

Neonates in intensive care units: the healing harmony of pediatric recovery

Recém-nascidos em unidades de cuidados intensivos: a harmonia curativa da recuperação pediátrica

Rebeca Tenajas¹  and David Miraut^{2*}

¹Family Medicine Department, Arroyomolinos Community Health Centre, Arroyomolinos; ²Advanced Healthcare Technologies Department, GMV Innovating Solutions, Madrid, Spain

Dear Editor,

After carefully reading Dr. Areiras' article¹, it has come to our attention that the pleasant, gentle background music in neonatal Intensive Care Units (ICU) plays a far more significant role than mere relaxation in aiding babies to fall asleep. As outlined in Dr. Areiras' inspiring article, there is scientific evidence that supports a robust correlation between music and the neurophysiological behavior and development of neonates and children, as well as a measurable enhancement in their recovery. Incorporating music therapy in the Newborn Individualized Developmental Care and Assessment Program (NIDCAP) and neurodevelopment-centered care programs usually provides both the benefits of music therapy and it facilitates vocal parental interaction with their preterm babies, which nurtures parent-baby bonding, especially amidst the challenging circumstances surrounding preterm births.

Due to the sterile and technology-dependent nature of intensive care units, they may lack elements that support the emotional and physiological well-being of their young patients. Music has the potential to fill this gap with its capacity to influence emotions and physiology. It is worth reflecting on the fact that from as early as 20-25 weeks of gestation, a fetus begins to respond to a mother's voice, heartbeat, and movements. Preterm

infants are deprived of these enriching intrauterine experiences, revealing a gap that music therapy could help bridge. The influence of early auditory experiences on brain development cannot be overstated, presenting a compelling case for the inclusion of music therapy in neonatal care.

Several studies have shown that exposure to music can trigger physiological responses in the body. For instance, Thoma et al.² discovered that listening to music can reduce the cortisol response, the primary stress hormone in the body. These observations have been affirmed by further research conducted in neonatal ICUs^{3,4}. This reduction in stress can be particularly beneficial in a hospital setting, where stress and anxiety are common for both patients and their families.

Most studies find positive outcomes when employing music, promoting more stable sleep patterns⁵ while diminishing agitation, crying, stress, and pain-related behavior. Similarly, research concurs on the fact that music encourages feeding⁶, thereby impacting weight gain and reducing hospital stay duration. This is particularly significant for premature infants, who cannot be discharged until they reach a minimum weight and are able to self-feed.

Music also has the potential to influence patient homeostasis. In neonatal intensive care units, music

*Correspondence:

David Miraut
E-mail: dmiraut@gmv.com

Received: 15-08-2023

Accepted: 16-07-2024

<https://pjp.spp.pt>

Available online: 05-08-2024

Port J Pediatr. 2025;56(2):125-127

DOI: [10.24875/PJP.23000013](https://doi.org/10.24875/PJP.23000013)

2184-3333 / © 2024 Portuguese Society of Pediatrics. Published by Permayer. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

has been beneficial in stabilizing neonates' vital signs⁷. The choice of calming music, especially lullabies, can contribute towards regulating heart rates and breathing⁸ in neonates. The timing of music therapy, especially in relation to the newborn's sleep stages, should be taken into account so as to maximize its benefits. Music therapy can be effectively combined with other methods, such as kangaroo mother care, non-nutritive sucking, or exposure to the smell of breast milk, thereby involving the family in the care process and enhancing the therapeutic outcomes.

However, while lullabies are a popular choice, we should also consider cultural diversity and individual preferences when selecting music. Different cultures have their own soothing songs that can be equally effective. Integrating music choice with the patient's cultural environment can enhance the effectiveness of musical intervention.

Beyond the physiological effects, music can also play a role in patients' emotional recovery. In pediatrics, where children may face traumatic situations, music can offer a means to express and process emotions. Thus, while soft music may be suitable for neonates, older children can benefit from a wider range of musical stimuli, including songs with lyrics they can identify with and relate to⁹. Music therapy serves as a tool for both relaxation and physiological regulation, and a medium for emotional expression and recovery. The multiple benefits of its usage underscore its value as an integral component of comprehensive pediatric care.

Moreover, the family, who are often the primary support system for pediatric patients, can also benefit from musical interventions, far beyond mere entertainment. Shared musical sessions can facilitate bonding, offer a reprieve from the stress of hospitalization, and promote a positive environment conducive to healing¹⁰.

Unfortunately, most of the published studies cover very small sample groups, leading to substantial statistical variability between them (potentially exacerbated by different intervention and data collection methods); so, caution must be exercised when extrapolating their promising results.

Incorporating music in the ICU offers a non-invasive and therapeutic means to support both physiological and emotional patient recovery. In view of the fact that music therapy is a cost-effective, low-risk intervention, we can expect that comprehensive, well-designed, larger-scale studies will be undertaken to evaluate these parameters in a precise and evidence-based way, offering clinicians insights into the application of music therapy in neonatal and pediatric intensive care units.

Acknowledgments

We wish to express our sincere thanks to the reviewers whose detailed and constructive feedback was invaluable in the revision of our manuscript. Their expertise and thoughtful suggestions have greatly contributed to the enhancement of our paper, allowing us to address important aspects more effectively and to present our findings in a clearer, more comprehensive manner. We are truly grateful for the time and effort they dedicated to our manuscript, and for guiding us towards improving the quality of our letter to the editor. Their expertise and dedication are truly appreciated.

Author contributions

R. Tenajas: Conception and design of the study, report, review or other type of work or paper; Acquisition of data either from patients, research studies, or literature; Analysis or interpretation of data either from patients, research studies, or literature; Drafting the article; Critical review of the article for important intellectual content; Final approval of the version to be published; Agreement to be accountable for the accuracy or integrity of the work. D. Miraut: Conception and design of the study, report, review or other type of work or paper; Drafting the article; Critical review of the article for important intellectual content; Final approval of the version to be published; Agreement to be accountable for the accuracy or integrity of the work.

Funding

None.

Conflicts of interest

None.

Ethical considerations

Protection of humans and animals. The authors declare that no experiments involving humans or animals were conducted for this research.

Confidentiality, informed consent, and ethical approval. The study does not involve patient personal data nor requires ethical approval. The SAGER guidelines do not apply.

Declaration on the use of artificial intelligence. The authors declare that no generative artificial intelligence was used in the writing of this manuscript.

References

1. Areias JC. The Art of Music and the Art of Medicine. *Portuguese Journal of Pediatrics*. 2023;54. doi:10.25754/pjp.2023.29333
2. Thoma MV, La Marca R, Brönnimann R, Finkel L, Ehlert U, Nater UM. The effect of music on the human stress response. *PLoS one*. 2013;8: e70156.

3. Martínez Verónica R, Gutiérrez Padilla JA, Petersen Uribe Á, García Hernández HA, Ávalos Huizar LM, González HG, et al. Musicoterapia en una Unidad de Cuidados Intensivos Neonatales: experiencia benéfica para el binomio. *Perinatol Reprod Hum*. 2015;29: 95–98. doi:10.1016/j.rph.2015.12.002
4. Schwillling D, Vogeser M, Kirchhoff F, Schwaiblmair F, Boulesteix A-L, Schulze A, et al. Live music reduces stress levels in very low-birthweight infants. *Acta Paediatrica*. 2015;104: 360–367.
5. Keith DR, Russell K, Weaver BS. The Effects of Music Listening on Inconsolable Crying in Premature Infants. *Journal of Music Therapy*. 2009;46: 191–203. doi:10.1093/jmt/46.3.191
6. Velasco Conde S. Musicoterapia con neonatos prematuros en la Unidad de Cuidados Intensivos Neonatales. <http://purl.org/dc/dcmitype/Text>, Universidad de Valladolid. 2016. Available: <https://dialnet.unirioja.es/servlet/tesis?codigo=138151>
7. Loewy J, Stewart K, Dassler A-M, Telsey A, Homel P. The effects of music therapy on vital signs, feeding, and sleep in premature infants. *Pediatrics*. 2013;131: 902–918.
8. Foroushani SM, Herman CA, Wiseman CA, Anthony CM, Drury SS, Howell MP. Evaluating physiologic outcomes of music interventions in the neonatal intensive care unit: a systematic review. *J Perinatol*. 2020;40: 1770–1779. doi:10.1038/s41372-020-0756-4
9. Thorn AC, Brown K, Tolland M, Read J. Pediatric staff and their perceptions of music therapy services. *J Pediatr Nurs*. 2023; S0882-5963(23)00204-X. doi:10.1016/j.pedn.2023.08.001
10. Haslbeck FB, Bassler D. Clinical practice protocol of creative music therapy for preterm infants and their parents in the neonatal intensive care unit. *JoVE (Journal of Visualized Experiments)*. 2020; e60412.