

MUSIC THERAPY FOR INFANTS WITH NEONATAL ABSTINENCE SYNDROME
IN THE NICU:
A QUALITATIVE CONTENT ANALYSIS

A Thesis
by
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Submitted to the School of Graduate Studies
at Appalachian State University
in partial fulfillment of the requirements for the degree of
MASTER OF MUSIC THERAPY

December 2019
Hayes School of Music

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Abstract

MUSIC THERAPY FOR INFANTS WITH NEONATAL ABSTINENCE SYNDROME IN THE NICU: A QUALITATIVE CONTENT ANALYSIS

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This study sought to describe how music therapists provide care for patients with neonatal abstinence syndrome and their caregivers. A small group of music therapists who worked with infants in neonatal intensive care units (NICU) were contacted via email and asked if they would consent to be interviewed. The four music therapists who responded first were interviewed. Each informant shared their experience through a semi-structured interview format that the researcher recorded and transcribed. The researcher extracted and analyzed 14 themes from the interviews, leading to a summary of results describing how music therapists to provide care for patients with NAS and their caregivers. Results of the study showed that the primary challenges faced by music therapists working with infants with NAS and their caregivers is lack of research and education with this population, as well as inconsistency among the medical community regarding treatment plans for the infants. Music therapists provide care for patients diagnosed with NAS and their caregivers by observing, assessing, and responding flexibly to their needs in the moment. They provide a variety of interventions based on the needs of the infant and caregiver which, anecdotally, results in infants who

sleep, eat, and soothe better, as well as caregivers who feel respected, encouraged, and empowered to care for their infant. Further research is needed to explore best practices and dosing of music therapy treatment for infants with NAS and their caregivers.

Acknowledgments

I would like to begin by acknowledging my internship supervisor, Danae Merrick, who sparked my interest in working with this population. She encouraged me to pursue this subject and provided more educational opportunities than were required in an effort to help me accomplish my goals. She went above and beyond her role as my internship supervisor to prepare me to complete this thesis, and I am grateful to her. Thank you, Danae.

Additionally, I would like to thank my advisor and thesis committee chairperson, Dr. Cathy McKinney. Her encouragement and belief in the importance of the study and my ability to complete it were invaluable to the process and the final product. She thoughtfully asked questions that challenged me to think more critically about the subject matter and remained hopeful when the challenge seemed too big to complete. I would also like to thank my thesis committee members, Dr. Christine Leist and Dr. Beth Fiske, for investing time and effort into this thesis. Their knowledge of the subject matter was critical to the process. Thank you, Cathy, Christine, and Beth.

To the informants of this study, Mary, Jessica, Joanne, and Daniel, thank you for your time, for sharing your knowledge and experience, and for the way you passionately change the world every day.

Finally, I would like to thank my husband, Matt, and my sisters, Rebekah and Bethany. They have endured my stress, tears, and excitement throughout the process of completing this project. They have listened to me, supported me, cheered me on, and

believed in me even when I was not sure I could complete the tasks at hand. Thank you,
Matt, Rebekah, and Bethany.

Table of Contents

Abstract	iv
Acknowledgments.....	vi
Chapter 1: Introduction	1
Chapter 2: Literature Review	7
Chapter 3: Method	14
Chapter 4: Results	17
Chapter 5: Discussion	27
References.....	34
Appendix A: Consent Form.....	38
Appendix B: Interview Questions.....	40
Vita.....	41

Chapter 1

Introduction

Neonatal abstinence syndrome (NAS) affects over 20,000 infants and their families each year in the United States (Tolia et al., 2015). Nationally, the incidence of NAS has grown five-fold since the year 2000 as the rate of substance and opioid use increases in the U.S. In the state of North Carolina, the incidence rate has grown from 0.3 per 1,000 births to 6.4 per 1,000 births in the 13 years from 2000 to 2013, which is a 21-fold increase (National Institute on Drug Abuse, 2015). This increase in incident rate has brought attention to the importance of treating patients diagnosed with NAS as effectively as possible.

NAS is caused by in utero exposure to drugs such as methadone, often prescribed by pain clinics, and primarily characterized by gastrointestinal and neurological symptoms such as diarrhea, vomiting, hypertonia, and tremors (Bio, Siu, & Poon, 2011). Additionally, infants diagnosed with NAS are more likely to be born prematurely than those without in utero drug exposure and may experience less severe symptoms if born prematurely as opposed to full-term (Bio et al., 2011). Pharmacological treatment for NAS is continually being studied and tested to determine what combination of solutions are best for infants in the weaning protocol. Some treatments may include diluted tincture of opium, oral morphine solution, or methadone (Bio et al., 2011). While pharmacological management of symptoms have been researched and found to be useful to infants with NAS, non-pharmacological management of symptoms is a topic which hospitals began exploring more recently with successful outcomes (Grossman et al., 2017).

For infants with NAS eating, sleeping, and soothing are all challenging developmental milestones to meet (Balakrishnan & Suresh, 2018). The delay in these milestones along with the physiological distress often lead to an extended hospital stay for NAS patients. Lengthy hospitalization directly after birth has been shown to cause stress on the infant, as well as the family. For mothers, the physical toll associated with childbirth is exacerbated by an unfamiliar environment, the emotional distress of having a child in the hospital, and exhaustion (Cevasco, 2008). Nurses often find NAS patients hard to care for, as they do not stay asleep very long, are often hard to soothe, and maternal presence at bedside can be limited due to substance use and their own efforts to wean off substances (Sweigart, 2017).

For the infants, prolonged exposure to high decibel levels in the neonatal intensive care unit (NICU) is correlated with negative long-term outcomes such as specific learning disabilities, lower IQ, attention-deficit disorder, anxiety, and hyperactivity (Standley & Walworth, 2010). Many NICU environments are not conducive to helping calm a patient with NAS. Noises from loud speakers or nearby conversations, sudden and bright lights being turned on in an adjacent bed space, and nurses who need to care for patients can startle an infant and result in excessive crying and irritability.

The psychosocial aspects surrounding an infant diagnosed with NAS are often complicated. While caregivers may not have the opportunity to be at the bedside very often, many mothers of NAS patients have expressed the feeling of being judged for their decisions and are particularly at risk for abandonment and attachment issues when they are present at the bedside (Balakrishnan & Suresh, 2018). However, many studies have shown the benefit of interventions such as kangaroo care, rooming-in, and parental empowerment on the length

of stay for infants in the NICU. Research has shown a reduction in the length of stay for NAS patients when these types of non-pharmacological interventions are a part of treatment protocol (Grossman et al., 2017). Along with nonpharmacological therapies such as physical therapy, occupational therapy, and speech therapy, music therapy is offered in many hospitals around the world (American Music Therapy Association, 2006; Bruscia, 2014).

Music therapists work across a variety of settings from developmental music therapy in educational settings to mental health settings, as well as children's medical settings. Many different techniques, theoretical orientations, and models have been developed and implemented to address specific goals for individuals and groups in these various settings. One of these groups is infants in the NICU. Music therapists can begin working with infants as early as 24 weeks gestational age (Gooding, 2010). Interventions used by music therapists in the NICU vary according to the infant's age and developmental level (Nocker-Ribaupierre, 2013). For instance, the only developmentally appropriate music therapy intervention for an infant who is 28-weeks gestational age is non-contact auditory stimulation. As the infant develops over time, other music therapy interventions become appropriate to incorporate. According to research, music therapists provide simple, repetitive, lullabies in a major key, at less than 65-75 dB, without causing harm and improving vital signs. As an infant continues to develop, auditory stimulation paired with vestibular and tactile stimulation are added to help the infant process sensory integration (Detmer & Whelan, 2017).

As the incident rate of NAS rises and healthcare providers explore the best way to serve these patients and their families, music therapists realize the need for more research to determine what methods are most effective. The purpose of this qualitative study is to

describe how music therapists provide care for patients with NAS and their caregivers. The subquestions asked in this study are as follows:

1. How do music therapists support caregivers of infants with NAS?
2. What interventions do music therapists use to treat infants with NAS?
3. How does music therapy treatment benefit patients with NAS?
4. What challenges do music therapists face in treating infants with NAS?
5. How might music therapy for infants with NAS manifest in the future?

Definitions

NICU music therapy. NICU music therapy is music therapy provided by a board-certified music therapist who has received specialized training to work with infants in the NICU of a hospital. NICU music therapy is provided only for infants who have been assessed as developmentally ready for music therapy intervention. The types of interventions used with infants in the NICU vary depending on their age, developmental level, and goals of care (Gfeller, 2008). Infants born prematurely may be referred to in terms of gestational age (the number of weeks since the mother's last menstruation) or corrected/adjusted gestational age. Corrected (or adjusted) gestational age is how old the infant would be, had they been full-term. For example, if an infant were born at 32 weeks gestational age (8 weeks short of 40 weeks) and is now 24 weeks old, the infant's corrected gestational age is 24 minus 8, which would be 16 weeks old.

For infants in the survival/pacification stage (24 weeks gestational age until the infant reaches 2.5 lbs), music therapy interventions are extremely limited to include only non-contact music listening below 70 dB. In the cautious stimulation stage (approximately 30 weeks gestational age), music therapists can provide developmental multimodal stimulation

to increase tolerance to stimuli. This intervention starts with minimal auditory, vestibular, and visual stimulation and slowly adds each layer as appropriate. At 32 weeks gestational age, music can be used to reduce stress signs and inconsolable crying and at 34+ weeks, contingent music may be used to reinforce nonnutritive sucking and aid a smooth transition from gavage feeds to nipple feeding (Gooding, 2010; Walworth et al., 2012).

Finnegan scores. When an infant is diagnosed with NAS, the treatment team uses a scoring system known as the Neonatal Abstinence Tool, developed by Laura Finnegan and sometimes referred to as the Finnegan score, to help assess and treat the infant's symptoms. This scoring system includes 22 items for assessment and gives 0–5 points depending on the item for symptoms related to NAS such as mottling, excessive crying, vomiting, diarrhea, fevers, etc. and the total number of all symptoms is the Finnegan score (Finnegan, Connaughton, Kron, & Emich, 1975). The total score ranges from 0 (*low symptoms*) to 44 (*high symptoms*). The Finnegan scoring system has received many modifications over the years among hospitals and institutions that utilize it (North Carolina Pregnancy and Opioid Exposure Project, 2018). Originally, Finnegan *et al.* proposed that infants with three consecutive scores greater than 8 or two consecutive scores greater than 12 receive pharmacological management. If an infant continuously received scores lower than 8, it was proposed they continue their pharmacological wean (Gomez-Pomar et al., 2017). Some controversy surrounds the use of a scoring system that also works as a diagnostic tool, but to date, the Finnegan score is still widely used to assess and treat patients with NAS (Grossborn, Osborn, Berkwitt 2017).

Pacifier Activated Lullaby. The device used to provide contingent music for infants is called the Pacifier Activated Lullaby (PAL®) machine. This machine is a small speaker

that connects to the infant's pacifier. When the infant produces an effective suck, a lullaby is played through the speakers (Hamm & Walworth, 2013). Infants typically begin developing the ability to coordinate sucking and breathing between 34–36 weeks gestational age (Lau, 2015). Lullabies promote a sense of safety, security, and relaxation in infants as they are generally slow (between 60–85 bpm), repetitive, and melodically simple (Nocker-Rebaupierre, 2004). The PAL® is used to help reinforce non-nutritive sucking, to help calm and soothe during and following painful procedures, and most recently, for infants diagnosed with NAS (Hamm & Walworth, 2013).

Chapter 2

Literature Review

The conversation surrounding NAS patients and how to best treat them is growing as the incident rate of NAS among infants also grows. Many researchers have argued that NICU environments are detrimental to infants with NAS, as they are often noisy, bright, alerting environments (Balakrishnan & Suresh, 2018; Grossborn et al., 2017; Grossman et al., 2017; Howard et al., 2017). The importance of addressing patient needs nonpharmacologically is not fully known; however, research has supported the use of music therapy as an effective noninvasive, nonpharmacological therapy (Teckenberg-Jansson, Huotilainen, Polkki, Lipsanen & Jarvenpaa, 2011). Grossman et al. found that the average length of stay was reduced from 22.5 days to 5.9 days when nonpharmacological interventions were prioritized for NAS patients and the use of morphine for patients was reduced from 96% to 14%, resulting in an average cost reduction of \$35,252 per patient. In addition to music therapy being an effective nonpharmacological intervention that can assist in reducing length of stay, the literature also described increased parental engagement as a benefit of music therapy interventions (Whipple, 2000).

Music Therapy as a Nonpharmacological Intervention

The use of music therapy with infants in the NICU is gaining recognition as an evidenced-based, nonpharmacological intervention that is beneficial to the infants as well as to their families and caregivers. (Cassidy & Standley, 1995; Cevasco, 2008; Standley & Swedberg, 2011; Walworth et al., 2012; Whipple, 2000). Cassidy and Standley conducted a

study to determine how auditory stimulation in the form of music was detrimental or helpful for premature infants. Their study included 20 low birthweight infants between 24–30 weeks gestational age. Using specially designed earphones, the experimental group was exposed to 16 minutes of music in 4-minute increments, alternating 4 minutes of music with 4 minutes of silence. The data were collected over a period of 3 days. The outcome of the study showed immediate improvement of the infants' oxygen saturation, respiratory rates, and heart rates for those in the experimental group. The authors concluded that while limited stimulation is recommended for premature infants, small amounts of developmentally appropriate music is not detrimental and could be useful in assisting with parent-infant bonding, as well as improving the physiological state of premature infants.

Teckenberg-Jansson et al. (2011) hypothesized that music therapy in addition to kangaroo care would be more beneficial for infants than kangaroo care alone. In a study that included 61 infants, between 24 and 36 weeks gestational age, the authors alternated dual music therapy and kangaroo care sessions with kangaroo care alone. The outcome showed that over time, these infants all showed a decrease in respiration rate, heart rate, and increase in O₂ saturation levels. However, during sessions with dual treatment of music therapy and kangaroo care, the infants' blood pressure was significantly reduced, as well. Additionally, parents reported feeling calmer and more relaxed after receiving dual treatment suggesting that both infants and parents may benefit from dual music therapy and kangaroo care as opposed to kangaroo care alone.

Length of Stay for Premature Infants

In a study examining the use of one technique of music therapy with premature infants, developmental multimodal stimulation, Walworth et al. (2012) found that babies who

received developmental multimodal stimulation had, on average, a shortened stay of 12.9 days in the hospital. The researchers examined how the differences between gender and singing paired with guitar or singing without guitar affected the length of stay for 108 premature infants and found that males showed the most decrease in length of stay when paired with singing, leaving the hospital 15.7 days sooner on average than any other group. Females showed the greatest decrease in length of stay when they received singing paired with guitar accompaniment, averaging a decreased length of stay by 12 days. The authors concluded that developmental multimodal stimulation seems to benefit neurodevelopment for premature infants in the NICU.

Through a posthoc analysis of a NICU music therapy program, Standley and Swedberg (2011) found that infants who received music therapy services gained more weight per day than those who did not, resulting in a faster discharge. The authors reviewed charts of infants who received music therapy and those who did not. Standley and Swedberg found that music therapy primarily received referrals for low birthweight infants and infants with complex medical issues. Additionally, they found that infants between 24 and 28 weeks corrected gestational age who received music therapy had shortened length of stay and gained more weight per day than those in the same age range who did not received music therapy. Additionally, the authors found that infants born after 30 weeks gestational age who received music therapy had a longer stay than those who did not, presumably due to the severity of their medical needs.

Parental Engagement

Parental involvement and interactions with infants have been shown to shorten length of stay for premature infants and infants diagnosed with NAS (Gooding, 2010; Howard et al.,

2017; Teckenberg-Jansson et al., 2011). Whipple (2000) examined the effects of parental training in music and multi-modal developmental stimulation on infant-parent interactions. She found that parents who received a 1-hour long training in multi-modal developmental stimulation with their infants reported spending significantly more time at the hospital than those who did not. Additionally, signs of infant stress and parent actions were observed in an effort to measure quality of interactions. Parents who received the training showed more appropriate interactions and their infants showed fewer signs of stress than those who had not received the training. Although not significant, length of stay was shorter and weight gained per day was greater for infants whose parents received training, as well.

Music Therapy for Patients with Neonatal Abstinence Syndrome

To date, only two studies have been completed examining the use of music therapy for patients with NAS (Calabro & Grocke, 2017; Detmer, DeLoach, Forbes, & Gossom, 2017). In the first study of its kind, Calabro and Grocke examined two different interventions involving music for infants diagnosed with NAS. Each of their 25 participants were assigned to one of four groups: (a) control group, (b) recorded sedative music group, (c) multimodal stimulation group, and (d) both recorded sedative music and multimodal stimulation group. The outcome data were length of stay, weight gain per day, frequency of parental visits, and the need for medication. The outcome of their study showed no statistically significant differences among the groups. The authors believe the small sample size was largely responsible for this. Additionally, two patients in Group (d) experienced significantly longer hospitalizations than typical, which the authors believed skewed the data, as well.

Calabro and Grocke (2017) recommended more emphasis be put on the parental training of these two interventions in the future; however, the practicality of this may be

difficult to implement, as the availability of music therapists and the frequency of parental visits may not align. As previously mentioned, the social issues surrounding NAS patients are often complex. Calabro and Grocke emphasized that when parents were present at the bedside, they frequently discussed wanting to do their best to provide a loving and caring home for their child; however, the parental presence at bedside is often less frequent for infants diagnosed with NAS as compared to other diagnoses. One of the primary outcomes of this study as indicated by the authors, was the attitude of the medical staff, as well as parents, towards the researchers during the study. They found the staff welcomed the interventions, as nurses often find NAS patients to be challenging to treat, and the clinical team in this hospital was aware of the positive impacts of nonpharmacological interventions for NAS patients. Music interventions gave parents a way of bonding with their children that helped them feel they could provide a positive environment for the infants to make progress.

The second study involving music therapy and NAS patients was a quality improvement project conducted by Detmer et al. (2017). The study included a control group ($n = 9$) that received standard care and an experimental group ($n = 11$) which received a music therapy session 3–4 times a week using the PAL®. The researchers collected data using the three Finnegan scores for the patient prior to and the three Finnegan scores after sessions as a measurement tool. The authors found that the mean Finnegan score of the experimental group was lowered after receiving the music therapy intervention, whereas the mean Finnegan score of the control group after receiving standard care increased. The authors concluded that infants who received the PAL® intervention had better outcomes than those who received only standard care.

Perspective of the Researcher

I came to this topic of study through my internship at a children's hospital. I was curious how music therapy shortened length of stay for infants in the NICU and originally started my questionings in the direction of completing a quantitative study focusing on length of stay in the NICU. Through conversations with my internship supervisor, I discovered a fairly new population of infants in the hospital with whom music therapists had begun working; infants diagnosed with neonatal abstinence syndrome. My first experience working with an infant was what my supervisor called a "rough case." The infant had particularly high Finnegan scores and was very hard to calm. Incidentally, my first experience working with an infant with NAS was also the one case I witnessed where the mother was very present at the bedside. I have now come to learn that this is unusual, as consistent parental presence at the bedside for infants with NAS is uncommon.

As I began to learn more about the diagnosis of NAS, I became convinced that this particular population was one I wanted to work with on a deeper level. The more questions I asked my supervisor and the more I read the available literature, the more I realized there were still so many unknowns for the treatment of infants with NAS, not only pharmacologically, but with nonpharmacological interventions such as music therapy. In discussions with other music therapists and review of the available literature, I realized the field of music therapy was still trying to determine the best interventions with these infants to help lessen the impact of their hospital stay on their lives and the lives of their caregivers. I also realized I wanted to ask more questions to continue the conversation. This led me to ask

the question: What is currently happening in routine practice with music therapists who work with infants with NAS?

One attitude I hold is that without quantitative research supporting the use of one intervention over the other, I do not feel as though anyone has authority to generalize their findings/ways of working to others in the field. As this is an emerging population for music therapy, I recognize that music therapists will use research and best practices for populations as closely aligned with this population as possible to move forward in their clinical practice. I also recognize that this is a valuable and necessary way of working until further research can be conducted. This attitude is one that is being challenged as I conduct a study to describe what is currently happening in the field.

My experience working with patients with NAS was limited to two interventions. One was using the Pacifier Activated Lullaby and one was using a sequence that begins with a high level of stimulation (to match the infant's heightened state) and gradually removes stimuli to help the infant transition to a calm state. The second intervention is referred to as iso principle and containment hold. These interventions were intermittently successful and my supervisor and I would often say to each other, "There has to be a better way. What are we missing?" We found a lack of research in this area to be frustrating both to her as a clinician attempting to train me, and to me as an intern attempting to learn best practices. The desire to understand how music therapy can benefit infants with NAS and their caregivers led me to this study.

Chapter 3

Method

This chapter will describe the method used in the research. This will include the research design, informants, procedure, and data analysis.

Research Design

The research design for this study was a qualitative content analysis. It was the intent of the researcher to describe how music therapists provide care for patients with NAS and their caregivers by asking open-ended questions that allowed the informants to share their experience and then review and analyze the interview transcripts to find repeated and significant themes. An interview guide was created (see Appendix A) and used to provide a semi-structured interview format. The interview questions were created by the researcher and based on previously published literature on the topic (Calabro & Grocke, 2017; Detmer et al., 2017), as well as the questions that arose during her own practice in the NICU. The study was reviewed and declared exempt by the Appalachian State University Institutional Review Board (IRB# 19-0010).

Informants

A small group of music therapists who worked with infants in NICUs were contacted via email and were asked if they were willing to participate in an interview using the videoconferencing software Zoom. These music therapists were found by implementing the use of snowball sampling that began with the chairperson of this thesis. The researcher chose four respondents to complete the interview based on speed of their response to the email.

Only four respondents were interviewed due to time restrictions to complete the research. The informants were emailed a consent form (see Appendix B), which they signed and returned to the researcher. None of the four informants were working directly with infants with NAS and their caregivers at the time of the interviews. They each described and referred to their experience that included working with infants with NAS and their caregivers that had occurred in the years prior to the interviews. The researcher gave pseudonyms to the informants who requested to remain anonymous after transcriptions of the interviews were completed.

Procedure

Once informants were selected, interviews were scheduled and conducted via Zoom, a videoconferencing software that recorded and transcribed the calls. The researcher used an interview guide (see Appendix A) to provide a semi-structured interview format so that informants had the opportunity to discuss their experience providing treatment for infants diagnosed with NAS and their caregivers. Each informant received a copy of the transcription of their interview and was provided the opportunity to make any corrections or edits in order to increase validity of results.

Data Gathering and Analysis

The researcher based her qualitative analysis on a method outlined by Creswell (2013). This method included the following steps:

1. Horizontalization: Transcribed interviews were reviewed, and relevant statements made by the informants were extracted.
2. Clusters of meaning (themes): The key statements made by the informants were organized according to topic and the researcher distilled one to two sentences

from each grouping that described the essence of what the informants said. These clusters of meanings, or themes, were grouped under the heading of the subquestions to help organize the information.

3. Textural description: Once the topics of meaning had been named, the researcher combined the topics to write an overall description of how music therapists provide care for infants with NAS and their caregivers.
4. Summary of results: Using the textural description, the researcher summarized the results into a one-paragraph description of what it is like to provide music therapy for infants with NAS and their caregivers into one paragraph.

Chapter 4

Results

This chapter details the findings of the interviews. Each meaning cluster is written as a heading and discussed using key statements made by the informants to provide context. The informants chose whether or not they would like to be identified or remain anonymous. For those who wished to remain anonymous, a pseudonym was created. The informants' names are Mary, Jessica, Daniel, and Joanne. All informants were board-certified music therapists, all had a minimum of a master's degree in music therapy and two had doctorates. The summary of results is included at the end of the chapter.

Training

While music therapists have received training to work with premature infants, they have no specific training to work with infants with NAS. All the informants stated at some point in the interview that they had to seek out education from colleagues in other disciplines who had worked with this population to further their knowledge. They all used music therapy research with premature infants as a starting point and then adjusted their treatment based on the responses they were seeing from the infant. Mary said, "The rest of [my training] I've mostly gotten through reading research about it, as well as watching documentaries on it So again, they're not music therapy specific trainings, but they are specific to treating these infants as a neonatal therapist." It was intriguing for the researcher to observe how the informants who had been in the field of music therapy for a longer amount of time discussed the lack of research availability and training as an obvious statement rather than with the

indignation and frustration felt from the music therapists who were younger and had less experience with lack of available music therapy research.

Needs Vary

Needs of the infant and their caregiver often vary and need continual assessment. The primary reasons for referral to music therapy of the infants with NAS were to assist with poor sleep, poor feeding, inability of the infant to self-soothe, and family support; however, each of these needs involved nuanced causes (aside from diagnosis of NAS) such as the environment or their pharmacological wean schedule and, at times, infants had comorbidities that made assessment and treatment planning more complicated. Mary describes the treatment of infants with comorbidities by saying,

Because we're a non-birthing hospital [the infants] usually came to us if they had an additional need on top of just neonatal abstinence syndrome being their diagnosis. So because of that, it's tricky. You know, we're having to juggle some other things going on with the infant and NAS might not even be the primary thing that they need treatment for.

Daniel emphasized the importance of assessing the needs for each individual infant by saying, "I would never put them on a certain schedule, just because they're NAS, I would put them on a schedule based on the most critical need."

Assessment

Observation, assessment, and continuous responsiveness to the infant is of primary and utmost importance. This theme of observation, assessment, and flexibility was one of the strongest and most repeated amongst the informants. It encompassed flexibility from the

music therapist based on observation and assessment of the hospital unit, the environment in which the infant was placed, the family, and the infant. Mary said,

This population takes a lot of clinical judgment on the clinician's part. You really have to know not only your intervention, but you have to know your client and the symptoms they're dealing with and really use that clinical judgment on how to use that intervention to best fit your client.

Daniel made a statement similar to Mary's, stating,

We do that [referring to assessment] in our field. We do that with every other population. When we go work with an adult in the hospital and we haven't interacted with them before, we talk with them, we assess and we get feedback from them and then we change courses multiple times throughout the session.

Educating plays a role

Music therapists educate staff and caregivers on how music therapy can benefit infants with NAS. There was variance in the approach that the informants took in educating staff and caregivers. Some informants would teach staff and parents music therapy techniques, such as Daniel who said, "The iso principle intervention is something we teach the parents as well. And the other NICU staff." Joanne stated,

We want to empower parents and we want to teach the staff so they give us referrals. At the same time, we want to in-service and explain the discipline of music therapy. That doesn't mean we give it away and tell them to do it. . . . We don't train nurses or doctors to do music therapy.

A Primary Nonpharmacological Intervention

Music therapy is the primary nonpharmacological intervention that hospitals are using in various ways to treat infants with NAS. Mary, Jessica, and Daniel stated that music therapy was either an automatic consult or was one of the first nonpharmacological interventions consulted when an infant with NAS arrived in the NICU. Each hospital varied in its use of cotreatment among disciplines and other nonpharmacological interventions used. Many other nonpharmacological interventions were mentioned by the informants such occupational therapy, speech therapy, jin shin jytsu, volunteer “rockers” or “cuddlers” who hold the infants, the use of lavender, and the use of swings/rockers. The wide range of nonpharmacological interventions being trialed and tested by hospitals indicate that the medical community sees the need for alternative therapies to help infants with NAS. It also may indicate that research studies of music therapy with this population would be accepted well by staff and caregivers alike.

A Welcomed Nonpharmacological Approach

Music therapy for infants with NAS is viewed as a necessity and a welcomed intervention by doctors and nurses. Daniel discussed how staff were receptive to music therapy saying, “I would say, in general, the perspective or attitude toward music therapy is positive. There is just some uncertainty about what we actually do. But it's never been about, in my experience, whether or not we should be there.” Making a statement similar to Daniel's, Mary said, “[The staff was] one hundred percent on board. I think we're the first thing that's consulted besides the pharmacist getting involved. We're number two. So, they're very fast to get us involved.”

Interventions

Interventions used for infants and their caregiver depend on the need and state of the infant and caregiver. Many interventions were discussed by the informants and the researcher attempted to sort them into the following subcategories of meaning.

1. **Interventions for infants.** Interventions for infants varied based on where the infant was in their wean and the goal the intervention was attempting to reach, as well as the current mood state of the infant. Interventions for infants with a high energy level (i.e., angry, agitated, unable to calm) included the use of the iso principle with containment hold and the shaker egg. For infants who were already calm, live contingent singing and multimodal neurologic enhancement techniques were used. Interventions, the use of which remained unspecified by the informants, included the PAL[®], tonal vocal holding, the ocean disc, the gato box, live contingent singing, and a song of kin (lullaby), and iso principle with containment hold. Additionally, the PAL[®] was reported to be used at different times for different purposes. Daniel said, “The PAL[®] can be used in two different approaches. One is to improve feeding or the organization and coordination before feeding. The second is to promote calming and sleep.” Mary stated, “The PAL[®] was used up to twice a day . . . around feeding time and around a medication dosing need.”
2. **Interventions for caregivers.** The interventions the informants used with and for caregivers included support for the self and support for the self-as-a-caregiver through relaxation, education, live singing, and verbal processing. Daniel described it this way:

Maybe the mom is actually in active withdrawal and is really anxious and doesn't feel like a good caregiver. She feels stigmatized or shunned with having her baby in the NICU, and she doesn't feel included or welcome in the environment . . . I might just work one-on-one with a mom and do some relaxation, or just some cognitive processing. Both parents need a lot of empowerment and encouragement and then education on some simple strategies to use with their infant.

Joanne described different interventions used with mothers, saying,

If a mom is very tense, and it's her first baby, and she doesn't realize how her tension is getting translated into her breast, she's holding on. So, her heartbeat is either too fast or too slow because she has trauma. We might use a lullaby, a song of kin, and ask her to sing her song of kin slowly, supported by a music therapist, so that her chest warms, her breath slows, and her milk will come in easier.

Hospital Variances

Timing and dosage of music therapy treatment for infants with NAS varies from hospital to hospital. Most of the informants worked in an on-call type of setting where nurses would call when the infant was upset and/or around the time of feeding or administration of medication, however, the pharmacological regimen and wean time varied from hospital to hospital. Therefore, music therapy treatment looked different for each of the informants.

Jessica said, “We usually don't work with [infants with NAS] until they're captured with their medication dosage that they're working on.” Conversely, Daniel stated,

What I've learned in the past couple years is if we can really be present during those first three days of the NICU admission, we get to know the baby really well, we get to

know the family well, and we can be there when the babies are having the most difficult time. It seems to work much better if can teach them early on.

Anecdotal Benefits

The benefits observed by the music therapist, staff, and caregivers are anecdotal and address the infant's primary functions of eating, sleeping, and soothing. Each of the informants were quick to state that all observations were anecdotal and that no valid and reliable studies had been conducted on a large enough scale to substantiate the results; however, the benefits discussed by the informants included improvements in sleep (easier transition and longer duration), better feeding (steadier, less frenzied suck, fewer GI symptoms), improved mood state while awake (more relaxed and calmer affect), and less need for pharmacological intervention.

Caregiver Support

Music therapy is impactful for parents, specifically mothers, and music therapists need to provide support prior to birth. Mary stated, "I think it's so important to see what's happening with moms in NICUs. I think we need to be there for them during this process because they need somebody, and I think we are one of the most beneficial nonpharmacological interventions they can use." Later on, in referencing mothers' entering into methadone treatment programs, she said,

I think what we're about to see now, which will be interesting, is to look at, not the drug that the mom was on, although I do think that's important, it's when in the pregnancy she got into the treatment program. Because I think that is going to make a huge difference [for the infant].

Early Childhood

A continuation of research with this population will need to include music therapy in early childhood development. This theme was discussed in reference to the long-term impact that medication could have on infants with NAS. Mary said, "So I think the next question is, now what do we do when they get home? Because hospitals are getting really good at getting them out the door fast, so we're not going to get see them very long. So, what are the music therapists in early childhood going to do for these kiddos? They're up next!"

More Research Is Needed

All informants recognized and emphasized the need for more research among the music therapy community with this population. Daniel said, "We need more data not only back up [what we do], but also to demonstrate what we should be doing." Two of the four informants were actively involved in research and all four had research ideas to extend the knowledge-base for music therapists working with infants with NAS and their caregivers.

Consensus Needed

While each hospital's treatment regimen is different and each infant is different, consensus on treatment is needed in the medical community. The differences among how patients were treated encompassed the timing and speed of the pharmacological wean, the nonpharmacological interventions used aside from music therapy, and the environment in which the patients were placed. Mary said,

I would love to see a consensus from the medical community that allows us to do more pointed, specific research that allows us to tap in to some of these minor differences that might make a world of a difference for what we're doing with the infant with NAS.

Thoughtfulness in Practice and Research

How music therapists speak about their work and their clients is important. Music therapists must ask questions respectfully before presuming the answers. This meaning unit found similar themes and connections to the idea of assessment and observation. Daniel said,

At this point, we're so premature to really be doing huge studies with this population because we still don't know what we should be studying. So, I think this type of research work is important because we have to do our due diligence and learn what is out there that people are doing naturally and instinctively. Then we can build that into our protocol and study that. We don't want to just go out and like try this random intervention that we just dreamed up one night, right?

Joanne considered the importance of how music therapists discuss their work saying, "We have to get better at language in music therapy and naming what we do accurately.

Additionally, one of the things that's come up most for me with this population is describing the babies as addicted. I made that mistake...They're born dependent, not addicted." She went on to state,

So that is sort of my thought is to leave this interview and this study of all human beings, no matter what their illness is with respect, and naming what a disease is or a music therapy term beckoning through research is, accurately, intelligently, artistically, and most of all, respectfully.

Summary of Results

Music therapy for infants with NAS and their caregivers is continual education, discovery, and re-discovery. It is welcomed and often misunderstood by those who are not music therapists. Practicing with this population requires much experimentation and the need

for clinical instincts and reflexivity. Observation and continual assessment of the infant, caregiver, environment, and staff are imperative. Music therapists see the difference they make and are working to conduct the research necessary to extend the availability of music therapy, as well as determine best practices. Music therapy shares a need to understand and provide support for this population with the medical community, as it, like music therapy, is still attempting to find the best solutions for treatment. There are still many questions.

Chapter 5

Discussion

The purpose of this study was to describe how music therapists provide care for patients with NAS and their caregivers. Prior, stable relationships with NICU staff provided music therapists the opportunity to assess, observe, and respond flexibly to staff, patient and caregiver needs. The approaches towards co-treatment with other disciplines and the music therapy interventions used by each informant varied by hospital. Some of the challenges faced by music therapists working with this population are lack of research, the unique needs of each patient, and the lack of consensus among the medical community in regard to pharmacological treatment of infants with NAS. The researcher extracted and analyzed 14 clusters of meaning (themes), leading to a final summary of results to describe what it is like for music therapists to provide care for patients with NAS and their caregivers. This chapter will compare similarities and differences of the findings of the present study to previously published literature, as well as discuss implications for future research and limitations of this study. The research questions posed by the researcher will serve as categories to organize the discussion.

How Do Music Therapists Support Caregivers of Infants with NAS?

A recurring theme throughout the interviews among all informants was the importance of observing, listening, educating, and collaborating with staff, with families, and with infants. The importance of this finding is common to most writings on the practice of music therapy (Gfeller, 2008). The field of music therapy relies on the assessment and

responsive abilities of music therapists to see and respond to the needs of their clients. While little literature is available concerning specific techniques to use with infants diagnosed with NAS, it is interesting that music therapists are being called upon to address this population, which requires such a high need for assessment and flexibility in the moment.

For an infant with NAS, the environment makes an impact on their overall well-being. Similar to previous findings regarding infants in the NICU, the informants of this study discussed how the impact of the environment could be detrimental for infants diagnosed with NAS. However, in addition to recognizing that it could be detrimental, informants in this study discussed how they were actively educating staff and caregivers on the impact of the environment and how they had seen success by assessing and then adjusting the environment appropriately for the infant (Balakrishnan & Suresh, 2018; Grossborn et al., 2017; Grossman et al., 2017; Howard et al., 2017).

Similar to the findings of Grossman et al. (2017), this study found that nonpharmacological interventions are finding their place in NICU environments. The wide range of nonpharmacological interventions mentioned by informants demonstrate the openness of hospitals to trying new approaches and seeking alternative therapies for infants diagnosed with NAS. Unlike the findings of Grossman et al., this study found that music therapy was the primary nonpharmacological intervention consulted. This could be due to the fact that all the informants worked at hospitals with thriving NICU music therapy programs, whereas, music therapy is a nonpharmacological intervention to which not all hospitals have access or funding to support.

What Interventions Do Music Therapists Use to Treat Infants with NAS?

A total of 13 different music therapy interventions were discussed by the informants, nine used for the infant and four used with the caregiver of the infant. The PAL® and multi-modal stimulation were the only two interventions mentioned by three out of the four informants that was also discussed in the literature review. The assumption of the researcher is that this is primarily due to a lack of literature available with this population, which has led music therapists to begin educating themselves and then developing new ways of working with the infants. The four interventions discussed to be used with caregivers (verbal processing, relaxation, education, and live singing) were similar to interventions used by music therapists working in NICUs as seen in the literature (Gooding, 2010; Howard et al., 2017; Teckenberg-Jansson et al., 2011; Whipple, 2000). Two informants, Daniel and Joanne, both mentioned the concern for mothers of infants diagnosed with NAS feeling shunned or ostracized by hospital staff due to perceived judgement or the parent's guilt. This should be taken into consideration when music therapists consider their treatment approach for infants with NAS and their caregivers.

How Does Music Therapy Treatment Benefit Patients with NAS?

Similar to the findings of Detmer et al. (2017), the informants of the current study discussed many ways in which they had observed better outcomes for infants diagnosed with NAS who received music therapy treatment. The benefits discussed by the informants included improvements in sleep (easier transition and longer duration), better feeding (steadier, less frenzied suck, fewer GI symptoms), improved mood state while awake (more relaxed and calmer affect), and decreased need for pharmacological intervention. It is again important to note that all the results seen by the informants were anecdotal.

What Challenges Do Music Therapists Face in Treating Infants with NAS?

The two primary challenges discussed by the informants were not challenges discussed in the literature. The first challenge was the lack of research conducted and training available for music therapists working with infants with NAS and their caregivers. The second was the lack of consensus among the medical community regarding best practices for treating infants with NAS pharmacologically and nonpharmacologically. The differing wean schedules, initial dosages given, and medication prescribed makes it challenging for music therapists to conduct large-scale, multisite studies with this population, adding to the dilemma of not knowing which interventions are supported by quantitative research.

How Might Music Therapy for Infants with NAS Manifest in the Future?

The focus of the discussion when the informants were questioned about the future of music therapy work with infants with NAS and their caregivers primarily involved ideas for research. Aside from interventions being quantitatively studied two areas that were suggested to receive specific focus were providing services and support to mothers prior to the birth of their infant when they are in treatment and providing services for the infants in their early childhood after they leave the hospital. There is much to be learned in this area, specifically how the cultural attitudes and messaging impact a mother's decision to enter treatment after learning she is pregnant. This is an area that has macro-level implications on the systems, services, and resources available to women who are addicted and become pregnant.

The final theme that helps answer the question of how music therapy might manifest for this population in the future is the importance of the language we use and the questions we ask in exploring the subject matter. The informants expressed their care and concern for using language that offers dignity and respect to the infants and their caregivers, as well as

accuracy in describing music therapy. Among all the themes, this theme is one that most impacted the researcher. Respect, dignity, and care for the clients with which music therapists work must remain as the primary concern as the field of music therapy attempts to understand what is needed, create interventions, and provide care for infants with NAS and their caregivers.

Limitations

One limitation of this study was the small sample size. Interviewing four informants limited the reliability of the data findings to the experience of only four music therapists. While there were similarities among the four, the variability and differences indicated the need for a larger sample size to get an accurate picture of the state of music therapy with infants diagnosed with NAS and their caregivers. Another limitation was the use of snowball sampling. The recruitment method resulted in three of the four informants having received very similar training, which led to similar ways of thinking about and practicing music therapy in a NICU setting. Additionally, while all of the informants had experience working in the NICU within the last several years, none were working with infants with NAS directly at the time of the interviews, but rather in the roles of researchers and educators. Finally, the researcher was limited by her own experiences and bias in interpreting and formatting the data, as is intrinsic to any research, but specifically to the content analysis method employed in this study.

Implications for Future Research

There are many implications for future research within this study. Recommendations from the informants themselves included researching the following topics: How does the timing of a mother's entering a methadone treatment program impact the infant? What is the

impact of the diagnosis of NAS on early childhood development? And finally, what is the best dosage and time to start music therapy treatment for infants diagnosed with NAS? While this study attempted to discover what interventions music therapists are currently using with infants diagnosed with NAS and their caregivers, additional large, multi-site, randomized-control trials are needed to further determine the best interventions to use. As stated by one of the informants, this will be challenging, if not impossible to conduct, until the medical community determines best pharmacological practices for infants with NAS. In the meantime, it may be helpful for music therapists and researchers to continue asking questions that provide helpful foundational knowledge through qualitative studies to direct future RCT studies.

Summary and Conclusion

This study sought to describe how music therapists provide care for patients with NAS and their caregivers. The researcher interviewed four music therapists experienced in working with infants diagnosed with NAS and their caregivers. The results of the study showed that music therapists provide care for patients diagnosed with NAS and their caregivers by observing, assessing, and responding flexibly to their needs in the moment. They establish stable, working relationships with NICU staff in an effort to provide the best care possible for patients diagnosed with NAS and their caregivers. Music therapists provide a variety of interventions based on the needs and state of the infant and caregiver which, anecdotally, results in infants who sleep, eat, and soothe better, as well as caregivers who feel respected, encouraged, and empowered to care for their infant. Further research is needed to determine best practices for music therapists working with infants with NAS and their caregivers, but the informants of this study have provided insight into the experience of four

music therapists who are working to change the world for infants diagnosed with NAS and their caregivers. In conclusion, Joanne stated,

To be able to work with trauma, which exists extensively in NAS families, and to be able to form the symphony between the unit and the families and within the body of an infant with NAS, has been a great treasure. There are great resources for safety, beauty, and culture in this world of NICU music therapy and in this treatment of NAS families and babies.

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Appendix A

Consent Form

Music Therapy for Infants with Neonatal Abstinence Syndrome: A Phenomenological Study

Principal Investigator: Miriam Tart, MT-BC

Department: Music Therapy

Contact Information: Miriam Tart, 509.481.5222, stappmf@appstate.edu

Faculty Adviser: Dr. Cathy McKinney, 828.262.6444, mckinneych@appstate.edu

You are invited to participate in a research study about music therapy for infants with neonatal abstinence syndrome.

If you agree to be part of the research study, you will be asked to complete an interview via videoconference in which you discuss your experience working with infants diagnosed with neonatal abstinence syndrome and their caregivers.

Consent to Participate in Research ***Information to Consider About this Research***

I agree to participate as an interviewee in this research project, which concerns the work of music therapists with infants diagnosed with neonatal abstinence syndrome. The interview(s) will take place via a videoconference. I understand the interview will be about your experience working with infants with neonatal abstinence syndrome and their caregivers.

I understand that there are no foreseeable risks associated with my participation.

I understand that the interview will be recorded. I understand that the recordings of my interview will be transcribed and stored on her personal laptop if I sign the authorization below.

I give Miriam Tart ownership of the transcripts and recordings from the interview(s) she conducts with me and understand that recordings and transcripts will be kept in her possession. I understand that information or quotations from the recorded interview will be used in a thesis in partial fulfillment of a master's degree. I understand I will not receive compensation for the interview.

I understand that the interview is voluntary and there are no consequences if I choose not to participate. I also understand that I do not have to answer any questions and can end the interview at any time with no consequences.

If I have questions about this research project, I can call Miriam Tart at 509-481-5222 or the Appalachian Institutional Review Board Administrator at 828-262-2692(days), through email

at irb@appstate.edu or at Appalachian State University, Office of Research Protections, IRB Administrator, Boone, NC 28608.

This research project has been approved on 8/26/19 by the Institutional Review Board (IRB) at Appalachian State University. This approval will expire on 8/25/2020 unless the IRB renews the approval of this research.

I request that my name **not** be used in connection with tapes, transcripts, photographs or publications resulting from this interview.

I request that my name **be used** in connection with tapes, transcripts, photographs or publications resulting from this interview.

By signing this form, I acknowledge that I have read this form, had the opportunity to ask questions about the research and received satisfactory answers, and want to participate. I understand I can keep a copy for my records.

Participant's Name (PRINT)
Date

Signature

Appendix B

Interview Questions

Describe your credentials.

Describe the training you received to work with infants with NAS.

Approximately how many infants with NAS do you treat in a month?

Describe the typical music therapy treatment schedule for patients diagnosed with NAS.

Describe the intervention(s) you use in the treatment of infants with NAS.

What are typical outcomes of music therapy interventions?

Describe how you assess the results of the music therapy intervention for infants with NAS.

Describe non-pharmacological treatments infants with NAS receive at your hospital.

What is the role of music therapy in co-treatment?

Do you train nurses and/or caregivers to use music with the infants with NAS?

Describe your impression of the attitude of your NICU team towards music therapy for infants with NAS.

Describe your vision for music therapy for infants with NAS in the future. What kind of interventions, training, and/or research would you like to see develop with this population?

Vita

Miriam Tart was born in Eastland, TX, to David and Tana Stapp. She was home schooled for the duration of her elementary and high school years beginning in Texas and moving to Washington State to graduate high school in 2008. She attended and graduated from Corban University in Salem, OR, with a Bachelor of Science in music performance in 2012 and immediately moved to Charlotte, NC. She returned to school in 2016 to complete the combined Equivalency/Master of Music Therapy program at Appalachian State University. She completed her internship at Levine Children's Hospital in Charlotte, NC, and became a board-certified music therapist in 2019. Miriam practices music therapy in a private practice music therapy clinic. She resides in Charlotte, NC, with her husband.