of Interest Disclosure

There are no conflicts of interest to declare.