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# Assessing HeartSong as a Neonatal Music Therapy Intervention

## *A Qualitative Study on Personal and Professional Caregivers' Perspectives*

Nienke H. van Dokkum, MD, PhD; Lauren J. Fagan, MS, LCAT, MT-BC; Marie Cullen, RN; Joanne V. Loewy, DA, LCAT, MT-BC

### ABSTRACT

**Background:** The music therapy HeartSong intervention pairs newborn infant heartbeats with parents' Song of Kin. Formal evidence on professional and personal caregiver perspectives of this intervention is lacking.

**Purpose:** This survey study evaluates the HeartSong music therapy intervention from parent and staff perspectives.

**Methods:** A qualitative study assessing inclusion of HeartSong for family neonatal intensive care unit (NICU) care surveyed 10 professional caregivers comprising medical and psychosocial NICU teams anonymously reflecting their impressions of the intervention. Digital survey of parents/guardians contacted through semistructured phone interviews relayed impressions of recordings: subsequent setup, Song of Kin selection, and use of HeartSong, including thoughts/feelings about it as an intervention.

**Results:** Professional and personal caregivers valued the HeartSong intervention for bereavement support, family support, including parental, extended family/infant support, and to enhance bonding. Emergent themes: memory-making, connectedness/closeness, support of parent role, processing mental health needs of stressful NICU days, and subsequent plans for lifelong HeartSong use. Therapeutic experience was named as a crucial intervention aspect and participants recommended the HeartSong as a viable, accessible NICU intervention.

**Implications for Practice and Research:** HeartSong's use showed efficacy as a clinical NICU music therapy intervention for families of critically ill and extremely preterm infants, when provided by trained, specialized, board-certified music therapists. Future research focusing on HeartSong in other NICU populations might benefit infants with cardiac disease, parental stress, and anxiety attending to parent–infant bonding. Costs and time benefits related to investment are needed before implementation is considered.

**Key Words:** bonding, heartbeat recording, legacy, music therapy, neonatal intensive care unit, qualitative research

Infants born prematurely or critically ill are typically admitted to the neonatal intensive care unit (NICU). NICU admissions are stressful for both the infant and their personal caregivers/parents, as they may have an altered or limited parental

role—which is a critical stressor.<sup>1</sup> The disruption of care for an infant resulting from illness severity or limited NICU access perpetrates distance between parent and infant.<sup>1</sup> Parental stress is negatively associated with infant outcomes<sup>2</sup> and parent–infant bonding<sup>3</sup> for mothers, as well as fathers.

Notably, music therapy interventions and music-based interventions in the NICU have received recent, growing attention.<sup>5–11</sup> It is important to distinguish music-based interventions from music therapy. Music therapy is “the clinical and evidence-based use of music interventions to accomplish individualized goals within a therapeutic relationship by a credentialed professional who has completed an approved music therapy program.” Although music-based interventions may show efficacy, inclusion of a therapeutic relationship with a credentialed professional is not always included. Music-based (music medicine) and music therapy interventions with infants have collectively shown profound effects, such as physiological parameters including regulated heart rate, oxygen saturation and respiratory function, and improved behavioral states and feeding tolerance.<sup>5–11</sup>

Since the early 1970s, music therapy has had an international presence in North America, South

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America, Asia, and Western Europe,<sup>12</sup> with a variety of models showing efficacy for both neonates and parents.<sup>13-15</sup> Music therapy in a NICU setting has fostered parent–infant bonding<sup>16</sup> and reduced maternal anxiety.<sup>17-19</sup> The “First Sounds: Rhythm, Breath and Lullaby” (RBL) model highlights live music therapy interventions for infants, caregivers, and the environment<sup>12</sup> through live audio-recreation of the intrauterine environment by providing familiar womb sounds, such as intrauterine fluid, and the predictable and rhythmic stability of the heartbeat. The heartbeat’s natural musical elements (rhythm) and the whoosh of the uterus have established RBL as a music-based intervention in music therapy. Studies indicate that the heartbeat will aid the infant’s memory, which can foster predictability that is reminiscent of the maternal heartbeat and soothing for recovery postsurgery.<sup>20-22</sup> The heartbeat functions as the first musical introduction eliciting entrainment between parent and child.<sup>12</sup>

At a large urban medical center, the music therapists of the Louis Armstrong Center for Music and Medicine have developed and implemented the HeartSong. The HeartSong intervention is based on the pioneering work of Schreck (Cincinnati Children’s Hospital, 2013), who first recorded intrauterine sounds and incorporated them into composed and prerecorded music in close collaboration with parents in perinatal palliative care and hospice treatment.<sup>23</sup> Its current development has recently been renamed Amplified Cardio-Pulmonary Recordings.<sup>24</sup> To address the common parental experiences of anxiety, isolation, detachment, and hopelessness,<sup>25-27</sup> the HeartSong intervention synchronizes the intimate and familiar sounds of the newborn infant’s heartbeat, with a family’s chosen Song of Kin.<sup>28</sup> A Song of Kin is a parent-selected piece of music that is well known to the family through tradition, popular repertoire, or from their expressed cultural relevance, and is composed into a meaningful, developmentally meaningful lullaby.<sup>28</sup> The Song of Kin is an orienting theme intended to accompany both the infant and the family throughout major life events.<sup>28</sup> The HeartSong, implemented by a board-certified music therapist, is constructed by recording the heartbeat with a digital stethoscope, editing the sound quality, and recording the adapted Song of Kin with the heartbeat functioning as a grounding rhythmic loop. At our center, the HeartSong is mainly offered to parents of infants that are critically ill or born extremely preterm. The HeartSong is provided to parents as an audio file (see Supplemental Digital Content 1, available at: <http://links.lww.com/ANC/A203>, and Supplemental Digital Content 2, available at: <http://links.lww.com/ANC/A204>). Once completed, it is imperative that the music therapist continues to process the HeartSong within the context of a music psychotherapeutic relationship

for the duration of the infant’s admission to the NICU. Processing within music psychotherapy sessions safeguards pertinent themes, such as guilt, fear, or worry, pertaining to the often fragile parents.<sup>28</sup>

Formal evidence on professional and personal caregivers’ perspectives on the HeartSong music therapy intervention is lacking. This article aims to describe the intervention and indicate the areas of need relevant to fragile treatment needs. This may prompt other NICUs to implement HeartSong in a way that incorporates the needs of medical teams and the parents together. As such, our aim in this survey study, the first of its kind, is to evaluate the HeartSong music therapy intervention for family care in and beyond the NICU from a parental and NICU staff perspective.

### What This Study Adds

- The HeartSong music therapy intervention combines the recorded heartbeat with a parent-selected Song of Kin and was deemed supportive from both a professional caregiver and a parental perspective.
- Our study provides insight into professional caregivers and parental perspectives on this intervention.
- The HeartSong is recommended for clinical use in the NICU supporting bereavement and anticipatory grief as well as NICU parents, extended family, and infants, with a specific focus on bonding support through therapeutic relationships.

## METHODS

### Setting and Population

Our qualitative study gathered 10 caregivers’ and 10 parents’ perspectives on the HeartSong music therapy intervention. We aimed for a maximum variation sample, a method designed to represent a broad range of experiences, rather than numerical representativeness.<sup>29</sup> The 20 participants were deemed logistically feasible, and we did not target theme saturation. Professional caregivers—medical and psychosocial staff in NICUs at Mount Sinai Hospitals—were provided a digital survey with open-ended questions. Personal caregivers selected from parents/guardians who had received a HeartSong intervention within the past 2 years represented purposely selected samples of diverse medical situations and varying time spans since discharge were targeted. Personal caregivers contacted by phone were asked to participate in a short semistructured interview conducted in their native language and a review board–approved translator was utilized when needed. Both the survey and the interview covered the following topics (for semistructured interview guide, see Supplemental Digital Content 3, available at: <http://links.lww.com/ANC/A205>): information provision, heartbeat recording process, Song of Kin selection process, use of the HeartSong, and thoughts

and feelings with respect to the HeartSong. The study was approved by the Institutional Review Board of the Icahn School of Medicine (STUDY-22-00325). A member of the music therapy team requested parent participation. Written informed consent was received from all participants.

### Qualitative Analyses

Interviews with personal caregivers were audio-recorded upon consent. All study participants were informed that their data would remain confidential and anonymous. Interviews were conducted primarily by the first author, N.v.D., a female MD/PhD candidate. All recordings were transcribed verbatim and then checked by the second author, L.F., a female licensed creative arts therapist and a board-certified music therapist. The final author (J.L.) served as the supervisor and inquiry author. The researchers received training in interviewing and qualitative research through their respective educational institutions. Survey responses and interviews were processed using Atlas.ti, through inductive and deductive coding, based on a phenomenological approach. Two of the researchers (N.v.D. and L.F.) subsequently engaged in discussions seeking to refine overall themes, subthemes, and categories, using a thematic approach, based on the semistructured interview guide. Contradictory data present in the themes were displayed in the results.

## RESULTS

### Participants

Professional caregivers included 2 physicians, a registered nurse, a physical therapist, 2 social workers, 2 chaplains, a child-life specialist, and a former NICU music therapist. Each subject indicated that they had received information on the HeartSong intervention through the music therapy program or from direct colleagues within their own discipline. Parents included 9 mothers and 1 father. Three of the 10 parents experienced their infant's death in the NICU. Most of the parents had experienced particularly critical situations during their NICU stay: extreme prematurity, congenital abnormalities, extended stays, and the Covid-19 pandemic. We will address the main themes gleaned from the surveys and interviews: bereavement support, family support, bonding support, and therapeutic experience. Quotes supporting the findings are listed in Table 1.

### Bereavement Support

HeartSong was implemented in our 2 NICUs to provide bereavement support. End-of-life issues were found to be an overriding reason for referral across disciplines. Several subthemes within bereavement support were noted.

### *Legacy, Memory Building, and Longevity of the HeartSong*

Almost all professional caregivers were aware of the legacy and memory-building intentions of HeartSong—reporting on the context of bereavement support. Subjects referenced the need for documenting a child's life. HeartSong may enhance legacy initiatives—providing a way to identify and capture in real time, the life of the infants rather than a mere remembrance of illness within their NICU stay. HeartSong may form a lifelong and lasting keepsake for parents.

### *Feelings of Connectedness*

Although not all parents who had lost their infant during NICU stay were emotionally ready to discuss the HeartSong and its personal and private meaning in depth, it was evident that all of them appreciated the HeartSong. HeartSong's use in a few bereaved parents differed from the mainstream responses. One of the mothers stated having listened to the HeartSong frequently, while another stated not having listened to it at all. From the parental perspective, a memory of a child's life may evoke feelings of connectedness, particularly when facing death. One bereaved parent appreciated that the HeartSong enabled her to still hear her son's heartbeat. From a professional caregiver's perspective, connection also arose as an important perceived benefit for bereaved parents. A social worker mentioned valued connection between parent and newborn.

### *Emotional Support for Perinatal or Neonatal Loss*

The process of the HeartSong intervention, including the heartbeat recording, may support parents emotionally during a time of active perinatal or neonatal loss, where the recording process may be prioritized to capture the heartbeat. In case of perinatal loss, intrauterine Doppler heartbeats integrated into the HeartSong can facilitate coping with anticipatory grief. One of the bereaved parents interviewed received a modified HeartSong, as her infant was not expected to survive birth, describing the process of receiving her HeartSong as emotional. From a professional caregiver perspective, supporting grief was mentioned multiple times as an important incentive for providing HeartSong. A chaplain interviewee introduced the concept of "spiritual healing through music" valuing its potential in perinatal/neonatal loss.

### Family Support

A second area of support identified by both professional and personal caregivers was family support. Although primarily support is offered for parents through this music therapy intervention, extended family members most thought also benefit from the HeartSong intervention.

TABLE 1. Quotes Supporting the Findings of This Qualitative Study Categorized by Themes and Subthemes

<b>Bereavement support</b>	
Legacy, memory building, and longevity of the HeartSong	
<i>[The HeartSong is] a lasting and unique way to capture a keepsake of their baby's journey or, in bereavement, a precious aspect of their baby's life.</i>	Social worker
Feelings of connectedness	
<i>Well [Name] has died and so the HeartSong is so meaningful, because (...) it's the only way we can hear his heartbeat still. [The HeartSong is] the greatest gift we have received during this time.</i>	Mother no. 3
<i>I think they have really enjoyed having that connection with their newborn, especially in the situations that their baby does not survive. They have shared with me that it has been supportive and memorable for them and their whole family.</i>	Social worker
Emotional support for perinatal loss	
<i>It was beautiful when the heartbeat was recorded and this was very emotional for me. I am very grateful to everybody from art and music therapy, everyone was really professional and they were all caring for me. The music therapist and I created a soundscape, I guess mostly chords, that was like done with the heartbeat.</i>	Mother no. 10
<b>Family support</b>	
Parent support	
<i>HeartSongs are powerful and meaningful. Identifying a song of kin affirms parents' role and identity as parents. This is then transformed into an evocative and present memory of their child's life, especially when a child dies. I can think of nothing more powerful and long-lasting than this living document of their child's life.</i>	Chaplain
<i>I feel that caregivers value the opportunity to create music with their infant's heartbeat, as it gives them agency through music during a time when many of their typical caregiving duties may feel stripped away.</i>	Music therapist
<i>To be completely honest, when I'm at home and sometimes I'm feeling down stuff I just I play it and I just listen to it and then go right, she's my motivation. I have to continue what I do for her and then hearing that just lifts me up more and it just makes me like push harder for her not only for myself, but for her.</i>	Mother no. 2
<i>[The HeartSong] almost was more for me than it was for [Name]. I feel like I use it myself a lot and through my company and singing, I could trust that I was sort of a vehicle of co-regulation for [Name]. And so I really used it primarily actually, when I was nursing. (...) I played that song a lot around when I would nurse him near the pillow. (...) Still play it when we're in the car and um, I have my phone and I can access it easily on my phone. And he loves it.</i>	Mother no. 6
Extended family support	
<i>Yeah, I did share it with my parents and with my husband's parents when they visited actually but so it really just had to stay within our or more sort of immediate family system.</i>	Mother no. 6
<i>No [we haven't shared it with anyone], not yet. Eventually we will. Because we haven't had too many large gatherings yet. That you know as time goes on, we know we start you know, opening up the story to more of our family and friends and that will be part of it. Eventually we will do like or even like, video or the photos of baby in chronological order, and you know, obviously put the song in there.</i>	Father no. 1
Infant support	
<i>The father, we know we don't live together but when the father comes in or when [Name] is over there we claim to know what like for him to sleep or like for him to sooth like he's cranky. You know, so we're able to put that but some other things but we use that allowed for him to live as a relaxation.</i>	Mother no. 4
Lifelong use of the HeartSong	
<i>So I was sort of reflecting the ways in which I wanted to use his first birthday as a way of defining what letters do I want to write to him and actually think about you know, just really like right on that day and I think I definitely my intention is to really incorporate [the HeartSong] as he goes older and I think I have a little memory box of things that I want that hold a lot of meaning and want to go over with him as he gets older and so continuing to incorporate the song for him to especially as he starts to develop language and be able to understand what a heartbeat is. Really cool. Really special.</i>	Mother no. 6
<b>Bonding support</b>	
Feelings of closeness	
<i>Yeah, because she's still here. So that's what makes her close when I'm at home and I'm not with her. (...) And it still gives you that closeness even if you miss a day and you can't come because you know you still have to do other things outside even though I feel guilty but I still have that part with me.</i>	Mother no. 2

(Continues)

**TABLE 1. Quotes Supporting the Findings of This Qualitative Study Categorized by Themes and Subthemes (Continued)**

<b>Song of Kin</b>	
<i>So the song was “you’re my strength.” It was a song that we sang and played for him in vitro while he was still inside the womb. And being as he was born early. He faced a lot of challenges. And it was just something that when we would go into the NICU, we would sing it for him especially on his toughest days. And to us, it seemed like he would get stronger whenever he whenever he would hear it. So it just became this song even so this day, we sang it for him.</i>	Mother no. 7
<i>A HeartSong recording provides opportunities for caregivers to bond with their infant through their preferred music. (...) Additionally, I feel caregivers value the opportunity to bond with their infant by allowing caregivers the opportunity to create meaningful moments, even within the hospital/NICU setting.</i>	Music therapist
<b>Therapeutic experience</b>	
<i>My impression overall is that like it’s so unique, that it is just nothing like it really is. Music I think has this way of touching so many different senses, and therefore really imprints memory and hold the facts or information and memories so tightly and so to combined. The power of music, the healing power of music, with nothing more intimate than the very magical sound of a heartbeat is so profound.</i>	Mother no. 6
<i>(...) she said that, you know, I could take your heartbeat along with the baby’s heartbeat and put it into a song and she said that she could sync it up and I said of course and what I found amazing was the words that she said she said what was so beautiful about creating this particular song was the fact that me and my son’s heartbeat synced so well.</i>	Mother no. 5
<i>I think it was something that I think they should be incorporated into, you know, especially in NICU because, you know, the baby’s already gone through so much. (...) I think it’s something definitely should be expanded more. (...) For adults when they’re in the hospital [too]. Because remember, when my wife was in the, in the intensive care that she was in the coma, but I will play I will play her songs from my phone because I know that it’s good to keep the brain activity going.</i>	Father no. 1
<b>Experiencing the heartbeat recording</b>	
<i>It was such a beautiful experience that I remember (...) You will come in five years from now and I’m gonna remember because it’s such a special moment that I experienced the heartbeat and everything.</i>	Mother no. 4
<i>Creating the heartbeat recording is an emotionally enriching experience, as it reminds us that we are all connected through the rhythms of life and that our own physiologic rhythms can create musical memories that have the capacity to transcend time and space. (...) and to create a transitional object that can serve as a powerful therapeutic tool as one processes significant milestones related to their infant.</i>	Music therapist

**Parent Support**

The HeartSong was perceived by staff as beneficial for parents’ capacity to cope with NICU-related stress. Many professional caregivers expressed the wish to have HeartSong interventions available for all admitted NICU infants. Importantly, professional caregivers also indicated affirmation of the parental role and their identity as parents as one of the main constituents of the Song of Kin<sup>28</sup>—an integral part of the HeartSong. This was particularly evident by statements from chaplaincy and music therapy.

Parents deemed the HeartSong intervention supportive as well in helping them cope with the NICU experience in general. Many parents expressed their gratitude to the music therapy team in general but specifically for the opportunity to utilize their HeartSong postdischarge. An important part of the supportiveness of the HeartSong intervention mentioned by parents was individualized care and adaptations by the music therapist. For some parents, that meant extensive explanation about the HeartSong intervention was not necessary, and for other parents, it meant that describing the process in great detail made them feel more involved.

Modifications implemented in the HeartSong individualized music therapy treatment, such as incorporating parental heartbeats and parents’ recorded voices.

A father recalled such modification based on a situation in which both his wife and his son were admitted to different ICUs. His wife was sedated antepartum and did not have recollection of the birth or the first days of life. The music therapist created a modified version of the HeartSong by incorporating both infant and maternal heartbeats. Upon regaining consciousness, the mother identified a Song of Kin, which was explored musically and verbally upon being presented both synchronized heartbeats. The father explained that wording mattered and that such a Song of Kin took them back to specific moments that helped them reflect upon the chronology of events and enhanced their coping with the situation.

The HeartSong was also described as a motivator for continuing to support a preterm infant during difficult moments in the NICU multiple times. After discharge, HeartSong continued to support parents at home, described as a reminder of how far their infant had come, surviving the NICU. In addition, one of the mothers mentioned how listening to the HeartSong during feeding and sleeping supported relaxation for both her and her infant.

**Extended Family Support**

Extended family members such as grandparents, aunts and uncles, or even close friends may benefit from the

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HeartSong, particularly during times of limited visitations, such as in the Covid-19 pandemic—where visitation policies were limited. Almost all parents referenced sharing the HeartSong with their extended family, involving them in the NICU stay to continue family bonding. For some, this meant sharing the HeartSong with extended family and friends, while for others it meant sharing with only immediate family due to its personal and intimate nature. Extended families that participated in the sharing of HeartSong felt involved and much enjoyed the offering. Sharing these intimate details with extended family affirmed parental control over this intervention: they choose what to do with the HeartSong and if and when to share.

### *Infant Support*

Parents perceived music therapy and the HeartSong intervention as beneficial for their infant as well as themselves. A father interviewed described beneficial effects of the HeartSong for his son during the Covid-19 pandemic where his wife was admitted to the intensive care unit and his son was admitted to the NICU. Both parents were unable to visit their son. He stated that they put the music in a “music machine” and that the medical staff would play the music for his son. This would relax the infant as he would recognize his mother’s heartbeat, making it, according to him, an important part of the healing process. This father explained the soothing, calming effects of the HeartSong during the NICU stay and also beyond NICU time. In addition, the registered nurse mentioned a meaningful impact of the HeartSong for infant development through healing and comfort.

### *Lifelong Use of the HeartSong*

Many parents described their intentions to use the HeartSong as a lifelong keepsake and that they would favor their child having access to it throughout their lives—as a reminder of the NICU time. One mother thought of a multigenerational use of the HeartSong and planned on showing it eventually to her grandchildren—to explain her son’s NICU experience. Staff members too found HeartSong’s lifelong use as a main benefit concept.

### **Bonding Support**

Bonding support was expressed by both professional caregivers and parents as a significant theme in using HeartSong to evoke feelings of closeness. The Song of Kin was a crucial aspect, providing parents with a forum for continued connection postbirth.

### *Feelings of Closeness*

The feelings of inevitable separation were mentioned repeatedly by parents. One of the mothers stated that listening to the HeartSong “made the situation easier” as it served as a forum whereby

she wanted to express that leaving the NICU was easier when she would be able to take a part of her infant home with her. Feelings of guilt for leaving the infant in the NICU were described quite often and the HeartSong would provide a feeling of closeness to the infant even as the mother would leave the infant behind. If a parent was not able to visit the NICU due to living distance, conflicting work schedules, or illness, the HeartSong sustained feelings of closeness.

### *Song of Kin*

Parents often chose the Song of Kin based on specific events. For example, in naming the child after a specific song, that chosen song represented an important life event or significant period of time, or of singing and playing the song during pregnancy. The Song of Kin served a continuum throughout the NICU admission and transitional orienting theme postdischarge. For professional caregivers, bonding support was identified as a primary use of the HeartSong.

### **Therapeutic Experience**

The uniqueness of the HeartSong intervention in its psychotherapeutic nature during NICU stay was underlined by parental therapeutic experiences. The psychotherapeutic processing of the HeartSong intervention may serve as a forum for parents’ emotional release, while at the same time, as an affirmation of expression, enhancing their capacity to cope. These experiences described as positive prompted parents’ gratitude for the space to process their emotions. Trust and guilt were common emergent themes in music therapy, and parents said that music and the therapist words mattered and stuck with them.

### *Experiencing the Heartbeat Recording*

The heartbeat recording process was an important part of HeartSong. Although most parents had good experiences with this process, one of the mothers talked about her infant’s major bradycardia and desaturation and recalled the subsequent resuscitation setting that occurred during the recording process. Although this is a frequent experience, and seemingly unrelated to the recording process, as per the infant’s medical diagnosis, she described that as stressful but afterwards was appreciative that the recording succeeded. Other parents described the beauty of being present. Professional caregivers were not present during the heartbeat recording aside from the music therapist.

## **DISCUSSION**

This qualitative study aimed to evaluate the HeartSong music therapy intervention from a professional

and personal caregiver perspective. Our findings demonstrate that the HeartSong is a valuable intervention in bereavement support, parent support, family support, and bonding support. The continued therapeutic relationship utilizing the HeartSong intervention within music therapy was described as integral. Finally, the HeartSong intervention was recommended for use in the NICU by both personal and professional caregivers.

Bereavement was the first area of support where the HeartSong was identified by both professional and personal caregivers in legacy and memory building, enhancing feelings of connectedness, which is supported by literature from pediatric palliative care. Schreck et al<sup>30</sup> described that parents of children with neurogenerative disorders felt that a living memory, that is, heartbeat recording, was more powerful than a static memory (eg, photographs and locks of hair), and knowing that the recording was there was comforting in itself. Others report on the use of their version of a heartbeat intervention, showing that the use is variable and that parents are grateful for the gift of this intervention.<sup>31</sup> Reactions in bereavement and anticipatory grief for NICU parents include preoccupational thinking or dreaming about their infant, feelings of sadness, and/or anger.<sup>32</sup> Legacy making through the HeartSong intervention, which includes a therapeutic relationship, may assist parents in their processing anticipatory grief and/or bereavement.<sup>31</sup>

HeartSong was also endorsed by professional and personal caregivers in family support, with accentuated affirmation of the parental role cited during times of high stress. A systematic review indicates that mental health problems such as feelings of guilt and shame as well as symptoms of anxiety and stress are common in the NICU.<sup>33</sup> The alteration of the parental role is recognized as a stressor for parents during their NICU stay.<sup>1</sup> Although anxiety decreases during NICU stay for mothers,<sup>18</sup> music therapy interventions and specifically the HeartSong may provide support for both parents after a NICU stay.

Emotional fragility and retraumatization can evoke symptoms of posttraumatic stress for NICU parents.<sup>34</sup> Continued use of HeartSong during such time may prolong coping and processing of the NICU period, as our findings indicate.

Bonding support was another area where the HeartSong was deemed a valuable intervention, evoking feelings of connectedness and closeness particularly when parents could not visit. Bonding is crucial in a healthy parent–infant relationship and fundamental in infant’s development later in life.<sup>16</sup> Attachment may be at risk when bonding is impaired by mental health problems in parents.<sup>16</sup> Engagement in music therapy through not only listening to recorded music but also participating in the therapeutic processing may be what facilitates the bond between parent and infant. Within this conception, the Song of Kin may be crucial, as parent-preferred music is transformed into a lullaby and processed within a music psychotherapy session context.<sup>28</sup>

### Strengths and Limitations

This study is a first to assess both parental and professional caregiver perspectives on the HeartSong as a music therapy intervention. Parental perspectives on music therapy interventions are surprisingly scarce and they may actually refine an intervention’s capacity to support NICU families. We believe that the HeartSong may be beneficial for NICU families across the world, in different cultures, because the heartbeat is such a fundamental part of an infant and when paired with the Song of Kin, the experience can be culturally meaningful. A limitation of the study is the small number of professional caregivers and parents, and the selection of included parents and professional caregivers was based on availability, which might have introduced selection bias. The sample is representative of varying cultures and diagnoses typical of NICU populations. We did not member-check, which may have influenced the findings. Large-scale studies would validate the findings of this study.

### Summary of Recommendations for Practice and Research

What we know:	<ul style="list-style-type: none"> <li>• The NICU stay of a critically ill infant takes its toll on parental mental health and parent–infant bonding.</li> <li>• Music therapy interventions may support parents in this situation.</li> <li>• The HeartSong music therapy intervention combines the recorded heartbeat with a parent-selected Song of Kin and was deemed supportive from both a professional caregiver and parental perspective.</li> </ul>
What needs to be studied:	<ul style="list-style-type: none"> <li>• Future studies should focus on the HeartSong intervention in other NICU populations and other critical care settings.</li> <li>• A qualitative study might include effects of the HeartSong on parents, that is, on anxiety and stress, as well as on parent–infant bonding.</li> </ul>
What we can do today:	<ul style="list-style-type: none"> <li>• Board-certified music therapists can implement HeartSong as a music therapy intervention in the NICU.</li> </ul>



## Recommendations for Future Clinical Practice and Research

The HeartSong intervention was valued in our NICU care and can extend beyond bereavement support to include the parents of other infants. Parents of infants with cardiac disease may benefit from HeartSong as its focus on the heartbeat identifies health rather than disease. The therapeutic experience, that is, verbally and musically processing of the HeartSong intervention after receiving it and using it to cope with the NICU stay, is a crucial aspect of the HeartSong intervention and can be provided by a board-certified music therapist. Knowledge about HeartSong, especially by neonatal nurses, may enhance care for parents in a NICU setting. Future research including qualitative and quantitative perspectives on interventions will elucidate how music therapy can best support parents. A further quantitative study might include effects of the HeartSong on parents, that is, on anxiety and stress, as well as on parent–infant bonding. The use of the HeartSong in different settings and for other populations should be further explored. Such studies should also include details on financial costs and time investment, which were not part of our current study.

## CONCLUSION

This study demonstrates the benefits of the music therapy HeartSong intervention for NICU settings. The HeartSong is deemed valuable for bereavement support, family support including parental, extended family and infant support, and bonding support. In addition, the therapeutic experience reflects a crucial part of this intervention. The HeartSong intervention was recommended by both parents and professional caregivers.

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