

Liberty University

School of Music

**A Holistic Approach to Music for
Stress Management During Pregnancy**

A Dissertation Submitted to
the Faculty of the School of Music
in Candidacy for the Degree of
Ph.D. in Music Education

by

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Abstract

Pregnancy is a transformative journey for women, but amidst the excitement and anticipation that most women experience, pregnancy often raises stress levels to profound heights for various reasons, which may include hormonal fluctuations, physical discomforts, concerns about the baby's health, financial pressures, relationship changes, fear of labor and birth, life adjustments, and societal expectations. The purpose of this qualitative hermeneutic phenomenological study was to examine how music interventions impacted stress levels during pregnancy. This two-week study employed an in-person group experiment involving pregnant women. The study sample was selected via voluntary response sampling, where pregnant women volunteered to participate in the program study. Study participants took part in an evidence-based two-week stress management music class. Before beginning the class, participants responded to a qualitative entrance questionnaire so that the researcher could obtain baseline stress levels for each woman. During the two-week music class, women learned stress-reducing musical techniques and were given a music protocol to use daily at home. After the completion of the two-week session, participants completed a qualitative exit questionnaire to re-evaluate their stress levels following the two-week music session. Existing literature in this area of study guided the development of the entrance and exit questionnaires, as well as the development of activities, exercises, and music used in the eight-week music classes. The data collected from entrance and exit interviews were categorized and organized by keywords to show the most common responses among the participants. The data from the above procedures were analyzed to determine how music can be effective for stress management during pregnancy.

Keywords: stress management, pregnancy, prenatal, music, holistic, alternative.

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Dedication

I would like to begin by thanking my chair, Dr. Karen Kuehmann, for your unwavering support, guidance, and encouragement throughout this journey. I am deeply grateful for your expertise, mentorship, and all the time you invested in helping me achieve this goal. Thank you for your constant prayers and support; I am so very thankful for all you have done. This entire process was so enjoyable because of who you are – your passion for music and education is evident in all you do!

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To my sweet baby boy, Lennon Daniel Davis–this is all for you, my love. I began this research journey on music during pregnancy long before God gave you to me. I was passionate about this topic before I became your mama, but my passion for this area of research grew as you grew in my tummy and as my love for you did, too. I am so glad you spent ten wonderful months with me as I brought this study to life. You were there listening to all the songs I sang, you experienced the power of music in my womb, and I know that you are with Jesus now, singing away. I can only just imagine the beauty of the music in heaven! My Lennon love, there is not a second that goes by that I do not miss you and ache for you to be in my arms–three days was just not enough time. But I am thankful that God allowed me to experience this study coming to life with you, throughout my pregnancy. I always thought that receiving my Ph.D. would be my biggest accomplishment, but nothing I ever do in this life will compare to being your mama.

It has only been four months since Lennon went home to be with Jesus, and I would remiss if I did not acknowledge my inability to finish this study without God’s strength. I pray that He will use my story for His glory and that through Him, the power of music will change lives. I leave you now with this promise and pray it will sustain you in the same way it has sustained me: “I have said these things to you, that in me you may have peace. In the world you will have tribulation. But take heart; I have overcome the world (John 16:33, ESV).

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Abbreviations

CDC: Centers for Disease Control

EPDS: Edinburgh Postnatal Depression Scale

HPA: Hypothalamic Pituitary Adrenal

HRV: Heart Rate Variability

N-PASS: Neonatal Pain, Agitation, and Sedation Scale

NST: Non-Stress Test

PPD: Postpartum Depression

PSS: Perceived Stress Scale

S-STAI: Scale State-Trait Anxiety Inventory

TFA: Theoretical Framework of Acceptability

VAS: Visual Analogue Scale

WHO: World Health Organization

Chapter 1: Introduction

Overview

The purpose of this qualitative hermeneutic phenomenological study was to examine how music interventions influence stress levels during pregnancy and how musical interventions can be implemented to positively affect pregnancy experiences. Chapter One provides a historical, sociological, and theoretical background of the problem, which then informs the purpose and significance of the study. Next, central and sub-research questions are stated, which align with the problem, purpose, and significance of the study. Finally, Chapter One concludes with a list of definitions and a summary.

Background

Stress, which is defined as “a psychological state in which one experiences harm, a threat, or a challenge to their current resources and capacity,” affects everyone but is especially concerning for women who are currently pregnant.¹ While the body’s response to stress is a necessary and natural reaction to a disturbed equilibrium, modern stressors, such as work pressure, examinations, trauma, physical stress, medical disorders, and financial troubles, can be detrimental to women’s health and negatively impact their pregnancy journeys. Suggested treatments for stress management during pregnancy may range from yoga to mindfulness and laughing with friends to treating oneself, and even medicine, but there is not a clear proposed plan of treatment that encompasses the entire pregnancy period. During pregnancy,

¹ Lu Li, Yuanyuan Liu, and Yuanyuan Jamie Li, “Frozen by Stress: Stress Increases Scope Insensitivity,” ed. Kimmo Eriksson, *PLOS ONE* 14, no. 10 (October 4, 2019): e0223489, <https://doi.org/10.1371/journal.pone.0223489>.

pharmacological stress management may not be an acceptable approach “due to concerns about the potential teratogenic effects of some commonly used pharmaceuticals, such as barbiturates, opioids, benzodiazepines, thalidomide, and paroxetine.”² For many women, counseling and therapy may be an appropriate form of stress management, but for women who experience toxic stress, a prolonged exposure to physical, emotional, or environmental stressors that lead to alterations in biochemistry, counseling and therapy are not often effective.³ Alternatively, various music interventions have been shown to successfully reduce cortisol levels (the stress hormone), resulting in superior pregnancy outcomes. As a non-invasive, cost-effective, and widely accessible treatment, this study explores how music can be used as an alternative and holistic approach to managing stress throughout pregnancy.

While often referred to as a psychological state, the body’s response to a stressor begins as a hormonal response. “Reactions to stress are associated with enhanced secretion of a number of hormones including glucocorticoids, catecholamines, growth hormone and prolactin, the effect of which is to increase mobilization of energy sources and adapt the individual to its new circumstance.”⁴ When the body’s hormonal levels are imbalanced, especially during times of chronic stress, the immune system becomes suppressed, which “in turn, raises the risk of viral infection.”⁵ During pregnancy, viral infections can be particularly harmful and are “are major

² Pao-Ju Chen et al., “Effects of Prenatal Yoga on Women’s Stress and Immune Function across Pregnancy: A Randomized Controlled Trial,” *Complementary Therapies in Medicine* 31 (April 2017): 109–17, <https://doi.org/10.1016/j.ctim.2017.03.003>.

³ Paris Ekeke et al., “Racial Differences in the Biochemical Effects of Stress in Pregnancy,” *International Journal of Environmental Research and Public Health* 17, no. 19 (October 1, 2020): 6941, <https://doi.org/10.3390/ijerph17196941>.

⁴ Salam Ranabir and K Reetu, “Stress and Hormones,” *Indian Journal of Endocrinology and Metabolism* 15, no. 1 (2011): 18, <https://doi.org/10.4103/2230-8210.77573>.

⁵ Mohd Razali Salleh, “Life Event, Stress and Illness,” *The Malaysian Journal of Medical Sciences : MJMS* 15, no. 4 (October 15, 2008): 9–18, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3341916/>.

causes of maternal and fetal morbidity and mortality.”⁶ Additionally, maternal stress during pregnancy negatively influences “mother-child interactions, including bonding, breastfeeding, and the maternal role” during the postpartum period and beyond.⁷

The risks of undiagnosed and untreated stress, anxiety, and depression during pregnancy include physical, social, intellectual, emotional, spiritual, and cognitive concerns that transcend generations. While stress is not considered a transmissible disease, the World Health Organization (WHO) has dubbed stress as “the health epidemic of the 21st century,” and the lack of stress-management information, resources, and support during pregnancy is negatively impacting mothers, their families, and communities.⁸ The signs and symptoms of stress are vast and often vary from person to person, but may include changes in:

The areas of feelings (anxiety, depression, irritability, fatigue), behavior (withdrawn, aggressive, tearful, unmotivated), and thinking (difficulties of concentration and problem solving) or physical symptoms (palpitations, nausea, and headaches). Persistent stress might lead to changes in neuroendocrine, cardiovascular, autonomic, and immunological functioning, leading to mental and physical ill-health (anxiety, depression, heart disease, etc.).⁹

The health consequences stress causes are of dire concern in the general population but are even more dangerous during pregnancy, as the body’s natural stress response competes with the mother’s rapidly changing hormones. In the first three months of pregnancy, also referred to as the first trimester, emotional disturbances are exceptionally high as the body adapts to higher

⁶ Teresa Marino, “Viral Infections and Pregnancy: Background, Clinical Presentation, Workup,” Medscape, November 11, 2021, <https://emedicine.medscape.com/article/235213-overview>.

⁷ Ibid.

⁸ Manisha Arora et al., “Stress: Prevalence and Correlates among Residents of a Suburban Area,” *Industrial Psychiatry Journal* 28, no. 1 (2019): 98, accessed March 27, 2020, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6929229/>.

⁹ Ibid.

levels of estradiol and progesterone during early pregnancy.¹⁰ Once the body has had time to adjust to and regulate the influx of hormones, mood-related symptoms usually wear off; however, some women experience them throughout their entire pregnancy.¹¹ On a chemical and hormonal basis, a woman's body may have adapted to and regulated mood-altering hormones, but it is still common for women to feel anxious and overwhelmed by other factors throughout pregnancy. Most common maternal stressors and worries include the mother's ability to care for her child, how their relationship with their husband, family, and friends may change, how she will manage financially, how to best support her growing baby nutritionally, what birth will be like, weight gain, work stresses, and so on. Additionally, "popular interpretations of what pregnancy should be like, for example, that pregnancy is a happy time when women enjoy the satisfaction of fulfilling a valuable reproductive role in the society, negatively affects those who are already vulnerable to distress and low moods."¹²

In addition to the negative influences on maternal health due to various stressors, research shows that "exposure to prenatal stress is linked to health consequences in the offspring."¹³ Therefore, it is important to "timely treat pregnant women that are greatly affected by mental

¹⁰ National Childbirth Trust, "Pregnancy Hormones: Progesterone, Oestrogen and the Mood Swings," *NCT (National Childbirth Trust)*, last modified July 10, 2019, <https://www.nct.org.uk/pregnancy/how-you-might-be-feeling/pregnancy-hormones-progesterone-oestrogen-and-mood-swings>.

¹¹ Ibid.

¹² Maren Goetz et al., "Effects of a Brief Electronic Mindfulness-Based Intervention on Relieving Prenatal Depression and Anxiety in Hospitalized High-Risk Pregnant Women: Exploratory Pilot Study," *Journal of Medical Internet Research* 22, no. 8 (August 11, 2020): e17593, accessed October 22, 2021, <https://pubmed.ncbi.nlm.nih.gov/32780023/>.

¹³ Nishan Lamichhane et al., "Associations between Maternal Stress during Pregnancy and Offspring Obesity Risk Later in Life—a Systematic Literature Review," *Obesity Reviews* 21, no. 2 (October 23, 2019), accessed January 18, 2021, <https://onlinelibrary.wiley.com/doi/full/10.1111/obr.12951>.

health problems to potentially reduce adverse birth outcomes.”¹⁴ This is precisely where the medical system is failing women, as maternal mortality rates in the United States continue to increase from year to year. In a recent report, The Centers for Disease Control (CDC) reported that in 2021, 1,205 women died of maternal causes, compared with 861 in 2020 and 754 in 2019.¹⁵ While life-saving technology continues to rapidly advance and many healthcare treatments drastically improve, maternal mortality in the United States continues to rise at an alarming rate. With a focus on the medicalization of birth for profit purposes, natural alternatives for stress management and prenatal care during pregnancy are rarely considered an option because they are simply not as profitable and would replace the need for medications, pharmaceuticals, and much of the medical practices carried out during pregnancy and birth. As an alternative, mindfulness interventions, including music, can be employed as a non-invasive, affordable treatment for prenatal stress, as “studies have shown a decrease in pregnancy-related stress and anxiety in expectant mothers following mindfulness programs.”¹⁶

Statement of the Problem

Although pregnancy is typically a time in a woman’s life when she is often very focused on her health and well-being, stress management seems to be an overlooked area in prenatal care. Many stress management treatments offered to pregnant women today are pharmaceutical-based,

¹⁴ Janina Eichler et al., “Maternal Depressive Symptoms and Stress during Pregnancy as Predictors of Gestational Age at Birth and Standardized Body Mass Index from Birth up to 2 Years of Age,” *BMC Pregnancy and Childbirth* 21, no. 1 (September 18, 2021), accessed October 18, 2021, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8449913/>.

¹⁵ Donna L. Hoyert, “Maternal Mortality Rates in the United States, 2021,” www.cdc.gov, March 16, 2023, <https://www.cdc.gov/nchs/data/hestat/maternal-mortality/2021/maternal-mortality-rates-2021.htm#:~:text=The%20increases%20from%202020%20to>.

¹⁶ Goetz et al., “Effects of a Brief Electronic Mindfulness-Based Intervention.”

which often come with serious side effects. In the United States, the typical schedule of prenatal care includes provider visits every four weeks until twenty-eight weeks, every two weeks until thirty-six weeks, and then weekly until birth.¹⁷ These fairly frequent, but short visits are often only five to ten minutes in length and women are not given the time to discuss their pregnancy, birth plan, or other concerns. If concerns are raised, women are typically given a medical prescription for any ailments they are experiencing and sent out the door. Providers do not spend the time discussing alternative options and informed consent, which can be anxiety inducing and stressful for many women. While a quick Google search provides many suggested treatments for chronic stress during pregnancy, suggestions are vague, confusing, and difficult for women to implement practically in their lives. Music therapy is arguably the most underused yet most effective treatment for stress management during pregnancy. However, an evidence-based protocol to support women throughout pregnancy is not readily available. Additionally, there is not currently any literature available that details how music can be used as an alternative treatment for stress management throughout the prenatal period.

Statement of the Purpose

The purpose of this study is to explore how practitioners and women can access music for continuous stress management during pregnancy. During pregnancy, women experience many changes spiritually, emotionally, physically, and mentally, some or all of which can increase stress levels. Through observing group prenatal music classes, interviewing class participants, and teaching expectant mothers stress management skills through music, this study aims to demonstrate that music interventions during pregnancy can positively affect maternal stress

¹⁷ UCLA Health, "Schedule of Prenatal Care," accessed October 13, 2023, https://www.uclahealth.org/sites/default/files/documents/Schedule_of_Prenatal_Care.pdf.

levels, improving the health of both the mother and her developing child and leading to better outcomes during labor and birth.

Significance of the Study

While much literature demonstrates the benefits of music for stress management in other clinical settings, there are insufficient studies showing how music can be accessed for stress management throughout pregnancy. In the modern medicalized world, many women do not maintain access to compassionate care during pregnancy, and if they do, it is often unaffordable. Although stress, anxiety, and depression are discussed more regularly in today's culture, these psychological conditions are still often considered taboo, especially during pregnancy. This study is of theoretical significance because it seeks to gain a new understanding of the up-and-coming field of arts in health, specifically concerning pregnancy. This study's results will help advance the field of compassionate prenatal care for stress management and provide an alternative to pharmaceutical medicines.

If group prenatal music classes are shown to be successful in the treatment of stress during pregnancy, it is proposed that a prenatal music education curriculum should be developed and marketed to prenatal and obstetric providers, family doctors, midwives, doulas, and women to facilitate stress-reducing musical techniques and programs during pregnancy. This study is of empirical significance because it has the potential to help women all over the world deal with stress during pregnancy in a way that is natural, cost-effective, side-effect-free, and joyful. Music, music interventions, and music therapy are all tools that can be implemented more prevalently in prenatal care.

While much research demonstrates the power of music for stress management and the treatment of anxiety and depression in pregnant women, prenatal music programs, educational

techniques, and practitioner training in these areas are not readily available. If providers want to implement music in their practices, a music curriculum, program, educational techniques, and practitioner training opportunities must be made available and accessible in order to best serve women during the prenatal period. This study is of practical significance, as it demonstrates how music positively influences prenatal stress management and why providers should incorporate music as an alternative therapy in their practices.

Research Question and Sub Questions

This study seeks to address the central research question:

How do music interventions affect stress levels during pregnancy? Additional sub-questions include:

How can practitioners implement music interventions as a holistic approach to stress management during pregnancy?

How do music interventions affect pregnancy outcomes?

Definition of Terms

The terms and definitions listed below are relevant to this study and are sourced from peer-reviewed literature.

1. *Multiparous*: Describing a woman who has previously given birth.¹⁸
2. *Music Therapy*: A health treatment rooted in both empirical evidence and artistic expression. It employs musical experiences within a therapeutic connection to cater to clients' physical, emotional, cognitive, and social requirements.¹⁹
3. *Perinatal Period*: The short period of time, usually weeks, immediately before and after birth.²⁰
4. *Postpartum Depression (PPD)*: Experienced by 10-30 percent of women, it is characterized by significant bouts of tearfulness, mood swings, despondency, inability to cope with the infant's care, and increasing guilt about the birth and performance as a mother. Fatigue, irritability, impaired concentration, and anxiety may also be present.²¹
5. *Postpartum Psychosis*: Onset typically occurs within three weeks of delivery. Symptoms include psychotic events, disturbance with major effect, and schizophrenic ideation.²²

¹⁸ Gizell Green, Riki Tesler, and Adilson Marques, "Primiparous and Multiparous Women's Mode of Birth and Negative Emotions," *International Journal of Environmental Research and Public Health* 19, no. 9 (April 25, 2022): 5189, accessed June 2, 2022, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9103235/>.

¹⁹ Thomas Stegemann et al., "Music Therapy and Other Music-Based Interventions in Pediatric Health Care: An Overview," *Medicines* 6, no. 1 (February 14, 2019): 25, <https://doi.org/10.3390/medicines6010025>.

²⁰ Gabriel R. Fries and Consuelo Walss-Bass, *Chapter 4 - Gene-Environment Interactions in High-Risk Populations* (Academic Press, 2018), <https://doi.org/10.1016/B978-0-12-812347-8.00004-X>.

²¹ S.C. Butler and H. Als, "Screening, Newborn, and Maternal Well-Being," in *Encyclopedia of Infant and Early Childhood Development*, ed. Janette B. Benson (Elsevier, 2020), <https://www.sciencedirect.com/science/article/abs/pii/B9780128093245058806>.

²² Ibid.

6. *Perinatal Depression*: Perinatal depression is linked to a wide range of adverse consequences for women, children, and families, including weakened maternal-fetal attachment, unfavorable neonatal outcomes such as low birth weight, preterm birth, and small size for gestational age, compromised infant attachment, delays in early childhood development, and strained relationships.²³
7. *Prenatal Period*: The gestational period from conception to birth.²⁴
8. *Prenatal Maternal Stress*: The stress that mothers experience during pregnancy.²⁵
 - a. *Objective Stress*: Quantifies the level of adversity experienced by a woman during periods of stress, encompassing factors such as the duration of exposure to stressors, the disruptions to her daily routine, and any tangible losses suffered, such as financial or property setbacks.²⁶
 - b. *Subjective Stress*: Pertains to a woman's individual response to the stressor and can be gauged by evaluating her emotional and affective responses during her exposure to the stressful incident.²⁷
9. *Primiparous*: Describing a woman who is giving birth for the first time.²⁸

²³ Jeanne L. Alhusen and Carmen Alvarez, "Perinatal Depression," *The Nurse Practitioner* 41, no. 5 (May 2016): 50–55, <https://doi.org/10.1097/01.npr.0000480589.09290.3e>.

²⁴ Thorhildur Halldorsdottir, Heiddis B. Valdimarsdottir, and Unnur A. Valdimarsdottir, "Chapter 12 - Adversity across Time: Do Sensitive Periods across the Life Span Determine Adversity-Induced Epigenetic Changes?," ed. Nagy A. Youssef, *ScienceDirect* (Academic Press, January 1, 2022), last modified January 1, 2022, accessed May 29, 2023, <https://www.sciencedirect.com/science/article/pii/B9780128230398000071>.

²⁵ McGill University, "What Is Prenatal Maternal Stress?," Stress in Pregnancy International Research Alliance, n.d., <https://www.mcgill.ca/spiral/spiral/prenatal-stress>.

²⁶ McGill University, "What Is Prenatal Maternal Stress?,"

²⁷ Ibid.

²⁸ Gizell Green, Riki Tesler, and Adilson Marques, "Primiparous and Multiparous."

Summary

While Arts-in-Health is becoming a more prevalent form of alternative care, there are still limited arts-in-health care options available for women who experience stress during pregnancy. Music is one of the most valuable tools for naturally treating prenatal depression, yet most women do not maintain access to this type of care. Additionally, medical practitioners do not have the resources to provide this type of alternative care, and there are few, if any, women's health/musical experts who are trained in this specialized field.

The purpose of this qualitative hermeneutic phenomenological study was to examine how music interventions influence stress levels during pregnancy. The findings may be of value to researchers, medical practitioners, obstetrician-gynecologists, family doctors, midwives, prenatal care providers, childbirth educators, doulas, music educators, and mothers alike.

Chapter Two: Literature Review

Overview

A systematic review of the literature was conducted to explore the impact of stress on the mother and child during pregnancy, techniques and practices for stress management during pregnancy, the positive influences of music interventions during pregnancy, the benefits of group support during pregnancy, and finally, how music can be used during pregnancy as a natural, cost-effective, and easily accessible treatment for stress, anxiety, and depression.²⁹ Using the Theoretical Framework of Acceptability (TFA), developed by Mandeep Sekhon, Martin Cartwright, and Jill J. Francis in 2017, this study seeks to understand how participants engage with and respond to music interventions. In the first section, an overview of the impacts of stress on maternal-fetal outcomes, fetal development, maternal-fetal bonding, and attachment will be discussed. The second section synthesizes recent literature on music use for stress, anxiety, and depression management. The third section explores literature detailing how music can be an alternative to pharmaceutical approaches.³⁰ Finally, the chapter concludes with how prenatal care can be improved by introducing music interventions into healthcare practices. This chapter introduces the current issues in prenatal care and how music can address these challenges to better support mothers and their babies during pregnancy.

²⁹ Lindsay S Uman, "Systematic Reviews and Meta-Analyses," *Journal of the Canadian Academy of Child and Adolescent Psychiatry = Journal de l'Académie Canadienne de Psychiatrie de l'Enfant et de L'adolescent* 20, no. 1 (February 2011): 57–59.

³⁰ Guy Paré and Spyros Kitsiou, *Handbook of EHealth Evaluation*, *Www.ncbi.nlm.nih.gov* (University of Victoria, 2017), 9.1, <https://www.ncbi.nlm.nih.gov/books/NBK481583/#:~:text=Among%20other%20methods%2C%20literature%20reviews>.

Theoretical Framework

This research study applies a hermeneutic phenomenology approach as a framework, which researchers have “widely used to understand lived experiences.”³¹ Prenatal stress, anxiety, and depression are not universal conditions and are experienced differently by each woman. A hermeneutic phenomenological study asserts individuals’ unique life stories and values their perspectives and personal experiences.³² Hermeneutic phenomenological studies help researchers understand subjective experiences, gain insight into people’s motivations and actions, and reduce the need for assumptions.³³ A phenomenological approach is often implemented in medical education and music therapy research, making it an ideal approach for this study that combines women’s health and music education.³⁴

Additionally, this study employs the Theoretical Framework of Acceptability (TFA), developed by Mandeep Sekhon, Martin Cartwright, and Jill J. Francis in 2017.³⁵ Used in various disciplines, including psychology, linguistics, sociology, and more, the concept of acceptability has been explored and discussed in numerous academic and applied contexts, leading to its incorporation into research and practical applications.³⁶ The TFA is most commonly used in

³¹ Maureen Miles et al., “Hermeneutic Phenomenology: A Methodology of Choice for Midwives,” *International Journal of Nursing Practice* 19, no.4 (May 13, 2013): 409-414.

³² Ibid.

³³ Jennifer Anne Cleland, “The Qualitative Orientation in Medical Education Research,” *Korean Journal of Medical Education* 29, no. 2 (May 29, 2017): 61–71, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5465434/>.

³⁴ Ibid.

³⁵ Mandeep Sekhon, Martin Cartwright, and Jill J. Francis, “Acceptability of Health Care Interventions: A Theoretical Framework and Proposed Research Agenda,” *British Journal of Health Psychology* 23, no. 3 (February 16, 2018): 519–31, <https://doi.org/10.1111/bjhp.12295>.

³⁶ Tess Tsindos, “Chapter 4: Theoretical Frameworks for Qualitative Research,” *Oercollective.caul.edu.au*, March 21, 2023, https://oercollective.caul.edu.au/qualitative-research/chapter/_unknown_-4/.

healthcare settings and “has become a key consideration in the design, evaluation, and implementation of healthcare interventions.”³⁷

The primary goal of the TFA is to understand and measure the degree to which something is considered acceptable or appropriate within a given context or community.³⁸ In healthcare specifically, Sekhon et al. propose the following definition of acceptability: “A multi-faceted construct that reflects the extent to which people delivering or receiving a healthcare intervention consider it appropriate, based on anticipated or experienced cognitive and emotional responses to the intervention.”³⁹ In summary, acceptability involves examining people’s attitudes, opinions, and judgments to determine what is desirable or permissible and what is not.⁴⁰

There are seven key components that guide the TFA.⁴¹ The first component, affective attitude, explores how individuals feel about interventions.⁴² The second component, burden, is the perceived level of effort necessary for engaging in the intervention.⁴³ The third component, ethicality, is the degree to which the intervention aligns well with an individual’s values.⁴⁴ The

³⁷ Mandeep Sekhon, Martin Cartwright, and Jill J. Francis, “Acceptability of Healthcare Interventions: An Overview of Reviews and Development of a Theoretical Framework,” *BMC Health Services Research* 17, no. 1 (January 26, 2017), <https://doi.org/10.1186/s12913-017-2031-8>.

³⁸ Sekhon, Cartwright, and Francic, “Acceptability of Health Care Interventions.”

³⁹ Sekhon, Cartwright, and Francic, “Acceptability of Health Care Interventions: An Overview.”

⁴⁰ Olga Perski and Camille E Short, “Acceptability of Digital Health Interventions: Embracing the Complexity,” *Translational Behavioural Medicine* 11, no. 7 (May 8, 2021): 1473-80, <https://doi.org/10.1093/tbm/ibab048>

⁴¹ Elizabeth Deja et al., “Establishing and Augmenting Views on the Acceptability of a Paediatric Critical Care Randomised Controlled Trial (the FEVER Trial): A Mixed Methods Study,” *BMJ Open* 11, no. 3 (March 10, 2021): e041952, <https://doi.org/10.1136/bmjopen-2020-041952>.

⁴² Sekhon, Cartwright, and Francic, “Acceptability of Health Care Interventions: An Overview.”

⁴³ Ibid.

⁴⁴ Ibid.

fourth component, intervention coherence, is the degree to which the participant comprehends the intervention and its functioning.⁴⁵ The fifth component, opportunity costs, is the degree to which individuals need to sacrifice benefits, profits, or values to participate in the intervention.⁴⁶ The sixth component, perceived effectiveness, is the perceived likelihood of the intervention achieving its intended purpose.⁴⁷ Finally, the seventh component, self-efficacy, is the participant's belief in their ability to carry out the required behaviors for engaging in the intervention.⁴⁸ To assess the acceptability of an intervention, three temporal perspectives can be used, "depending on the timing of assessment in relation to engagement with the intervention."⁴⁹ These include prospective acceptability, which takes place before the intervention; concurrent acceptability, which takes place while participating in the intervention; and retrospective acceptability, which takes place after participating in the intervention. This study will employ all three temporal perspectives.

Many reputable studies have previously developed this theoretical framework. The first study example, by Timm et al., aimed to create and evaluate a measurement scale for gauging acceptance of a health coaching intervention conducted via telephone. The study sought to determine the intervention's acceptability among participants residing in socio-economically

⁴⁵ Sekhon, Cartwright, and Francic, "Acceptability of Health Care Interventions: An Overview."

⁴⁶ Ibid.

⁴⁷ Ibid.

⁴⁸ Ibid.

⁴⁹ Ibid.

disadvantaged areas in Stockholm who either had diabetes or were at high risk of diabetes. A TFA-based questionnaire was utilized for this purpose.⁵⁰

Similarly, a study by Renko et al. “describes the nationwide implementation of a program targeting physical activity and sedentary behavior in vocational schools.”⁵¹ While this study focused on interventions in the field of education, it also employed the TFA to determine the acceptability of new training. These study examples provide insight into the validity and benefit of incorporating the TFA in healthcare and educational studies.

The TFA provided a structured and organized perspective that guided the understanding, analysis, and interpretation of existing research and information in this study. Additionally, the TFA provided a lens through which the researcher viewed the literature, which helped clarify specific concepts, theories, variables, and relationships relevant to this study. Furthermore, the TFA framework promoted thorough integration of the related literature and contributed to building a more comprehensive understanding of the field of study.

Related Literature

The related literature includes a review of existing knowledge about the impact and influence of stress and how music can be beneficial during pregnancy. This section examines the convergence of arts and healthcare through recent studies and literature and explores how this emerging field is growing and expanding. This section is broken down into four primary areas of focus: the impacts of stress; music for stress, anxiety, and depression management; music

⁵⁰ Linda Timm et al., “Application of the Theoretical Framework of Acceptability to Assess a Telephone-Facilitated Health Coaching Intervention for the Prevention and Management of Type 2 Diabetes,” ed. Kingston Rajiah, *PLOS ONE* 17, no. 10 (October 6, 2022): e0275576, <https://doi.org/10.1371/journal.pone.0275576>.

⁵¹ Elina Renko et al., “Acceptability, Reach and Implementation of a Training to Enhance Teachers’ Skills in Physical Activity Promotion,” *BMC Public Health* 20, no. 1 (October 16, 2020), <https://doi.org/10.1186/s12889-020-09653-x>.

interventions as an alternative to traditional pharmaceutical approaches; and improving prenatal healthcare practices with music interventions.

The Impacts of Stress

Negative emotional states and maternal stress negatively impact the mental health of the mother and her developing child.⁵² From prenatal distress to postpartum mental disorders, maternal stress causes altered fetal and infant development and can influence a child's emotional and behavioral psychopathology development, affecting the child throughout their lifespan.⁵³ To avoid or manage the negative impacts of maternal stress, Bauer et al. explored how relaxation techniques during pregnancy can reduce maternal stress and improve maternal well-being.⁵⁴ This study employed three relaxation techniques: listening to music, following guided imagery, and resting or sitting quietly.⁵⁵ This study determined that all three relaxation techniques “decreased skin conductance, $F(3,94) = 18.011, p = .001, \eta_p^2 = .365$, and subjective stress levels after the interventions with no significant group difference.”⁵⁶ As a result, this study concluded that a single, twenty-minute relaxation intervention of listening to music, following guided imagery, or resting can significantly reduce maternal stress and positively influence fetal development.⁵⁷

Pregnancy stress can harm the developing child and increase the child's risk of having adverse neurodevelopmental outcomes, including “emotional problems, symptoms of attention

⁵² Ilena Bauer et al., “Acute Relaxation during Pregnancy Leads to a Reduction in Maternal Electrodermal Activity and Self-Reported Stress Levels,” *BMC Pregnancy and Childbirth* 21, no. 1 (September 17, 2021), <https://doi.org/10.1186/s12884-021-04099-4>.

⁵³ Ibid.

⁵⁴ Ibid.

⁵⁵ Ibid.

⁵⁶ Ibid.

⁵⁷ Ibid.

deficit hyperactivity disorder, or impaired cognitive development.”⁵⁸ Furthermore, research shows that prenatal anxiety or depression contributes to ten to fifteen percent of emotional and behavioral outcomes in children.⁵⁹ From severe stressors, such as a death in the family, to mild stressors, like daily hassles, prenatal stress can cause lower birthweight, early delivery, induced hypertension, reduction of brain grey matter density, cognitive and intellectual impairment, altered function of the hypothalamic-pituitary-adrenal (HPA axis), and an increased risk of autism, childhood emotional problems, anxiety, depression, schizophrenia, and asthma.⁶⁰ This study demonstrated the potential adverse outcomes associated with prenatal stress and noted that managing maternal stress during pregnancy is one of the most neglected areas of obstetric care.⁶¹

Although pregnancy is a normal and natural physiological phenomenon, it is associated with an array of challenges. From psychosocial to emotional changes, socioeconomic to physical changes, a pregnant mother experiences many large-scale alterations that require physical, mental, and social adaptation.⁶² As a result of these many changes, it is obvious how stress may be more prevalent in a mother’s life. While temporarily increased stress levels during pregnancy are considered normal, Guo et al. noted that excessive stress can endanger the mother’s health.⁶³ Stress during pregnancy was linked to increased repercussions, including miscarriage,

⁵⁸ Vivette Glover, “Maternal Depression, Anxiety and Stress during Pregnancy and Child Outcome; What Needs to Be Done,” *Clinical Obstetrics & Gynaecology* 28, no. 1 (January 1, 2014): 25–35, <https://www.clinicalkey.com/#!/content/journal/1-s2.0-S1521693413001326>.

⁵⁹ Ibid.

⁶⁰ Ibid.

⁶¹ Ibid.

⁶² Pingping Guo et al., “Mind–Body Interventions on Stress Management in Pregnant Women: A Systematic Review and Meta-Analysis of Randomized Controlled Trials,” *Journal of Advanced Nursing* 77, no. 1 (October 13, 2020), <https://doi.org/10.1111/jan.14588>.

⁶³ Ibid.

postpartum mental disorders, stillbirth, nausea and vomiting, preeclampsia, fetal malformations, preterm birth, and low birth rate.⁶⁴ Additionally, high stress levels increase a mother's likeliness of engaging in adverse health activities, including prenatal smoking and early cessation of breastfeeding.⁶⁵ Regarding long-term childhood development, Guo et al. noted that prenatal stress "might be associated with long-term neurodevelopmental impairments in their children, which manifested as cognitive, emotional, and neurodevelopmental disorders among infants, as well as autism, schizophrenia, and attention deficit in these child's adult life."⁶⁶ In light of the many harmful consequences associated with prenatal stress, Guo et al., suggested that "finding effective ways to help pregnant women to manage antenatal stress is very urgent."⁶⁷

The effects of prenatal stress pose a significant concern for pregnant mothers and their developing children. With the prevalence of antenatal anxiety ranging from 18.2 percent in the first trimester to 24.6 percent in the third trimester, stress affects many expecting mothers.⁶⁸ In this study, Arnon noted a lack of stress management interventions available during pregnancy and suggested that "there is an essential need for stress relief during pregnancy."⁶⁹ Furthermore, music-based interventions were suggested, as they are low-cost, easily accessible, and highly acceptable among participants.⁷⁰

⁶⁴ Guo et al., "Mind-Body Interventions."

⁶⁵ Ibid.

⁶⁶ Ibid.

⁶⁷ Ibid.

⁶⁸ Shmuel Arnon, "Music Therapy for Hospitalized Pregnant Women – the Way to Go Forward," *Nordic Journal of Music Therapy* 28, no. 1 (December 15, 2018): 4–6, <https://doi.org/10.1080/08098131.2018.1554695>.

⁶⁹ Ibid.

⁷⁰ Ibid.

While the influence of maternal stress is evident on maternal mental health and fetal development, Navon-Eyal and Tubam explored a less common area of study: how maternal-fetal bonding and attachment influence stress.⁷¹ While this study mainly examined how the COVID-19 pandemic was a significant source of stress for expectant mothers, the exploration of pregnancy stress in this study was not limited to COVID-19 as the sole stressor. Pregnancy stress is “the experience of stress stemming from the pregnancy itself, and includes concerns regarding the physical symptoms of pregnancy, bodily changes, changes in interpersonal relationships, the health of the fetus or mother, the upcoming childbirth, or caring for the future.”⁷² In this study, Navon-Eyal and Tubam determined that women who experience stressors during pregnancy are more prone to lower well-being.⁷³ Additionally, they found that maternal-fetal bonding plays a protective role against stress and that interventions aimed at strengthening the maternal-fetal bond may help mothers become more resilient to stress, which, therefore, promotes their well-being during pregnancy.⁷⁴

Cesarean sections are a common abdominal surgery at the end of pregnancy, and while this process ultimately brings forth the meeting of mother and baby, it can also be very stressful. While some women elect to have a cesarean section, many women are forced to have a cesarean section due to failure to progress, fetal distress, or other medical conditions that may arise during labor. From the stress of the surgery to the post-surgery recovery, this major surgery is not only

⁷¹ Meital Navon-Eyal and Orit Taubman, “Psychological Well-Being during Pregnancy: The Contribution of Stress Factors and Maternal-Fetal Bonding,” *Journal of Reproductive and Infant Psychology*, June 9, 2023, 1–15, <https://doi.org/10.1080/02646838.2023.2222143>.

⁷² Ibid.

⁷³ Ibid.

⁷⁴ Ibid.

physically stressful for the mother, but also an emotionally and psychologically stressful, too. In the time leading up to a cesarean, “increased levels of stress and anxiety can negatively affect pain perception and the usage of analgesics postoperatively, as well as the new mother’s lactation.”⁷⁵ While some pharmaceuticals can be administered to help with pain and anxiety, limited pharmacological options are safe for mothers and babies.⁷⁶

After the baby’s birth, the mother’s needs are often given a lower priority than her physical well-being.⁷⁷ While everyone is focused on the excitement of a new baby, the stress and anxiety the freshly postpartum mother is experiencing are not usually acknowledged or managed. In this study, Kristen, Fallek, and Benattar discussed how music therapy positively influences maternal stress levels by providing emotional support for women and encouraging maternal-baby bonding during hospitalization.⁷⁸ With the knowledge that maternal stress can significantly impact maternal-baby bonding and have a consequential influence on the rest of the child’s life, the authors suggested that care providers must quickly provide support services and self-care education to newly postpartum women to support their mental health.⁷⁹

⁷⁵ Philip Hepp et al., “Effects of Music Intervention during Caesarean Delivery on Anxiety and Stress of the Mother a Controlled, Randomised Study,” *BMC Pregnancy and Childbirth* 18, no. 1 (November 3, 2018), <https://doi.org/10.1186/s12884-018-2069-6>.

⁷⁶ Ibid.

⁷⁷ Kristen Corey, Ronit Fallek, and Maya Benattar, “Bedside Music Therapy for Women during Antepartum and Postpartum Hospitalization,” *The American Journal of Maternal/Child Nursing* 44, no. 5 (September 2019): 277–83, <https://oce.ovid.com/article/00005721-201909000-00005/HTML>.

⁷⁸ Ibid.

⁷⁹ Ibid.

From the rapid changing of hormones to the many requirements of the new maternal role, postpartum can be an overwhelming, stressful, transitional time.⁸⁰ For many women, postpartum stress will progress into postpartum depression if symptoms are not dealt with immediately. In postpartum, maternal stress can be caused by the new role of motherhood, changes in relationships, bodily changes, economic demands, and a lack of a social network and support.⁸¹ From economic to emotional stress and psychological to physical stress, Hung and Chung suggested that maternal support systems are necessary as a stress and depression coping strategy for postpartum mothers.⁸²

Music for Stress, Anxiety, and Depression Management during Pregnancy and Postpartum

As a low-cost, easily accessible, and highly acceptable form of treatment, music-based interventions have become increasingly popular in the search to find reliable treatment for reducing anxiety and stress during pregnancy and postpartum. In a study that explored how music therapy can be used to reduce stress and anxiety for hospitalized women, Arnon discovered that when participants took part in three half-hour group music therapy sessions on three consecutive days, there was a significant effect on participants' heart rate variability (HRV), which is strongly influenced by pain, stress, and anxiety.⁸³ Additionally, participants' self-reported anxiety levels were significantly reduced during the three-day period.⁸⁴ This study

⁸⁰ Chich-Hsiu Hung and Hsin-Hsin Chung, "The Effects of Postpartum Stress and Social Support on Postpartum Women's Health Status," *Journal of Advanced Nursing* 36, no. 5 (December 2001): 676–84, <https://doi.org/10.1046/j.1365-2648.2001.02032.x>.

⁸¹ Hung and Chung, "The Effects of Postpartum Stress."

⁸² *Ibid.*

⁸³ Arnon, "Music Therapy for Hospitalized Pregnant Women."

⁸⁴ *Ibid.*

holds some limitations, as it was short in duration and intensity, so further investigation in this area is recommended to provide conclusive results.

Music therapy has been used as a form of psychological healing throughout history and is a natural approach with no side effects that is cost effective and convenient.⁸⁵ When looking at the neurochemical effects of music, music facilitates positive health outcomes by altering several essential neurochemicals that restore the body's stress response and facilitates a relaxation response.⁸⁶ While music therapy has been used in several areas of healthcare, the effects of music listening on maternal stress during pregnancy are not often studied. In a study by Chang, Yu, Chen, and Chen that compared stress levels of pregnant mothers who received routine prenatal care and music listening and a control group that received routine prenatal care only, the authors determined that music listening was effective in helping pregnant women cope with stress.⁸⁷ As a result of this study, it was determined that a two-week music-listening intervention may help expectant mothers cope with stress.⁸⁸

While research demonstrating the impact of music on human health continues to grow, there are still limited investigations in this unique area of study. To address this gap, Thoma et al. conducted a study where participants either listened to relaxing music, the sound of rippling water, or rested without acoustic stimulation before they were exposed to a standardized

⁸⁵ Hsing-Chi Chang et al., "The Effects of Music Listening on Psychosocial Stress and Maternal-Fetal Attachment during Pregnancy," *Complementary Therapies in Medicine* 23, no. 4 (August 2015): 509–15, <https://doi.org/10.1016/j.ctim.2015.05.002>.

⁸⁶ Ibid.

⁸⁷ Ibid.

⁸⁸ Ibid.

psychosocial stress test.⁸⁹ The findings of this study indicated that music listening most highly influenced the psychobiological stress system and that listening to music before experiencing a stressor positively affected the autonomic nervous system, promoted a faster recovery, and prompted a less severe endocrine and psychological response.⁹⁰ While this study does not necessarily focus on stress during pregnancy, it is evident that listening to music before a stressful event positively influences several bodily stress responses.⁹¹

In a preliminary prospective cohort study, Fancourt and Perkins found that mothers who listened to recorded music for twelve weeks, twenty minutes per day, significantly improved their anxiety and depression scores. Additionally, the authors found that listening to music for just thirty minutes reduced cortisol and anxiety levels in expectant mothers.⁹² These findings demonstrated that pregnant women might benefit from regular music listening for stress and anxiety management. Not limited to pregnancy, the authors also determined that listening to music in the third trimester could be protective against postpartum depression symptoms and low well-being post-birth.⁹³

Despite its name, the non-stress test (NST), which checks the baby's heartbeat patterns in utero toward the end of pregnancy, can cause mothers to experience high stress and anxiety

⁸⁹ Myriam V. Thoma et al., "The Effect of Music on the Human Stress Response," ed. Robert L. Newton, *PLoS ONE* 8, no. 8 (August 5, 2013): e70156, <https://doi.org/10.1371/journal.pone.0070156>.

⁹⁰ Thoma et al., "The Effect of Music on the Human Stress Response."

⁹¹ *Ibid.*

⁹² Daisy Fancourt and Rosie Perkins, "Could Listening to Music during Pregnancy Be Protective against Postnatal Depression and Poor Wellbeing Post Birth? Longitudinal Associations from a Preliminary Prospective Cohort Study," *BMJ Open* 8, no. 7 (July 1, 2018): e021251, <https://doi.org/10.1136/bmjopen-2017-021251>.

⁹³ *Ibid.*

levels.⁹⁴ In a study that explored the effect of music interventions on maternal stress and anxiety and fetal heart rate pattern during the non-stress test, Oh et al. determined that the experimental group, who received music intervention during the NST showed significantly lower anxiety scores than the control group.⁹⁵ Additionally, the baseline fetal heart rate was considerably lower, and the fetal heart rate acceleration frequency was significantly increased in the experimental group.⁹⁶ A lower baseline fetal heart rate demonstrates that the fetus is not in distress, and regular fetal heart rate accelerations are normal and healthy, indicating that the baby has an adequate oxygen supply. As a result of this study, the authors concluded that music interventions are effective in reducing maternal anxiety during the NST.⁹⁷

As the value of music therapy becomes more recognized worldwide, it is not surprising that it is slowly making its way into the field of obstetrics. To further explore the effects of music therapy on the psychological health of expectant mothers, Chang, Chen, and Huang conducted a study where the experimental group received two weeks of music intervention and the control group received only general prenatal care.⁹⁸ After two weeks, the music therapy experimental group showed a significant decrease in three self-reported psychological health assessments: perceived stress scale (PSS), scale of the state-trait anxiety inventory (S-STAI), and Edinburgh

⁹⁴ Myung Ok Oh et al., “Effect of Music Intervention on Maternal Anxiety and Fetal Heart Rate Pattern during Non-Stress Test,” *Journal of Korean Academy of Nursing* 46, no. 3 (2016): 315–26, <https://web.p.ebscohost.com/ehost/pdfviewer/pdfviewer?vid=0&sid=0b66e098-7f37-428f-ba43-0e859968ddb8%40redis>.

⁹⁵ Oh et al., “Effect of Music Intervention on Maternal Anxiety.”

⁹⁶ Ibid.

⁹⁷ Ibid.

⁹⁸ Mei-Yueh Chang, Chung-Hey Chen, and Kuo-Feng Huang, “Effects of Music Therapy on Psychological Health of Women during Pregnancy,” *Journal of Clinical Nursing* 17, no. 19 (October 2008): 2580–87, <https://doi.org/10.1111/j.1365-2702.2007.02064.x>.

postnatal depression scale (EPDS), while the control group only showed a less substantial decrease in the PSS after two weeks.⁹⁹ As a result, the authors determined that a two-week music therapy intervention during pregnancy has quantifiable psychological benefits and positively influences stress, anxiety, and depression in pregnant mothers.¹⁰⁰

With an alarming percentage of pregnant women in the United States (eighty-four percent) experiencing some level of stress during pregnancy, there is a need for natural and accessible stress management interventions to support women during this extraordinary journey. In a systematic review of music interventions to reduce stress and anxiety in pregnancy, Corbijn van Willenswaard et al. determined that music interventions significantly reduced levels of maternal anxiety.¹⁰¹ Music interventions in this systematic review included passive music interventions, like listening to music, and active music interventions, like lessons, group workshops, or therapy.¹⁰² The authors noted that while there is evidence that music interventions may reduce stress and anxiety during pregnancy, additional research is warranted.¹⁰³

When pregnant mothers listen to music, perform music, and sing, their stress levels are lower, which improves fetal and neonatal development.¹⁰⁴ Although babies in the womb cannot

⁹⁹ Chang, Chen, and Huang, “Effects of Music Therapy on Psychological Health.”

¹⁰⁰ Ibid.

¹⁰¹ Kyrsten Corbijn van Willenswaard et al., “Music Interventions to Reduce Stress and Anxiety in Pregnancy: A Systematic Review and Meta-Analysis,” *BMC Psychiatry* 17, no. 1 (July 27, 2017), <https://doi.org/10.1186/s12888-017-1432-x>.

¹⁰² Ibid.

¹⁰³ Ibid.

¹⁰⁴ Birgit Arabin and Michael Jahn, “Need for Interventional Studies on the Impact of Music in the Perinatal Period: Results of a Pilot Study on Women’s Preferences and Review of the Literature,” *The Journal of Maternal-Fetal & Neonatal Medicine* 26, no. 4 (November 2012): 357–62, <https://doi.org/10.3109/14767058.2012.733763>.

necessarily understand the meaning of words, they can understand the musicality and rhythm of language and singing.¹⁰⁵ When mothers engage in direct infant speech and sing to their unborn baby, they exchange positive emotions with their unborn baby and increase bonding, which reduces stress.¹⁰⁶ In this study, the authors asked five hundred multiparous women about their music consumption and came to the following conclusions: 72.2 percent of pregnant women listened to music daily or at least once a week, 25.8 percent sang at least once a week, and 4.6 percent performed music regularly.¹⁰⁷ In postpartum, the authors found that all women sang more frequently after delivering their child and listened to more lullabies and play songs and less modern music.¹⁰⁸ Finally, 56.5 percent of mothers intended to sing or play music with their children until they were of school age, and 48.5 percent of women were interested in participating in a pregnancy and postpartum music program.¹⁰⁹ This study demonstrated that music plays an essential role in expectant and new mothers' lives, positively impacting their well-being and stress. Music is an enjoyable activity that provides quantifiable psychological benefits.

Music Interventions as an Alternative to Traditional Pharmaceutical Approaches

As a woman's body changes during pregnancy to accommodate the growing life within her, new aches and pains often accompany this new journey. During pregnancy, 50-70 percent of

¹⁰⁵ Arabin and Jahn, "Need for Interventional Studies on the Impact of Music."

¹⁰⁶ Ibid.

¹⁰⁷ Ibid.

¹⁰⁸ Ibid.

¹⁰⁹ Ibid.

women experience some form of back pain, which for some can be debilitating.¹¹⁰ While pain medication and muscle relaxants may be commonly prescribed to most patients experiencing back pain, many medications are known to pass across the placenta, and their usage in pregnant women is controversial. Consequently, practitioners and expecting mothers exercise extra care when using medications due to their concerns about potential adverse effects on their unborn babies. Acknowledging the need for alternative, natural intervention to manage back pain during pregnancy, Akmeşe and Oran studied the effects of progressive muscle relaxation exercises accompanied by music on low back pain and quality of life during pregnancy.¹¹¹ The researchers discovered that after four and eight weeks of progressive muscle relaxation exercises with music, the intervention group showed significant improvement in perceived pain and experienced an improved quality of life compared to the control group who did not receive an intervention.¹¹² This study demonstrated the benefits of movement and music for lower back pain as an alternative to pharmaceuticals.¹¹³

Pain during labor and birth is very common and may have a negative effect on the mother, fetus, and family.¹¹⁴ While labor pain can be treated using both pharmacological and non-pharmacological methods, complementary and alternative pain relief therapies, including muscle relaxation, breathing techniques, acupuncture, acupressure, aromatherapy, music therapy,

¹¹⁰ Zehra Baykal Akmeşe and Nazan Tuna Oran, “Effects of Progressive Muscle Relaxation Exercises Accompanied by Music on Low Back Pain and Quality of Life during Pregnancy,” *Journal of Midwifery & Women’s Health* 59, no. 5 (June 25, 2014): 503–9, <https://doi.org/10.1111/jmwh.12176>.

¹¹¹ Akmeşe and Oran, “Effects of Progressive Muscle Relaxation Exercises.”

¹¹² Ibid.

¹¹³ Ibid.

¹¹⁴ Faranak Safdari Dehcheshmeh and Hossein Rafiei, “Complementary and Alternative Therapies to Relieve Labor Pain: A Comparative Study between Music Therapy and Hoku Point Ice Massage,” *Complementary Therapies in Clinical Practice* 21, no. 4 (November 2015): 229–32, <https://doi.org/10.1016/j.ctcp.2015.09.002>.

touch therapy, massage therapy, hypnosis, dietary adjustments, and herbal remedies, have become increasingly popular among pregnant women.¹¹⁵ In a comparative study focused on music therapy and Hoku point ice massage, Dehcheshmeh and Rafiei discovered that pain scores were significantly lower at dilations four, six, and eight centimeters following the music therapy and ice massage intervention.¹¹⁶ The analysis demonstrated that participants who participated in the music intervention showed a decreasing trend after the intervention, compared to the group who received Hoku point ice massage and those who only received usual labor care.¹¹⁷ As a result of this study, the researchers concluded that music therapy is a readily available and inexpensive alternative for relieving labor pain.¹¹⁸

While evidence supports the use of music for physical ailments, there is also compelling proof suggesting that involvement with music has the potential to enhance physical and emotional wellness.¹¹⁹ Various music interventions, like participating in group music activities (singing or playing instruments), enjoying music, and undergoing music therapy, have demonstrated their effectiveness in alleviating indications of depression and anxiety.¹²⁰ Music interventions are becoming more prevalent during pregnancy as a non-pharmaceutical approach to supporting prenatal mental health. In a study that explored how music may support perinatal mental health, Sanfilippo, Stewart, and Glover provided a descriptive overview that brought

¹¹⁵ Dehcheshmeh and Rafiei, “Complementary and Alternative Therapies.”

¹¹⁶ Ibid.

¹¹⁷ Ibid.

¹¹⁸ Ibid.

¹¹⁹ Katie Rose M. Sanfilippo, Lauren Stewart, and Vivette Glover, “How Music May Support Perinatal Mental Health: An Overview,” *Archives of Women’s Mental Health* 24, no. 5 (August 28, 2021): 831–39, <https://doi.org/10.1007/s00737-021-01178-5>.

¹²⁰ Ibid.

together examples of research to support this claim.¹²¹ Drawing on both animal and human models, the researchers determined that there is considerable evidence that music interventions can support prenatal mental health by reducing anxiety and pain during labor, improving symptoms of anxiety during pregnancy, and positively affecting symptoms of postnatal depression after birth.¹²² The researchers concluded that music interventions were a low-cost, non-stigmatizing, non-pharmaceutical preventative intervention that positively supports perinatal mental health.¹²³

For many women, thinking about labor and birth brings up many emotions, including fear, worry, and stress. While fear, worry, stress, and anxiety are known to increase the sensation of pain during labor, Chuang et al. discovered that music is a promising and underestimated non-pharmacological approach for relieving labor pain and anxiety, therefore leading to better physical and psychological outcomes of labor.¹²⁴ In this study, the researchers determined that music lowered the pain scores for primiparous women during labor, but the effect of these interventions were not statistically significant.¹²⁵ However, a noteworthy advantage of utilizing music intervention compared to standard care was observed for first-time mothers during childbirth.¹²⁶ As a result of these findings, the researchers suggested that guidelines for

¹²¹ Sanfilippo, Stewart, and Glover, “How Music May Support Perinatal Mental Health.”

¹²² Ibid.

¹²³ Ibid.

¹²⁴ Ching-Hui Chuang et al., “Music Intervention for Pain and Anxiety Management of the Primiparous Women during Labour: A Systematic Review and Meta-Analysis,” *Journal of Advanced Nursing* 75, no. 4 (November 11, 2018): 723–33, <https://doi.org/10.1111/jan.13871>.

¹²⁵ Ibid.

¹²⁶ Ibid.

incorporating music during labor and birth should be formulated and implemented within clinical settings to improve labor's physical and psychological outcomes.¹²⁷

A similar study conducted by Santiváñez-Acosta, Tapia-López, and Santero that assessed the use of music therapy in pain and anxiety management during labor found that listening to music during the latent and active phases of labor resulted in decreased Visual Analogue Scale (VAS) scores for pain intensity.¹²⁸ The results of this study led the researchers to suggest that music can be used as a complementary therapy for physical, mental, and surgical procedures, therefore reducing the need for pharmacological interventions.¹²⁹ With no adverse effects or unfavorable outcomes, the researchers further suggest that music therapy can be recommended to attending physicians as an addition to routine treatment. However, health establishments must have the proper environment and trained professionals to provide music interventions.¹³⁰

Labor is known as one of the most intense pain sources, yet very few non-pharmacological options are presented to women when laboring at the hospital.¹³¹ In a study that examined the effect of music on pain and anxiety in primiparous mothers, Surucu et al. discovered that after the first hour of the three-hour intervention, mothers in labor indicated that their pain was statistically less than the control group.¹³² Noting that pharmacological pain

¹²⁷ Ching-Hui Chuang et al., "Music Intervention for Pain and Anxiety."

¹²⁸ Rocío Santiváñez-Acosta, Elena de las Nieves Tapia-López, and Marilina Santero, "Music Therapy in Pain and Anxiety Management during Labor: A Systematic Review and Meta-Analysis," *Medicina* 56, no. 10 (October 10, 2020): 526, <https://doi.org/10.3390/medicina56100526>.

¹²⁹ Ibid.

¹³⁰ Ibid.

¹³¹ Sule Gokyildiz Surucu et al., "The Effect of Music on Pain and Anxiety of Women during Labour on First Time Pregnancy: A Study from Turkey," *Complementary Therapies in Clinical Practice* 30 (February 2018): 96–102, <https://doi.org/10.1016/j.ctcp.2017.12.015>.

¹³² Ibid.

management methods are invasive, costly, and might have harmful effects on the mother and baby, the researchers suggest that music interventions, as a non-pharmacological method of pain management, do not necessitate medical regulations and pose no harm to both the mother and baby.¹³³ The researchers also found that the use of epidural anesthesia and narcotic agents prolong the labor duration, while music interventions positively affect the progression of labor.¹³⁴

Considering the restricted range of pharmacological interventions available for pregnant women, there exists a requirement for alternative, low-risk methods to effectively address anxiety and stress during labor and birth. Mind-body relaxation techniques are gaining popularity as more women avoid pharmacological or invasive pain management methods during labor. A study by Smith et al. determined that relaxation techniques, compared with usual care, lowered pain intensity during the latent phase of labor.¹³⁵ This study examined five relaxation techniques: relaxation, yoga, music, audio analgesia, and mindfulness.¹³⁶ As a result of this study, the researchers determined that relaxation, yoga, and music could potentially contribute to alleviating pain and enhancing contentment with pain management, although the level of supporting evidence ranges from very limited to modest.¹³⁷

As music interventions continue to gain increased attention in the literature, it is unsurprising that more and more studies are exploring how music can be used in obstetric care.

¹³³ Gokyildiz Surucu et al., “The Effect of Music on Pain and Anxiety.”

¹³⁴ Ibid.

¹³⁵ Caroline A Smith et al., “Relaxation Techniques for Pain Management in Labour,” *Cochrane Database of Systematic Reviews*, no. 3 (March 28, 2018), <https://doi.org/10.1002/14651858.cd009514.pub2>.

¹³⁶ Ibid.

¹³⁷ Ibid.

In a review that explored the use of music in obstetrics to reduce tension, pain, and stress, Wulff, Hepp, Fehm, and Schaal discovered that while much data demonstrates the benefits of music during pregnancy, including improved psychological health, sleep, psychosocial stress levels, hypertension, quality of life, and mother-infant bonding, music interventions, are rarely, if ever, employed in obstetric settings.¹³⁸ As a result of this review, the researchers stated that music is a simple, cost-efficient, and effective intervention that should be more prevalent in obstetric settings in order to allow expectant mothers an as pleasant birth experience as possible.¹³⁹ Additionally, the researchers noted that music has the potential to be considerably more utilized as an intervention by medical professionals, midwives, and expectant mothers.¹⁴⁰ It seems to offer an entirely beneficial approach for enhancing the overall enjoyment of pregnancy and childbirth.¹⁴¹

Pregnancy brings about many bodily and mental changes that call for alternative methods of pharmacological management. Music therapy is a highlighted effective, non-pharmacological pain relief measure that positively impacts prenatal and postpartum mental health, alleviates anxiety and depression symptoms, and leads to better pregnancy, labor, and birth outcomes for both mothers and their children. Despite these findings, music interventions remain underutilized in obstetric care. Therefore, to further improve women's pregnancy, labor, and birth experiences, it is proposed that music interventions should be incorporated into obstetric settings.

¹³⁸ Verena Wulff et al., "Music in Obstetrics: An Intervention Option to Reduce Tension, Pain and Stress," *Geburtshilfe Und Frauenheilkunde* 77, no. 09 (September 2017): 967–75, <https://doi.org/10.1055/s-0043-118414>.

¹³⁹ Ibid.

¹⁴⁰ Ibid.

¹⁴¹ Ibid.

Improving Prenatal and Postpartum Healthcare Practices with Music Interventions

Childbirth holds significant importance in a woman's life, and adverse birthing encounters have been demonstrated to detrimentally affect maternal health during the postpartum period.¹⁴² The objective of a study by Simavli et al. was to assess the impact of music therapy on factors such as postpartum pain, anxiety levels, satisfaction, and the incidence of early postpartum depression.¹⁴³ The study's results determined that mothers who participated in the music therapy group exhibited lower levels of postpartum pain and anxiety than the control group.¹⁴⁴ This difference was statistically significant across all observed time intervals (1, 4, 8, 16, and 24 hours, $p < 0.001$).¹⁴⁵ The utilization of music therapy during labor led to a decrease in postpartum anxiety and pain, an increase in satisfaction with the childbirth experience, and a reduction in the rate of early postpartum depression.¹⁴⁶ Considering these outcomes, music therapy presents itself as a clinically viable alternative – a safe, simple, and enjoyable non-pharmacological approach to promote postpartum well-being.¹⁴⁷

Many women elect to have an epidural during labor to help offset labor pain. While this form of analgesia provides a numbing effect from the patient's navel to the upper legs, some women still experience pain. Additionally, epidural labor can affect the mother's childbirth

¹⁴² Serap Simavli et al., "Effect of Music Therapy during Vaginal Delivery on Postpartum Pain Relief and Mental Health," *Journal of Affective Disorders* 156 (March 2014): 194–99, <https://doi.org/10.1016/j.jad.2013.12.027>.

¹⁴³ Ibid.

¹⁴⁴ Ibid.

¹⁴⁵ Ibid.

¹⁴⁶ Ibid.

¹⁴⁷ Ibid.

experience and self-esteem.¹⁴⁸ To assess the effects of music therapy on labor pain, childbirth experience, and self-esteem among first-time mothers undergoing epidural labor analgesia, An et al. recruited one hundred and thirty-six primiparous women over thirty-seven weeks gestation and separated them into a music group, where participants listened to classical music during labor, and a control group, where participants received only standard care.¹⁴⁹ As a result of this study, the researchers determined that mothers participating in the music therapy group exhibited reduced levels of latent pain ($t=1.95$, $p=.005$), active pain ($t=3.69$, $p<.001$), and transition-phase pain ($t=7.07$, $p<.001$) in comparison to the control group.¹⁵⁰ A significant difference emerged between the two groups, with the music therapy group demonstrating notably more positive perceptions of the childbirth experience ($t=-1.36$, $p=.018$).¹⁵¹ Regarding self-esteem, the experimental group displayed a slightly elevated score, although this disparity was not statistically significant compared to the control group.¹⁵² The researchers concluded that music therapy during labor decreased labor pain and improved mothers' childbirth experiences.¹⁵³ Furthermore, music therapy is a clinically advisable, non-pharmacological, safe, and uncomplicated approach for enhancing nursing care during labor.¹⁵⁴

¹⁴⁸ Sookee An et al., "The Effects of Music Therapy on Labor Pain, Childbirth Experience, and Self-Esteem during Epidural Labor Analgesia in Primiparas: A Non-Randomized Experimental Study," *Korean Journal of Women Health Nursing* 29, no. 2 (June 30, 2023): 137–45, <https://doi.org/10.4069/kjwhn.2023.06.21>.

¹⁴⁹ An et al., "The Effects of Music Therapy on Labor Pain."

¹⁵⁰ Ibid.

¹⁵¹ Ibid.

¹⁵² Ibid.

¹⁵³ Ibid.

¹⁵⁴ Ibid.

While many women desire a vaginal birth with minimal interventions for the health and safety of both the mother and baby, cesarean sections are becoming increasingly common as medical interventions interfere with the normal, physiologic birth process. As with any surgery, postoperative pain management is crucial for ensuring patient comfort, but it is especially important to recognize the potential side effects of analgesia and pharmaceuticals and how they might affect mother-infant bonding, breastfeeding, and recovery. In this study, Al Wattar and Keay explored the effectiveness of music therapy in managing postoperative pain.¹⁵⁵ The researchers analyzed current literature and determined that substantial evidence suggests music's positive, albeit moderate, impact on diminishing postoperative pain and anxiety.¹⁵⁶ The authors concluded that care provision could be optimized using music therapy and that the prospect of modernizing and revolutionizing care delivery environments appears more achievable and low-cost.¹⁵⁷

Episiotomies are a common, yet often unnecessary, obstetric procedure performed during vaginal delivery. Common side effects of episiotomies include pain and edema in the episiotomy area that causes discomfort and may interfere with breastfeeding, slower resumption of sexual function, and troubles with defecation and urination.¹⁵⁸ To assess the efficacy of music therapy on immediate postpartum episiotomy pain, Chaichanalap et al. employed one hundred

¹⁵⁵ BH Al Wattar and SD Keay, "Music Therapy to Optimise Postoperative Pain Management: How Much More Evidence Is Needed?," *BJOG: An International Journal of Obstetrics & Gynaecology* 127, no. 6 (March 3, 2020): 746–46, <https://doi.org/10.1111/1471-0528.16166>.

¹⁵⁶ Ibid.

¹⁵⁷ Ibid.

¹⁵⁸ Ravita Chaichanalap et al., "Efficacy of Music Therapy on Immediate Postpartum Episiotomy Pain: A Randomized Controlled Trial," *Thai Journal of Obstetrics and Gynaecology* 26, no. 3 (September 30, 2018): 158–65, <https://doi.org/10.14456/tjog.2018.19>.

participants to partake in a study where participants in the music group received a music therapy session after an episiotomy.¹⁵⁹ The study determined that the median Visual analog scale (VAS) was statistically significantly lower in the music therapy group than in the control group at two and six hours after completing the episiotomy wound-repairing process.¹⁶⁰ The researchers concluded that music therapy effectively reduced the perceived immediate pain of an episiotomy and should be employed in obstetric settings to improve patient well-being and experience.¹⁶¹

While pregnancy and birth are already stressful experiences for expectant mothers, some women experience more advanced stress levels due to high-risk pregnancies and extended hospital bed rest.¹⁶² To explore how music therapy affects distress levels of hospitalized women, a study that employed eighty pregnant women who were admitted to the hospital due to a range of high-risk obstetric conditions such as preterm labor, premature rupture of membranes, preeclampsia, and multiple gestations, was conducted by Wesa, Cassileth, and Victorson.¹⁶³ Using a randomized, single-blind, controlled trial, the researchers discovered a significant reduction in antepartum bed rest emotional impact inventory scores immediately following a music therapy intervention.¹⁶⁴ This study also explored recreation therapy as an alternative intervention, but this intervention was not as effective as the music intervention.¹⁶⁵ This research

¹⁵⁹ Chaichanalap et al., “Efficacy of Music Therapy.”

¹⁶⁰ Ibid.

¹⁶¹ Ibid.

¹⁶² K Wesa, B Cassileth, and D Victorson, “Music Therapy Dramatically Decreases Distress for Women Hospitalised in a High-Risk Obstetrics/Gynaecology Setting,” *Focus on Alternative and Complementary Therapies* 15, no. 4 (November 25, 2010): 297–99, https://doi.org/10.1111/j.2042-7166.2010.01057_6.x.

¹⁶³ Ibid.

¹⁶⁴ Ibid.

¹⁶⁵ Ibid.

revealed that music interventions exhibited initial acceptability and effectiveness in reducing distress associated with the antepartum period within this group.¹⁶⁶ Recognizing that individuals with high distress levels might have declined or discontinued participation, the researchers suggested that these interventions seem most suitable for expectant mothers experiencing mild to moderate distress.¹⁶⁷

While the literature thus far has demonstrated the benefits of music as a sole intervention, Perkovic et al. explored the relationship between the education of expectant mothers and listening to classical music with the experience of pain during labor and birth and the occurrence of psychological symptoms postpartum.¹⁶⁸ Using a prospective randomized controlled trial, the pregnant women in the experimental category received educational guidance throughout pregnancy and engaged in listening to classical music for the duration of their pregnancy.¹⁶⁹ In contrast, the control group received standard care practices.¹⁷⁰ The VAS was employed to evaluate pain levels.¹⁷¹ The study's results determined a significant difference in pain assessment between the experimental and control groups, who rated their childbirth experience as moderate and severe, respectively.¹⁷² This study demonstrated the strong impact of prenatal education and

¹⁶⁶ Wesa, Cassileth, and Victorson, "Music Therapy Dramatically Decreases Distress."

¹⁶⁷ Ibid.

¹⁶⁸ Roberta Perković et al., "Relationship between Education of Pregnant Women and Listening to Classical Music with the Experience of Pain in Childbirth and the Occurrence of Psychological Symptoms in Puerperium," *Psychiatria Danubina* 33, no. 13 (December 1, 2021): 260–70, <https://web.s.ebscohost.com/ehost/pdfviewer/pdfviewer?vid=0&sid=f4cc71fd-612e-4774-ae49-2f8bf99d3e3e%40redis>.

¹⁶⁹ Ibid.

¹⁷⁰ Ibid.

¹⁷¹ Ibid.

¹⁷² Ibid.

listening to classical music on the perception of pain during labor and birth and mental health postpartum, which suggests that prenatal education and music interventions, when used together, can improve maternal prenatal and postpartum experiences.¹⁷³

Complementary interventions continue to gain popularity in obstetric care.¹⁷⁴ In a study that explored the influence of music therapy combined with unrestricted positional delivery on labor pain and birth results, Guo et al. discovered that combining music therapy and free positional delivery resulted in a reduced need for medical interventions during the birthing process.¹⁷⁵ Additionally, the researchers discovered that integrating music therapy and free positional delivery effectively diminished maternal labor pain, decreased the risk of postpartum hemorrhage and birth canal injury, and minimized medical interventions during labor.¹⁷⁶ This intervention can be considered a secure method to support childbirth and improve labor and birth outcomes.¹⁷⁷

The combination of music as medicine and pharmacological methods are beneficial not only for mothers but also for newborn babies. In a study by Kurdahi Badr et al., the researchers conducted a random exposure experiment involving 42 preterm infants whose average gestational age was 31.8 ± 2.79 weeks.¹⁷⁸ The infants were exposed to three different auditory

¹⁷³ Perković et al., “Relationship between Education of Pregnant Women.”

¹⁷⁴ Huimin Guo et al., “Effect of Music Therapy Combined with Free Position Delivery on Labor Pain and Birth Outcomes,” ed. Fahd Abd Algalil, *Applied Bionics and Biomechanics* 2022 (May 11, 2022): 1–6, <https://doi.org/10.1155/2022/8963656>.

¹⁷⁵ Ibid.

¹⁷⁶ Ibid.

¹⁷⁷ Ibid.

¹⁷⁸ Lina Kurdahi Badr et al., “Preterm Infants Exhibited Less Pain during a Heel Stick When They Were Played the Same Music Their Mothers Listened to during Pregnancy,” *Acta Paediatrica* 106, no. 3 (December 13, 2016): 438–45, <https://doi.org/10.1111/apa.13666>.

stimuli: the music their mothers had listened to during pregnancy, recorded lullabies, and no music.¹⁷⁹ These stimuli were presented before, during, and after a heel stick procedure, and pain responses were evaluated using the Neonatal Pain, Agitation, and Sedation Scale (N-PASS) while a nurse, unaware of the intervention, recorded physiological and behavioral reactions.¹⁸⁰ As a result of this study, the researchers found that N-PASS scores were lowest when infants listened to the music their mothers had listened to during pregnancy, compared with recorded lullabies and no music. In conclusion, the researchers determined that infants exhibit decreased pain and improved behavioral states when exposed to familiar music during a heel stick.¹⁸¹

Childbirth is a pivotal moment in a woman's life, and many studies have showcased the benefits of music interventions across various aspects of obstetric care. From reducing postpartum pain and anxiety levels and enhancing overall birth and labor satisfaction to reducing the risk of early postpartum depression, music interventions are a great way to improve prenatal and postpartum care practices. Collectively, these studies highlighted music therapy and music interventions as valuable and versatile alternative interventions in obstetric care that contributed to improved maternal well-being, pain management, and overall obstetric experiences. While some of the final studies do not specifically address this study's research questions, they offer valuable insights and complementary perspectives related to this research area, enhancing the overall understanding of the topic. While not directly addressing the primary research question, they provide a broader context and potential connections that enrich the quality and depth of this study.

¹⁷⁹ Kurdahi Badr et al., "Preterm Infants Exhibited Less Pain."

¹⁸⁰ Ibid.

¹⁸¹ Ibid.

Conclusion

This comprehensive literature review has delved into the intricate interplay between maternal stress and its implications across various maternal-fetal health and well-being domains. The multifaceted effects on maternal-fetal outcomes, fetal development, maternal-fetal bonding, labor, delivery, and postpartum experiences underscore the need for innovative interventions. Music therapy emerges as a promising avenue, offering a holistic approach to managing stress, anxiety, and depression during pregnancy and postpartum. Its potential as an alternative to pharmaceutical interventions highlights its versatility and safety. By incorporating music interventions into prenatal and postpartum care, healthcare practices benefit from improved maternal-fetal bonding, reduced stress-related complications, enhanced emotional well-being, and, ultimately, a more positive childbirth experience. This synthesis underscores the significance of embracing non-pharmacological interventions like music therapy within healthcare practices, paving the way for an enhanced standard of care that addresses the diverse needs of expectant and new mothers.

In modern obstetric care, where medical interventions are common, and stress levels among expectant and postpartum mothers are a growing concern, this study holds great promise for addressing these challenges. While much literature demonstrates the multitude of benefits of music education during pregnancy and postpartum, for both the mother and her child, there is not currently an accessible prenatal or postpartum music program available to mothers who are seeking a non-pharmacological alternative form of treatment for the common challenges faced during pregnancy, labor, birth, and postpartum. The concept of offering music classes as an alternative care option during pregnancy aligns with the increasing interest in alternative interventions and fills a crucial gap in providing holistic support for pregnant and postpartum

mothers. By nurturing a positive and supportive environment through music, this research study has the potential to counteract the current medicalized approach to obstetric care and contribute to improved mother and child outcomes by improving pregnancy and birth experiences. As this study delves into the potential of music to bridge this gap in alternative care, it holds the potential to revolutionize how the world approaches pregnancy and postpartum care.

Chapter Three: Methodology

Introduction

The purpose of this qualitative hermeneutic phenomenological study was to examine how music interventions influence stress levels during pregnancy and how musical interventions can be implemented to positively affect women's pregnancy experiences. Chapter Three provides a detailed description of the research design, research questions and hypotheses, and more information about the research participants and the selection process. In addition, it addresses the research participants and setting, researcher positionality, procedures implemented during the study, and the data collection plan. Finally, it concludes with the credibility, transferability, dependability, confirmability, authenticity, and ethical considerations of the study, followed by a summary.

Research Design

Stress, anxiety, and depression are sensitive conditions that many women experience during pregnancy. The influence of music interventions on these conditions can be best explored through qualitative research questions that address the "how" and "why" to enable "a deeper understanding of experiences, phenomena, and context."¹⁸² A qualitative approach was selected for this study because of the way it lends a humanistic and more caring approach to research. Furthermore, "qualitative research allows you to ask questions that cannot be easily put into numbers to understand human experience."¹⁸³

¹⁸² Jennifer Anne Cleland, "The Qualitative Orientation in Medical Education Research," *Korean Journal of Medical Education* 29, no. 2 (May 29, 2017): 61–71, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5465434/>.

¹⁸³ Ibid.

More specifically, this research study applies a hermeneutic phenomenology approach. This approach “has been widely used by researchers to understand lived experiences.”¹⁸⁴ Prenatal and postpartum stress, anxiety, and depression are not universal conditions and are experienced differently by each woman. A hermeneutic phenomenological study “asserts that individual people are as unique as their life stories” and values the individual’s perspective and personal experiences.¹⁸⁵ Hermeneutic phenomenological studies “are powerful for understanding subjective experience, gaining insights into people’s motivations and actions, and cutting through the clutter of taken-for-granted assumptions and conventional wisdom.”¹⁸⁶ A phenomenological approach is often implemented in medical education and music therapy research, making it an ideal approach for this study that combines women’s health and music education.¹⁸⁷

Research Questions

This study seeks to address the central research question:

How do music interventions affect stress levels during pregnancy? Additional sub-questions include:

How can practitioners implement music interventions as a holistic approach to stress management during pregnancy?

How do music interventions affect pregnancy outcomes?

¹⁸⁴ Maureen Miles et al., “Hermeneutic Phenomenology: A Methodology of Choice for Midwives,” *International Journal of Nursing Practice* 19, no.4 (May 13, 2013): 409-414.

¹⁸⁵ Ibid.

¹⁸⁶ Jennifer Anne Cleland, “The Qualitative Orientation.

¹⁸⁷ Ibid.

Hypotheses

Based on current literature, it is hypothesized that music interventions will positively affect stress levels during pregnancy. One study in particular that explored if listening to music during pregnancy could be protective against postnatal depression and poor well-being postnatally determined that “listening during pregnancy is associated with higher levels of well-being and reduced symptoms of postnatal depression in the first 3 months post birth.”¹⁸⁸ It is hypothesized that this research study will provide additional insight into women’s experiences with stress, anxiety, and depression during pregnancy and how music can be best used to support them constantly throughout pregnancy.

The data obtained through in-person group sessions and qualitative surveys will likely demonstrate the lack of availability of music interventions for pregnant women and will further highlight the need to create a program that practitioners can use to implement a holistic approach to stress management during pregnancy. Rather than turning to pharmacological approaches, research suggests that “music therapy is a simple, non-pharmacological and safe method that significantly contributes to mental health in pregnancy and after childbirth. The application of music therapy has a scientific potential that offers many ideas for the development of medical–music research.”¹⁸⁹ A universal program that is easily accessible through maternal care institutions is not currently available to pregnant women but should be made available if this hypothesis is accepted.

¹⁸⁸ Daisy Fancourt and Rosie Perkins, “Could Listening to Music during Pregnancy Be Protective against Postnatal Depression and Poor Wellbeing Post Birth? Longitudinal Associations from a Preliminary Prospective Cohort Study,” *BMJ Open* 8, no. 7 (July 1, 2018): e021251, <https://bmjopen.bmj.com/content/8/7/e021251>.

¹⁸⁹ Roberta Perkovic et al., “Music Therapy and Mental Health in Pregnancy,” *Psychiatria Danubina* 33, no. 4 (2021): 786–789, accessed December 11, 2022, <https://pubmed.ncbi.nlm.nih.gov/34718319/>.

Based on previous research studies, it is hypothesized that music interventions will positively influence pregnancy outcomes. Current literature demonstrates that “prenatal stress can have significant effects on pregnancy, maternal health, and human development.”¹⁹⁰ The effects of stress “may occur directly through the influence of prenatal stress-related physiological changes on the developing fetus, or indirectly through the effects of prenatal stress on maternal health and pregnancy outcome which, in turn, affect infant health and development.”¹⁹¹ If music can be used during pregnancy to lower stress levels, it is hypothesized that pregnancy outcomes would improve.

Participants and Setting

This section identifies the study’s population, participants, groups, and setting, including demographics and participant characteristics. The study population is over eighteen years of age and may be first-time mothers (primiparous) or mothers who have already given birth before (multiparous). The population comprises biological women who are sixteen to thirty weeks pregnant.

Participants

Using convenience sampling, primiparous and multiparous biological women in the Georgetown, Ontario, area who self-identified as experiencing stress, anxiety, or depression during pregnancy were recruited to volunteer to participate in a two-week music program study. Purposive sampling was also conducted to gain detailed knowledge of a very small, specific population. Therefore, only biological women who were pregnant, who self-identified as

¹⁹⁰ Mary E Coussons-Read, “Effects of Prenatal Stress on Pregnancy and Human Development: Mechanisms and Pathways,” *Obstetric Medicine* 6, no. 2 (June 2013): 52–57, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5052760/>.

¹⁹¹ Ibid.

experiencing stress, anxiety, or depression, and who were sixteen to thirty weeks pregnant were approved by the researcher to be included in this study. There were ten participants in this study, which is sufficient for Creswell's suggestion of between ten and fifty participants to reach data saturation sufficiently.¹⁹²

Setting

This study occurred at a private, commercial studio space in Georgetown, Ontario, where pregnant mothers gathered in person for weekly music sessions. The researcher provided all materials, including instruments, and music. Participants were only asked to bring a yoga mat or blanket for floor work at the studio space.

Researcher Positionality

My motivation for this study is grounded in my love of music and its powerful benefits, my desire to serve women through pregnancy, and my deep appreciation for natural alternatives to pharmacological medicine. In the current environment of prenatal healthcare, pregnant women are not receiving the care and attention they deserve. From speaking with other birth workers, women's health practitioners, and mothers, I have realized the level of brokenness of the modern medical system. Unfortunately, many women's pregnancy experiences have become so medicalized. What should be a positive and beautiful experience for women has become a scary, medicalized process that exacerbates women's stress and anxiety levels. The primary goal of this study is to determine how music can be used for stress management in order to be able to offer women a natural, cost-effective, holistic alternative to stress management during pregnancy

¹⁹² John W Creswell and Cheryl N Poth, *Qualitative Inquiry & Research Design: Choosing among Five Approaches*, 4th ed. (Los Angeles: Sage, 2018).

through God's gift of music. In today's medical culture, most women do not have access to compassionate care during this stressful time, and if they do, it is often unaffordable. There is much literature demonstrating the benefits of music for stress management in other clinical settings, but no research shows how music can be explicitly applied for continuous stress management during pregnancy. This research study is designed to bring awareness to the power of music for stress management during pregnancy so that more practitioners, doctors, and professionals in this field will come to recognize and implement music as a beneficial treatment for their clients and patients during pregnancy.

Interpretive Framework

In qualitative research, "philosophical assumptions are often applied within interpretive frameworks that qualitative researchers use when they conduct a study."¹⁹³ Defined as "paradigms, or beliefs that the researcher brings to the process of research" or "theories or theoretical orientations that guide the practice of research," it is necessary to establish the interpretive framework of the study before introducing philosophical assumptions.

This study was conducted using a transformative framework approach, which seeks to identify issues of marginalized groups. "As these issues are studied and exposed, the researchers provide a voice for these participants, raising their consciousness and improving their lives."¹⁹⁴ One of the main issues identified in this study is the lack of support pregnant mothers receive for stress, anxiety, and depression management during pregnancy. For women who do receive help during these stressful times, medicalized care is often the only option they are given when there

¹⁹³ John W Creswell and Cheryl N Poth, *Qualitative Inquiry & Research Design: Choosing among Five Approaches*, 4th ed. (Los Angeles: SAGE Publications, 2017), 22.

¹⁹⁴ *Ibid.*, 25.

are many alternative and more successful options that should be offered, including music interventions. This study seeks to change practice in current obstetrical care by demonstrating how music interventions during pregnancy can support stress, anxiety, and depression management for pregnant mothers. Using qualitative questionnaires, participants in this study will have the opportunity for their perspectives to be “heard throughout the research process,” which makes it beneficial for all involved.¹⁹⁵

Philosophical Assumptions

Philosophy is important in research, as “it shapes how we formulate our problem and research questions and how we seek information to answer the questions.”¹⁹⁶ Additionally, philosophical assumptions are “deeply rooted in our training and reinforced by the scholarly community in which we work,” so it would be unwise to ignore how these assumptions may influence this phenomenological study.¹⁹⁷ Relating “to the nature of reality and its characteristics,” this study assumed the ontological perspective that reality is multiple as experienced through many views.¹⁹⁸ As a result of this perspective, the study investigated the participant’s unique perspectives on how music can be utilized for stress management during pregnancy in their everyday lives. This study also assumed an epistemological perspective, where “subjective evidence is obtained from participants; the researcher attempts to lessen the distance between himself or herself and that being researched.”¹⁹⁹ Through weekly, in-person

¹⁹⁵ Creswell and Poth, *Qualitative Inquiry & Research Design*, 25.

¹⁹⁶ Eva Ponte, *A Framework for Understanding Assumptions*, 2014, <https://programs.coe.hawaii.edu/medt/edcs632/wp-content/uploads/sites/5/2014/04/creswell-ch-2.pdf>.

¹⁹⁷ Ibid.

¹⁹⁸ Creswell and Poth, *Qualitative Inquiry & Research Design*, 20.

¹⁹⁹ Ibid.

music intervention sessions, I was able to spend quality time with the participants and gain knowledge and evidence through my own active participation in leading the sessions.

Additionally, participants' personal experiences were shared through journal entries. Finally, "the axiological assumption that characterizes qualitative research" is that this study was influenced by my personal values, which shaped the study's narrative. I admit that the stories expressed in this study are influenced by my social position, personal experiences, and political and professional beliefs and that these stories "represent an interpretation of the author as much as the subject of the study."²⁰⁰ This study, therefore, includes a combination of my "interpretation in conjunction with those of the participants."²⁰¹

Researcher's Role

Qualitative research studies are unique in how they employ the researcher as a human instrument of data collection. "Because the researcher is the instrument in semi-structured or unstructured qualitative interviews, unique researcher attributes have the potential to influence the collection of empirical materials."²⁰² Qualitative research is distinctive from other research methods in how researchers interact with their participants, "after all, it is through the researcher's facilitative interaction that a conversational space is created where respondents share rich information about their lives."²⁰³ Pezalla, Pettigrew, and Miller-Day note that

²⁰⁰ Creswell and Poth, *Qualitative Inquiry & Research Design*, 21.

²⁰¹ Ibid.

²⁰² Anne E Pezalla, Jonathan Pettigrew, and Michelle Miller-Day, "Researching the Researcher-As-Instrument: An Exercise in Interviewer Self-Reflexivity," *Qualitative Research: QR* 12, no. 2 (2012): 165–185, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4539962/>.

²⁰³ Pezalla, Pettigrew, and Miller-Day, "Researching the Researcher-As-Instrument."

“qualitative researchers are *differently calibrated instruments*,” so it is understandable that my personal characteristics, beliefs, and practices will uniquely affect this study.

I am the founder of The Main Conservatory of Music Inc., a boutique music school, and Divine Design Collective Inc., a women’s natural health practice, both located in Georgetown, Ontario. While participants may know of me from my public role at these two businesses, all participants volunteered to partake in this research study.

My role at the research site of this study involved leading the group music sessions and teaching participants how to use music at home to help with stress management.

As an early childhood music specialist with a specialization in music therapy, certified Women’s Holistic Hormone Health Practitioner, and certified Childbirth Educator and Doula, I conducted this study believing in the power of music and natural alternatives to pharmacological approaches. Rather than aspiring to the “unachievable goal of objectivity, it is better to simply be honest and transparent about one’s own subjectivities, allowing readers to draw their own conclusions about the interpretations that are presented through the research itself.”²⁰⁴ While I assume that music is a beneficial tool for stress management during pregnancy, this study aims to focus on the participants’ experiences with music and to enable the participants’ perspectives to be included.

²⁰⁴ Zubin Austin and Jane Sutton, “Qualitative Research: Getting Started,” *The Canadian Journal of Hospital Pharmacy* 67, no. 6 (December 22, 2014): 436, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4275140/>.

Procedures

The following paragraph will detail the required permissions for the study, the participant recruitment process, and the data collection plan. This study began with an analysis of existing literature. The existing literature guided the development of the entrance and exit questionnaires and interviews and the development of the activities, exercises, and music implemented in the two-week music classes.

Permissions

Upon receiving and reviewing the submitted request letters, recruitment materials, consent materials, and instruments, approval was confirmed by Liberty University's Institutional Review Board (Appendix A). After reading either an Instagram or Facebook post (see Appendix B) that described the methods and requirements of this study, primiparous and multiparous biological women who self-identified as experiencing stress, anxiety, or potential participants contacted the researcher, asserting their interest to participate in the advertised study. These social media posts were a form of passive online recruitment, which involved placing an advertisement in an online group "with the aim of attracting potential participants to contact the research team for more information and consideration of enrollment."²⁰⁵ As the researcher confirmed the participants met the requirements listed in the recruitment post to participate in the study, participants were sent a digital consent and debriefing form via Jotform. For more information regarding the IRB approval for this study, please contact Liberty University's IRB Department (approval IRB-FY23-24-1256).

²⁰⁵ Luke Gelinas et al., "Using Social Media as a Research Recruitment Tool: Ethical Issues and Recommendations," *The American Journal of Bioethics* 17, no. 3 (February 16, 2017): 3-14, <https://doi.org/10.1080/15265161.2016.1276644>

Participant Recruitment Plan

Upon receiving participant interest, the researcher confirmed that each participant met the requirements to participate in the study and confirmed her consent to participate in the study using a digital consent and debriefing form. Recruitment for the study was conducted virtually using Facebook and Instagram.

Data Collection Plan

For all study participants, the researcher offered an evidence-based two-week stress management music class to women in the Georgetown, Ontario, area. Before classes began, the study participants completed a qualitative, open-ended entrance questionnaire using Jotform, so that the researcher could obtain a baseline of each woman's stress levels. This questionnaire included open-ended questions, which allowed the participants to "describe their problems in their own words."²⁰⁶ These questionnaires were completed two weeks before the sessions began to give the researcher sufficient time to collate and organize the questionnaire data. The questions included in the questionnaire are as follows

1. What is/are your biggest challenge(s) in your pregnancy journey?
2. How do the challenge(s) identified above cause additional stress or feelings of anxiety/depression?
3. What coping techniques are you currently using to deal with feelings of stress, anxiety, and depression?

²⁰⁶ Tetsuya Abe et al., "Tailored Opening Questions to the Context of Using Medical Questionnaires: Qualitative Analysis in First-Visit Consultations," *Journal of General and Family Medicine* 24, no. 2 (December 14, 2022), <https://doi.org/10.1002/jgf2.593>.

4. What suggestions have your doctor or midwife suggested to help you cope with stress, anxiety, and depression?

During the two-week music classes, the study participants learned stress-reducing techniques through music and were given a specific music protocol to use daily at home. In the in-person music classes, participants learned breathing techniques while listening to acoustic music and lullabies to access throughout pregnancy, how different styles and tempos of music can be applied to improve mood, and how to implement these procedures at home during pregnancy and beyond.

The at-home music protocol entailed fifteen minutes of prescribed music listening via a Spotify playlist, followed by a guided music journal reflection. To collect data on the participants' experiences with the at-home protocol, they were given a link to a digital journal to access throughout the study and were asked to maintain a daily journal of their experiences with the at-home music intervention. "Solicited journal entries are a qualitative research method with a fairly strong tradition in sociological research and particularly in qualitative health research."²⁰⁷ This data collection method was well suited for this study, as this study investigated human behavior concerning the health crises of stress, anxiety, and depression during pregnancy.

After the two-week session, the participants completed an exit questionnaire so that the researcher could assess and compare their stress levels after participating in the two-week music sessions. The questions included on the exit questionnaire are as follows:

²⁰⁷ Sarah Rudrum et al., "Qualitative Research Studies Online: Using Prompted Weekly Journal Entries during the COVID-19 Pandemic," *International Journal of Qualitative Methods* 21 (January 2022): <https://doi.org/10.1177/16094969221093138>.

1. Did the music treatments help you deal with the challenge(s) you face in your pregnancy journey? If yes, please explain how. If no, please explain why not.
2. What musical coping techniques best help you manage stress, anxiety, and depression?
3. Do you think that music is beneficial during pregnancy? If yes, please explain how. If no, please explain why not.
4. Will you continue to use music as a form of stress management during pregnancy? If yes, which techniques will you employ?

Once the data were collected, transcribed, and organized, participants' symptoms, experiences, journal entries, and surveys were coded and analyzed using the Delve analysis tool to identify themes that address the central research question and sub-questions.

Data Analysis

This study employed six phases of qualitative data analysis and thematic analysis: familiarising with data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report.²⁰⁸ The data used in these phases were collected from the study's questionnaires and journal entries. This process allowed the researcher to reduce "large amounts of empirical material and make the data readily accessible for analysis, while at the same time increasing the quality of the analysis and findings."²⁰⁹

²⁰⁸ Mojtaba Vaismoradi, Hannele Turunen, and Terese Bondas, "Content Analysis and Thematic Analysis: Implications for Conducting a Qualitative Descriptive Study," *Nursing & Health Sciences* 15, no. 3 (March 11, 2013): 398–405, <https://onlinelibrary.wiley.com/doi/full/10.1111/nhs.12048>.

²⁰⁹ Mai Skjott Linneberg and Steffen Korsgaard, "Coding Qualitative Data: A Synthesis Guiding the Novice," *Qualitative Research Journal* 19, no. 3 (May 8, 2019): 259–70, <https://doi.org/10.1108/QRJ-12-2018-0012>.

Following the review and familiarization of the data, the researcher began to generate initial codes by “coding interesting features of the data systematically across the entire data set” and “collating data relevant to each code.”²¹⁰ A qualitative research codebook was established, which included a code definition for each code and examples of what to include with each code.²¹¹ The codebook was a useful organization tool that helped further organize codes into categories and subcodes. Additionally, the code book provided an apparent reference for the “researcher to go back and re-code previously coded material to make certain that data examined early in the analysis is coded in the same manner and with the same coding definitions/criteria as data addressed later in the analysis.”²¹² The codebook was consistently referenced throughout the data analysis process and subsequent coding rounds. Following the first thematic coding cycle, a second coding cycle was conducted, which allowed the researcher to “connect codes, sub-codes, thematic links, and finally, theory.”²¹³

Following the analysis of codes and subcodes, potential themes were reviewed, and the researcher checked “if the themes work in relation to the coded extracts and the entire data set.”²¹⁴ Throughout this process, the researcher conducted an ongoing analysis that refined “the specifics of each theme and the overall story that the analysis tells, generating clear definitions and names for each theme.”²¹⁵ Finally, clear definitions and names for each theme were

²¹⁰ Vaismoradi, Turunen, and Bondas, “Content Analysis.”

²¹¹ “How to Create a Qualitative Codebook,” Delve, n.d., <https://delvetool.com/blog/codebook>.

²¹² Ashley Castleberry and Amanda Nolen, “Thematic Analysis of Qualitative Research Data: Is It as Easy as It Sounds?,” *Currents in Pharmacy Teaching and Learning* 10, no. 6 (June 2018): 807–15, <https://doi.org/10.1016/j.cptl.2018.03.019>.

²¹³ Maria Lungu, “The Coding Manual for Qualitative Researchers,” *American Journal of Qualitative Research* 6, no. 1 (May 13, 2022): 232–37, <https://doi.org/10.29333/ajqr/12085>.

²¹⁴ Vaismoradi, Turunen, and Bondas, “Content Analysis.”

²¹⁵ Ibid.

established before the final report was produced.²¹⁶ This final report utilized a thematic analysis, which included the steps of compiling, disassembling, reassembling, interpreting, and concluding the data as a method of “identifying, analyzing, and reporting patterns (themes) within data.”²¹⁷ By following the steps mentioned above for thematic analysis of qualitative data, the researcher could present trustworthy and credible work.²¹⁸

Trustworthiness

The trustworthiness “of a study refers to the degree of confidence in data, interpretation, and methods used to ensure the quality of the study.”²¹⁹ While experts may debate what constitutes trustworthiness, the criteria outlined by Lincoln and Guba include *credibility, dependability, confirmability, transferability, and authenticity*.²²⁰ This section outlines the steps implemented throughout this study to meet these criteria.

Credibility

Considered the most important criterion in study trustworthiness, “techniques used to establish credibility include prolonged engagement with participants, persistent observation if appropriate to the study, peer-debriefing, member-checking, and reflective journaling. Evidence also should be presented of iterative questioning of the data, returning to examine it several

²¹⁶ Vaismoradi, Turunen, and Bondas, “Content Analysis.”

²¹⁷ Castleberry and Nolen, “Thematic Analysis.”

²¹⁸ Ibid.

²¹⁹ Lynne M. Connelly, “Trustworthiness in Qualitative Research,” *Medsurg Nursing* 25, no. 6 (2016): 435–436, accessed June 4, 2023, <https://go.openathens.net/redirector/liberty.edu?url=https://www.proquest.com/scholarly-journals/trustworthiness-qualitative-research/docview/1849700459/se-2>.

²²⁰ Ibid.

times.”²²¹ This study achieved credibility through prolonged engagement with and observation of the participants, debriefing with other practitioners in the field, and peer review.

Dependability

Referring to “the stability of the data over time and over the conditions of the study,” “procedures for dependability include maintenance of an audit trail of process logs and peer-debriefings with a colleague. Process logs are researcher notes of all activities that occur during the study and decisions about aspects of the study, such as whom to interview and what to observe.”²²² This study achieved dependability through detailed and thorough process logs and recorded and transcribed debriefings with colleagues.

Confirmability

To ensure confirmability, the neutrality or the degree findings must be consistent and should be able to be repeated by another researcher.²²³ In this study, confirmability was achieved by accessing detailed notes regarding decisions and analyses as they progressed, which were then reviewed by a colleague. “These discussions prevent biases from only one person’s perspective on the research.”²²⁴ If another researcher were to conduct the same study, the information and processes provided in this study would allow them to replicate the same study with their own study group.

²²¹ Lynne M. Connelly, “Trustworthiness in Qualitative Research.”

²²² Ibid.

²²³ Ibid.

²²⁴ Ibid.

Transferability

Transferability is “the extent to which findings are useful to persons in other settings.”²²⁵ In qualitative research, researchers must “focus on the informants’ stories without saying “this is everyone’s story.” Researchers support the study’s transferability with a rich, detailed description of the context, location, and people studied, and by being transparent about analysis and trustworthiness.”²²⁶ This study employs transferability by providing thorough evidence that informs and resonates with readers of all backgrounds.²²⁷

Authenticity

Authenticity refers to the “extent to which researchers fairly and completely show a range of different realities and realistically convey participants lives.”²²⁸ In this study, authenticity was achieved by selecting an appropriate study sample and rich, detailed descriptions of all actions and methods throughout the study.²²⁹ Additionally, this study strived to “portray fully the deep meaning of a phenomenon to increase readers’ understanding” in an unbiased, raw, and authentic way.²³⁰

Ethical Considerations

Throughout the study, ethical considerations were at the forefront of every decision made and every action executed. First, IRB approval was secured before the data collection process

²²⁵ Lynne M. Connelly, “Trustworthiness in Qualitative Research.”

²²⁶ Ibid.

²²⁷ Ibid.

²²⁸ Ibid.

²²⁹ Ibid.

²³⁰ Ibid.

began. Upon receiving IRB approval, participants were recruited and informed consent was obtained. Participant information will remain anonymous to preserve confidentiality, and participants were assigned a random pseudonym connected to their personal data. Collected data were stored on an encrypted, password-protected desktop computer with no personal identifying information available. Participants were informed of the study's outcomes at the conclusion.

Summary

The purpose of this qualitative hermeneutic phenomenological study was to examine how music interventions influence stress levels during pregnancy and how musical interventions can be implemented to positively affect pregnancy experiences. Chapter Three detailed the research design that guided this study, research questions and hypotheses, and more information about the research participants and the selection process. It also addressed the research participants and setting, researcher positionality, procedures implemented during the study, and the data collection plan. Finally, it concluded with a summary of ethical considerations and measures taken to protect participant confidentiality while also summarizing the study's credibility, transferability, dependability, confirmability, and authenticity.

Chapter Four: Research Findings

Overview

The purpose of this qualitative hermeneutic phenomenological study was to examine how music interventions impacted stress levels during pregnancy. Chapter Four begins with a description of the study participants' parity and gestation. Additionally, this section includes confirmation that participants met the requirements to participate in this study. In the second section, the themes identified by analyzing the entrance questionnaires are discussed. The third section explores themes derived from the analysis of participants' at-home music journals, and the fourth section presents the participants' responses to the exit questionnaire. Chapter Four concludes with a summary that reviews the study's research question and discusses whether the study's hypothesis was accepted or rejected.

Participants

The study was introduced to primiparous and multiparous mothers who were sixteen to thirty weeks pregnant and who self-identified as experiencing stress, anxiety, or depression during pregnancy. The ten applicants who volunteered to participate in this study and contacted the researcher using Facebook or Instagram were sent a digital consent and debriefing form via Jotform. All ten participants submitted the digital consent form and submitted the entrance questionnaire before the commencement of the in-person part of the study, as required. Pseudonyms are applied in Table 1 to describe the research participants.

Table 1*Research Participants*

Participant	Biological Sex	Gestation	Parity
Anne	Female	16 weeks	0
Flora	Female	17 weeks	3
Pat	Female	24 weeks	1
Alicia	Female	17 weeks	0
Rose	Female	27 weeks	2
Louise	Female	29 weeks	2
Marie	Female	18 weeks	0
Mel	Female	22 weeks	1
Isabelle	Female	22 weeks	1
Maddy	Female	29 weeks	0

Results

Entrance Questionnaire

The ten pregnant mothers who participated in this study all identified as experiencing stress, anxiety, or depression during pregnancy, but their most significant challenges in pregnancy and causes of stress, anxiety, and depression differ. Table 2 outlines the participants and their pregnancy challenges and stressors as identified in the entrance questionnaire.

Table 2*Pregnancy Challenges and Stressors*

Participant	Pregnancy Challenges	Stressors as Result of Challenges
Anne	Balancing work responsibilities and pregnancy symptoms. Nausea and fatigue make it hard to focus.	Trying to balance work and pregnancy makes me feel overwhelmed and anxious. I am worried about not performing well at work while also trying to take care of my physical health and the health of my baby.
Flora	Dealing with morning sickness but still have to take care of my other children.	I feel like I'm neglecting my other children when I am not feeling well. I feel down and sad because I can't do everything I used to be able to do.
Pat	Unsolicited and unwanted advice from family and friends.	I want to make my own decisions about my pregnancy and parenting choices, but family and friends make me feel pressured to follow their advice.
Alicia	Financial worries and the expenses associated with preparing for the baby.	I want what's best for my baby but I worry about how I am going to be able to afford it. These thoughts make me feel anxious and stressed.
Rose	Finding time to rest and look after my health. I work long hours on my feet and find pregnancy symptoms hard to manage.	I feel stressed because I'm exhausted. I worry about how my work is impacting my health and my baby's health.
Louise	Managing physical discomforts (I have back pain). Frequent trips to the bathroom make it hard to focus on my work.	The pressure to perform at work and all the physical discomforts make me feel stressed and overwhelmed.
Marie	Feeling alone and unsupported.	Feeling alone adds to my stress and makes me worried about the future and how I will handle being a single mom.
Mel	I struggle with how my body is changing and feel insecure about how I look.	It's hard to accept my changing body and I worry about what others think of me.
Isabelle	Managing work schedules and keeping up with my own health.	My unpredictable and constantly changing work schedules make me feel stressed. I sometimes have to cancel my prenatal appointments because of my work schedule. I don't always have time to get enough rest.
Maddy	Dealing with mood swings and emotional changes.	I feel out of control, like I can't manage how I feel. I'm scared this is negatively impacting my relationships with family and friends.

After discussing pregnancy challenges and how these challenges create feelings of stress, anxiety, and depression, participants were asked to discuss the coping techniques they currently use to deal with their feelings of stress, anxiety, and depression, as well as the suggestions their doctor or midwife has made to help with coping. Table 3 outlines participants' coping techniques and suggested coping techniques as identified in the entrance questionnaire.

Table 3

Coping Techniques

Participant	Coping Techniques	Suggested Coping Techniques
Anne	I take short breaks when I am at work. I practice deep breathing exercises. I go for prenatal massages.	Get more rest, drink more water, delegate tasks at work when possible. Prenatal yoga class to help with relaxation.
Flora	I rest when the kids nap. I ask my husband for help. I eat small meals throughout the day to help with my morning sickness.	Eat crackers before getting out of bed, ginger tea. Ask my older children to help with simple household chores.
Pat	I try to listen but still do what I think is right for me and my baby. I also talk to supportive friends and family members who understand and support my choices.	Trust my intuition and ignore unsolicited advice. Join a support group for first-time moms.
Alicia	I started budgeting and look for deals on baby items. I am focusing on just buying the essentials and try to avoid looking at fancy, unnecessary baby gear	Looking into assistance programs, creating a baby registry and hosting a baby shower, continuing to budget and focus on priorities.
Rose	I sit down at work whenever I can. I take short breaks at work when possible.	Talking to my employer about possible workplace accommodations.
Louise	I take short walks during my breaks at work to ease my back pain and to help clear my mind.	Regular prenatal exercise. Regular breaks at work.
Marie	I attend a free, local parenting class. I am part of a couple online single mom groups.	Seek counselling if I am feeling overwhelmed and need additional support.

Participant	Coping Techniques	Suggested Coping Techniques
Mel	I practice positive self-talk and use a gratitude journal.	Prenatal yoga class to help with body acceptance and relaxation.
Isabelle	I try to write down my scheduled appointments in advance and let my supervisor know that these appointments are important and I cannot change them. I've started standing up for myself and the needs of my baby, I find this helps me to feel less stressed and anxious.	Talk to HR about schedule adjustments. Practice relaxation exercises during my breaks on busy shifts.
Maddy	I'm working on better communication with my friends and family. I try to take time for myself, I think this helps me to recharge and reset so I can better manage how I feel.	Therapy to help manage emotional changes.

After analyzing the participants responses to the entrance questionnaire, five major themes were identified as major stressors and challenges of pregnancy: balancing work and pregnancy responsibilities; physical symptoms and discomfort; emotional and mental health; social pressure and unwanted advice; and financial concerns. The second half of the entrance questionnaire identified the following five themes as areas of focus that participants employed as coping techniques during pregnancy: self-care and physical health; support systems; professional and workplace adjustments; mental health and emotional well-being; and financial planning and preparation.

At-Home Music Journals

At the conclusion of each in-person music session, participants were sent home with a physical copy of lyrics and were sent digital access to the music utilized during the in-person session. Additionally, participants were sent a link to a digital journal that included several prompts. Table 4 outlines the journal prompts and participants responses from the first week.

Table 4*At-Home Music Journal Prompts and Responses: Week 1*

Song: Twinkle, Twinkle, Little Star	
<i>As you listened to and/or sang “Twinkle, Twinkle, Little Star,” did you notice any changes in your feelings of stress or anxiety? Reflect on how this lullaby may have influenced your emotional state and if it provided a sense of comfort as you listened to it throughout the week. Did it evoke any memories or emotions related to your pregnancy journey? Did you experience any sensations while you listened to this song? Consider the concept of maternal-fetal bonding. Do you think listening to/singing “Twinkle, Twinkle, Little Star” contributes to this bonding process? Reflect on any thoughts or observations about how this music may have influenced the connection between you and your baby.</i>	
Anne	It brought a sense of nostalgia. I remembered singing this song as a child and it felt comforting. I think it helps me to bond with my baby because the melody is soothing.
Flora	It made me feel calm. It made me think of the hopes and dreams I have for my baby.
Pat	It brought back memories of my childhood. It reminded me that I am about to be a mother. I think it definitely strengthens my bond with my baby, especially the more I sing it.
Alicia	The simpleness and sweetness of the song helped me to relax after a stressful day. Singing made me feel close to my baby and helped me connect. I imagined my baby listening to my voice in my womb.
Rose	It brought me an overwhelming feeling of peace and helped me escape from my daily stresses. I felt closer to my baby while I was singing the song to her.
Louise	I’ve actually already been singing this to my baby since I found out I was pregnant! The melody is calming and I feel really connected to my baby
Marie	This song made me feel really emotional. I was thinking about the future with my baby while singing this song. It helped me to unwind and calm down after a long day.
Mel	I found the song to be comforting. Singing helped me feel relaxed and connected to my baby. It’s a song I’m going to keep singing when I feel stressed.
Isabelle	- The melody is soothing. It helped me to de-stress after a busy day and gave me time to connect with my baby.
Maddy	- This song made me smile. Singing to my baby made me feel like I was already nurturing our bond.

Song: Kumbaya

As you listened to and/or sang “Kumbaya,” did you notice a sense of calm or connection? Reflect on how this song influenced your feelings of bonding with your baby. Did this song provide a sense of emotional support or relief? Consider the lullaby aspect of “Kumbaya.” How does singing or listening to lullabies impact your stress levels and feelings of well-being?

Anne	It had a calming effect for me, I felt like it was almost a spiritual connection. Because I felt calm, I think it made my baby feel calm, too.
Flora	This song has always been comforting to me. I started singing it to my other kids before bed, and it made me feel closer to them and my unborn baby.
Pat	This song is a song that brings people together. It really helped me to relax and allowed me to connect with my baby.
Alicia	Listening to this song brings me feelings of peace. When I was listening, I felt so serene. It helped take my mind off of my stresses and gave me time to breathe and bond with my baby.
Rose	The melody is really soothing. Listening and singing this song feels like a gentle hug for me and my baby.
Louise	This song is definitely calming. It helped me to relax and when I am relaxed, I feel like I can connect better with my baby.
Marie	I felt grounded and at peace. Singing this song helped me feel closer to my baby.
Mel	The song was comforting and helped me to calm down after a long day. It helped me to disconnect from my struggles, which made me feel less stressed and anxious. Singing helped me feel more connected to my baby.
Isabelle	Very calming, it’s a familiar song to me, so I think that is also why I thought it was comforting. Because I knew the song from my childhood, it was special to share it with my baby.
Maddy	It is so peaceful! It really helps me to relax and feel closer to my baby.

Song: Pregnancy Hypnosis

Pay attention to your breathing while listening to this song. How did the music influence your breath and overall sense of relaxation? Did you notice any changes in your breathing patterns (faster, slower, longer breaths, etc.) Did you notice a change in your feelings of stress or tension? Consider the connection between intentional breathing and stress reduction during pregnancy. Did this instrumental song with a focus on free-flowing breathing contribute to your ability to manage stress and anxiety levels?

Anne	The music and focus on breathing helped me feel deeply relax. I noticed my breathing became slower and more rhythmic, I felt less stressed after.
Flora	I found myself breathing deeply and evenly. I felt less tense and felt like I could actually relax.
Pat	My breathing felt more intentional. My slower breathing helped me feel less stressed and anxious.
Alicia	I really focused on the music to guide my breathing. My breathing got deeper, and I felt much more calm.
Rose	Focusing on my breathing helped me to feel centered and connected to my body and baby. I felt really relaxed after and less stressed in the moment
Louise	My breath became slower and more controlled throughout the song. It was a really relaxing experience; I will listen to this song when I am feeling overwhelmed and stressed.
Marie	The deep breathing was so beneficial. I felt more relaxed and less stressed.
Mel	It was soothing to focus on my breath and just listen to the song instead of singing along. I put my hands on my belly when I was breathing, and it was really special.
Isabelle	The music guided my breathing. I noticed my breath got slower and deeper and I felt more relaxed.
Maddy	Focusing on breathing made me feel relaxed, calm, and centered.

Song: Dreamscape Waves (Ocean)

When listening to this song, visualize the pattern of waves moving in and out on the shore. Take a deep breath for the crash and receding of the wave and then try to breathe again with the next wave. Try to adjust your breathing as the ebb and flow of the waves crashing change. What sensations or feelings did you notice while listening to this piece? How did this experience affect your mood and stress levels? Consider the impact of incorporating nature-inspired sounds into your prenatal music listening routine. Did the ocean sounds reduce your stress and anxiety levels? If yes, how might this stress reduction positively affect your pregnancy? Share your thoughts on listening to nature-inspired sounds.

Anne	Listening to this song reminded me of being on vacation. I felt more relaxed and my mood lifted.
Flora	The sounds of the ocean made me feel peaceful and grounded. I felt connected to nature and to my baby.
Pat	The waves were calming and soothing, I closed my eyes and pictured the waves moving in and out and it helped me to breath. I was able to unwind which reduced my stress and anxiety.
Alicia	Visualizing the waves was helpful while listening to this song, it made it easy to sync my breathing to them. When I am stressed, listening to this song will help me feel calm and manage my stress levels.
Rose	The ocean sounds were relaxing. Imagining the waves helped me feel at ease. I felt less stressed after listening to this song.
Louise	The waves were really calming. I felt relaxed and enjoyed being able to connect to my breath.
Marie	The ocean sounds were soothing, they made me feel like I was on vacation. It was a nice escape from the busyness of life and allowed me to peacefully connect to my baby.
Mel	The ocean sounds made me feel at ease. I felt my stress floating away with the receding waves, the visualization was helpful too.
Isabelle	Listening to the ocean waves was like a mental vacation. I was able to relax and felt an overwhelming sense of peace.
Maddy	This song and exercise was very calming, I think it'll be beneficial during labor, too. I felt really relaxed and confident in my body.

After the second music session, participants were once again sent home with a physical copy of lyrics and were sent digital access to the music utilized during the second in-person session. Participants were instructed to use the same link to access the online journal. Table 5 outlines the journal prompts and participants responses from the second week.

Table 5*At-Home Music Journal Prompts and Responses: Week 2*

Song: Stay Awake	
<i>As you listened to and/or sang “Stay Awake,” did you notice any changes in your feelings of stress or anxiety? Reflect on how this lullaby may have influenced your emotional state and if it provided a sense of comfort as you listened to it throughout the week. Did it evoke any memories or emotions related to your pregnancy journey? Did you experience any sensations while you listened to this song? Consider the concept of maternal-fetal bonding. Do you think listening to/singing “Stay Awake” contributes to this bonding process? Reflect on any thoughts or observations about how this music may have influenced the connection between you and your baby.</i>	
Anne	This song had a calming effect. The gentle melody reminded me to cherish each moment with my baby. I found myself reflecting on my pregnancy journey and felt a sense of closeness to my baby.
Flora	This song made me feel peaceful and connected to my baby. Singing this song to my baby made me feel full of love.
Pat	This songs comforting lyrics provided emotional relief during times when I was feeling exhausted or stressed. Singing this song to my baby created a nurturing environment for both of us.
Alicia	The lyrics of this song made me feel relaxed and helped me to unwind when I was singing it to my baby. Singing this song helped me to feel closer and more connected to my baby.
Rose	I felt so connected to my baby when singing this song, I know I’ll continue to sing it once my baby is born. This lullaby is comforting for both me and my baby.
Louise	This lullaby made me feel tranquil. The melody was really pretty and the lyrics were heartfelt; they made me feel less anxious.
Marie	I felt more grounded and centered after listening to this lullaby. I felt really connected to my baby and imagined singing this lullaby to my baby after he/she is born.
Mel	The melody was soothing and helped me to feel less stressed. Singing this song to my baby was really comforting and made me feel closer to my baby.
Isabelle	I felt so much love when singing this song to my baby. I could imagine my baby happily listening to this song in my womb, it was so special.
Maddy	Singing this song felt like wrapping myself and my baby in a big hug. It brought me a sense of peace and I felt connected to my baby. I can’t wait to sing it to my baby when he/she is born.

Song: You Are My Sunshine

As you listened to and/or sang “You Are My Sunshine,” did you notice a sense of calm or connection? Reflect on how this song influenced your feelings of bonding with your baby. Did this song provide a sense of emotional support or relief? Consider the lullaby aspect of “You Are My Sunshine.” How does singing or listening to lullabies impact your stress levels and feelings of well-being?

Anne	I felt a sense of warmth and connection with my baby. The song was a lullaby, which positively impacted my stress levels, I felt more grounded.
Flora	The melody was very soothing and uplifted my spirits when I felt doubtful and tired. I felt relaxed when I was singing this song to my baby.
Pat	The melody was uplifting and the lyrics helped me to bond with my baby. I felt very calm after singing and listening to this song.
Alicia	After singing this song to my baby, I felt less stressed. I felt really connected to my baby when singing this song.
Rose	I love how singing this song made me feel closer to my baby. Singing to my baby filled my heart with love and happiness.
Louise	This song encouraged me when I was feeling fired and doubting my abilities as a mother. The lullaby was soothing and helped me to relax, which made me feel less stressed.
Marie	The gentle melody allowed me to really connect with my baby. I closed my eyes when singing, and could picture my baby listening to my voice in my womb.
Mel	I enjoyed listening to this lullaby and singing it to “my sunshine!”
Isabelle	This lullaby was so peaceful, I love how calm the music was. I definitely felt connected to my baby, but also just enjoyed how I, myself, felt after listening, I felt relaxed.
Maddy	I felt at ease singing this song to my baby. It was a very peaceful and calming experience.

Song: Womb Sounds with Mother's Heartbeat

As you listen to this song, visualize your baby in your womb and imagine the sounds they are hearing. Try taking breath in for 4 heart beats and breathing out for the next 4 heart beats. How did the music influence your breath and overall sense of relaxation? Did you notice any changes in your breathing patterns (faster, slower, longer breaths, etc.) Did you notice a change in your feelings of stress or tension? Consider the connection between intentional breathing and stress reduction during pregnancy. Did this instrumental song with a focus on rhythmic breathing contribute to your ability to manage stress and anxiety levels?

Anne	The rhythmic heartbeat reminded me of my own heartbeat, and I tried to sync my breath with it. My breaths became slower and deeper. Focusing on my breathing helped me feel more in control of my anxiety.
Flora	While listening, I visualized my baby nestled safely in my womb. I tried the breathing exercise and noticed my breaths became longer, my usual tension melted away.
Pat	The breathing practice slowed my breath significantly, it was much more regular. I enjoyed the visualization exercise, it helped to reduce my anxiety. The rhythmic breathing combined with the music was powerful.
Alicia	I visualized my baby being comforted by my own heartbeat. The breathing exercise made me feel peaceful and really connected to my baby.
Rose	My breathing became slower and more intentional. I felt tranquil and less anxious. I will use this exercise to help me manage my stress, because I felt less stressed after listening to this song.
Louise	I imagined my baby floating peacefully, listening to my heartbeat – I felt so connected to my baby! The breathing exercise was challenging at first, but as my breath became deeper and more consistent, I began to relax.
Marie	The breathing exercise combined with this relaxing song made me feel calm and relaxed. The rhythmic breathing made me feel more connected to my baby.
Mel	I felt a strong connection to my baby while listening to this song and focusing on my breathing. I noticed that my breaths became further apart, and I felt my stress becoming less and less. This exercise helped me to really tune into my body and baby.
Isabelle	The music was very calming and helped me to manage my anxiety. I felt my body begin to relax more and more as I focused on my breath.
Maddy	I loved picturing my baby's serene environment while completing this exercise. My breaths slowed, and I felt really connected to my baby. This was a soothing experience for me, and I think my baby was soothed, too.

Song: Crystal Bowls

When listening to this song, consider adding vocalisations using low sounds like “oooooooooooo” and “uuuuuuuuu,” as you feel comfortable. What sensations or feelings did you notice while listening to this piece? How did this experience affect your mood and stress levels? Consider the impact of incorporating instrumental sounds into your prenatal music listening routine. Did the music reduce your stress and anxiety levels? If yes, how might this stress reduction positively affect your pregnancy? Share your thoughts on listening to instrumental sounds.

Anne	At first, the vocalizations felt uncomfortable, but as I did more, I could feel the vibrations throughout my body. I really like instrumental sounds, compared to songs with lyrics – they help me to stay relaxed.
Flora	The sounds were mesmerizing, and the vocalizations pulled me even deeper into a relaxed state. The vibrations made me tune into my body and the little feelings I am experiencing during my pregnancy.
Pat	The music and my voice together reminded me of meditating. The instrumental sounds allowed me to focus on connecting with my baby. I felt less stressed after this exercise.
Alicia	The vibration of the vocalization in my body and the feel of the vibrations from the crystal bowls on the floor were so relaxing and powerful at the same time. I felt a noticeable decrease in my stress levels, which is beneficial for mine and my baby’s health.
Rose	A massage for the soul! I find that instrumental music has been most helpful for managing my anxiety. Instrumental music also helps me create a calm environment for my baby.
Louise	I loved the combination of the crystal bowls and vocalizations, it was a beautiful, serene soundscape. I felt my stress leaving my body and felt really positive after.
Marie	The sound of the bowls made me feel comfortable enough to add the vocalizations. I know that this exercise is beneficial health-wise for me and my baby, because I felt less stressed after and I know that stress is not good for the baby.
Mel	The crystal bowls and vocalizations felt like a good therapy session. This experience has shown me the power of music in reducing stress. With reduced stressed levels, I feel more at peace.
Isabelle	I felt a significant reduction in my stress levels. After the exercise, I felt refreshed and calm for the rest of the day.
Maddy	I felt so relaxed after listening to this song. I know that being relaxed is good for not only my well-being but my baby’s health, too.

Exit Questionnaire

At the conclusion of the study, participants were sent a digital exit questionnaire to determine if the music treatments helped them deal with pregnancy challenges, what music coping techniques were most helpful, if participants thought music was beneficial during pregnancy, and if participants would continue using music as a form of stress management during pregnancy. The following four tables outline participants' reflections on the study activities.

Table 6*Music Treatments*

Participant	Did the music treatments help you deal with the challenge(s) you face in your pregnancy journey? If yes, please explain how. If no, please explain why not.
Anne	The music treatments were so helpful. Listening to calming music in the mornings helped me to feel more relaxed and less anxious about the day ahead. It was nice using music in my morning routine; it helped me start my day with a strong feeling of stability.
Flora	I enjoyed listening to the music, especially the lullabies, but I think my stress levels are more closely tied to my physical discomfort.
Pat	I noticed that the soothing nature sounds and instrumental music helped me to sleep better at night.
Alicia	The music treatments helped to distract me from my worries.
Rose	Listening to the various prescribed songs helped me to rest after a long day of work. It helped me to calm down and connect with my baby.
Louise	The music didn't help with my physical discomforts, but it did help me to relax and encouraged me to connect with my baby, which was a good distraction.
Marie	The music helped me connect better with my body and gave me a sense of purpose when I would sit by myself and really focus on connecting with my baby while listening to the music.
Mel	Listening to music didn't help me to feel better about my changing body and looks, but I do think it helped me to stay more positive, and I enjoyed connecting with my baby while listening to the lullabies.
Isabelle	When I would feel stressed out for work, listening to the music helped me to stay positive, especially when I was overwhelmed.
Maddy	The reflective journaling added to the at-home listening helped me process my emotions. I noticed fewer mood swings and felt that my emotions were less volatile when I listened to the prescribed music daily.

Table 7*Musical Coping Techniques*

Participant	What musical coping techniques best help you to manage stress, anxiety, and depression?
Anne	Listening to calming lullabies in the mornings.
Flora	Playing the lullabies in the background throughout my day.
Pat	Nature sounds and instrumental songs before I go to bed.
Alicia	Whenever I needed a distraction or to get my mind in a better place, I enjoyed doing the exercise with the vocalizations. It really allowed me to get everything out, and I felt really relieved after.
Rose	After work, I used the music to help me wind down and relax. I like the instrumental songs because they allowed my mind to drift off.
Louise	I liked the song where we focused on breath. Putting my hands on my belly and deep breathing with the waves allowed me to connect with my baby.
Marie	Listening to the lullaby at different times throughout the day helped me to continually connect with my baby. I found this to be helpful when I could feel my anxiety levels rising or when negative thoughts would come into my mind. The music helped to distract me and make me feel calm.
Mel	I enjoyed singing the lullabies to my baby, and it helped me to connect.
Isabelle	Listening to the songs that focused on breathing helped me to disconnect from my stressful life and focus on slowing down.
Maddy	The music journaling helped me to get my feelings on paper.

Table 8*Musical Benefits During Pregnancy*

Participant	Do you think that music is beneficial during pregnancy? If yes, please explain how. If no, please explain why not.
Anne	Yes, it can be useful in a routine, which helps create a sense of calm that is much needed during pregnancy.
Flora	I think it can be beneficial, but I think my physical symptoms are most limiting. Either way, I still enjoyed taking part in the music listening and the in-person classes.
Pat	Yes, I noticed it really helped improve my quality of sleep. I felt significantly more rested the next day when I listened to music before bed.
Alicia	Yes, it served as a great distraction from my worries and issues I was facing during my pregnancy.
Rose	Yes, I felt a huge sense of relief whenever I listened to the music. The music was comforting, and I'd always look forward to listening.
Louise	Yes, I love how it helped me bond with my baby. I felt so close to my baby after I sang and listened to the music.
Marie	Yes, I felt a sense of purpose in my pregnancy when I was listening to the music and connecting with my baby; I felt less alone in my pregnancy and enjoyed it more.
Mel	Yes, I think it's great for bonding, and I found I felt encouraged and uplifted after I purposely set aside time to listen to the songs and sing to my baby.
Isabelle	Yes, listening to the songs helped me to stay positive and to keep persevering throughout my pregnancy, especially on hard days.
Maddy	Yes, I think music was beneficial, especially alongside the journaling. The music reflections were my favorite part.

Table 9*Continuation of Music for Stress Management During Pregnancy*

Participant	Will you continue to use music as a form of stress management during pregnancy? If yes, which techniques will you employ?
Anne	Yes, I plan to continue to listen to music in the morning, even after my baby is born.
Flora	Yes, if there were more in-class gatherings, I would definitely participate in those. All the music was really calming; I couldn't help but feel less stressed after listening.
Pat	Yes, listening to music before bed has been a game-changer!
Alicia	Yes, I will continue listening to music as a positive distraction.
Rose	Yes, I love that I can turn to music as a comfort measure during my pregnancy.
Louise	Yes, I will continue to use it to bond with my baby! I want to learn more songs to sing to my baby so that we can keep developing our special bond throughout the last few weeks of my pregnancy.
Marie	Yes, listening to music and connecting with other moms in the music class was really encouraging and helped me enjoy my pregnancy more.
Mel	Yes, being intentional about setting time aside to connect with my baby was helpful for my stress levels.
Isabelle	Yes, it's been beneficial in uplifting my spirits, so I will continue to use it throughout my pregnancy.
Maddy	Yes, I will! I want to find additional songs and plan to continue journaling about how the songs make me feel and how I connect with my baby for each different song.

Themes

The entrance questionnaires, journal entries, and exit questionnaires were analyzed to identify significant themes that described participants' experience with music interventions and their impact on stress levels during pregnancy. For each source of data collection, five themes were identified. A discussion of these themes is presented to further identify participants' interpretation of their experience with the impact of music on anxiety and stress levels during pregnancy.

Entrance Questionnaire Themes

The first question on the entrance questionnaire asked participants to identify their most significant challenge(s) in their pregnancy journey. The responses identified five themes outlining the most common challenges: balancing work and pregnancy, managing physical discomforts and symptom, emotional challenges and support needs, financial concerns, and family and childcare responsibilities. The second question on the entrance questionnaire asked participants how the challenges presented in the first question caused additional stress or feelings of anxiety/depression. Their responses revealed the following five themes that led to increased stress or feelings of anxiety/depression: trouble balancing responsibilities, concerns about health and performance, financial stress and uncertainty for the future, social pressure and lack of support, and body image and personal well-being. The third question on the entrance questionnaire asked participants what coping techniques they were using to deal with feelings of stress, anxiety, and depression. The most common coping techniques were identified in the following five themes: self-care practices, support systems and communication, managing work and physical discomfort, practical and financial planning, and setting boundaries and prioritizing personal needs. The final question on the entrance questionnaire asked participants what coping suggestions their doctor or midwife has suggested to help them cope with stress, anxiety, and depression. Based on participant responses, five suggestions and themes were identified: rest and physical health, support systems and assistance, workplace adjustments and accommodations, counseling and professional support, relaxation and mindfulness techniques. The themes revealed in the entrance questionnaire help provide insight into how music can address the needs of pregnant women to aid in stress management during pregnancy. These themes and their application will be further discussed in the following section.

Music Journal Themes

As a result of the participant's responses in their music reflection journals during the first week of the study, the five themes identified in the journal prompt for the first song, "Twinkle, Twinkle Little Star," were calming and relaxing effect, enhanced maternal-fetal bonding, emotional and psychological comfort, reflecting on pregnancy journey, and anticipation and future connection. In response to the journal prompt for the second song, "Kumbaya," the following five themes were identified: calming and relaxing effect, enhanced maternal-fetal bonding, emotional support and relief, nostalgia and familiarity, and improved overall well-being. The journal prompt for the third song, "Pregnancy Hypnosis," uncovered five themes: relaxation and calmness, changes in breathing patterns, reduction of stress and tension, connection with body and baby, guided breathing; and stress management. The journal prompt in response to the fourth song, "Dreamscape Waves (Ocean)," revealed five themes: relaxation and mood improvement, connection to nature and baby, stress and anxiety reduction, breath synchronization, and mental escape and visualization.

As a result of the participant's responses in the music reflection journals during the second week of the study, the five themes identified in the journal prompt for the first song, "Stay Awake," were calming effect and relaxation, emotional connection and maternal-fetal bonding, pregnancy journey reflection, emotional comfort through the reduction of stress and anxiety, and anticipation of future bonding. In response to the journal prompt for the second song, "You Are My Sunshine," five themes were identified: calming effect and relaxation, emotional connection and bonding, emotional support and relief, reduced stress and anxiety, and feelings of love and happiness. The journal prompt for the third song, "Womb Sounds with Mother's Heartbeat," uncovered the following five themes: rhythmic breathing alignment,

emotional connection and visualization, reduction in anxiety and stress, improved breathing patterns, and enhanced relaxation and calmness. The journal prompt in response to the fourth song, “Crystal Bowls,” revealed five themes: sensory experience and comfort, improved stress and anxiety levels, enhanced relaxation and mood, connection to prenatal health, and a preference for instrumental sounds.

Exit Questionnaire Themes

The first question on the exit questionnaire asked participants if the music treatments presented in the study helped them deal with the challenge(s) they faced in their pregnancy journey. As a result of the participant’s responses, five themes were identified: enhanced relaxation and anxiety reduction, improved sleep quality, emotional distraction and connection, positive impact on mood and stress management, and the value of journaling and reflection. The second question on the exit interview asked participants what music coping techniques were most helpful in managing stress, anxiety, and depression. As a result of the participant’s responses, the five most common themes were calming lullabies and instrumental music, nature sounds for relaxation and sleep, breathing and vocalization exercises, distraction and emotional relief, and music journaling for emotional processing. The third question on the exit interview asked participants if they thought music was beneficial during pregnancy. As a result of the participant’s responses, five themes were identified: enhanced relaxation and calm, improved sleep quality, emotional relief and distraction, increased bonding with the baby, and positive impact on mood and motivation. The final question on the exit interview asked participants if they would continue using music as a form of stress management during the rest of their pregnancy, and if yes, which techniques they would employ. Their answers identified five themes: use of music for relaxation, continued bonding with baby, interest in group sessions,

music as a positive distraction, and music journaling for emotional well-being. The themes identified in the exit questionnaire prove that music can benefit stress management during pregnancy.

Summary of Themes

Based on the seventy-eight minor themes identified by analyzing the participant's entrance questionnaires, weekly music journals, and exit questionnaires, five major themes were identified to reveal the theoretical and practical implications of music for stress management during pregnancy. The major themes identified address the various dimensions of stress management, emotional support, and well-being concerning the study's purpose of examining how music interventions impact stress levels during pregnancy. Table 10 outlines the major themes identified from the seventy-eight minor themes.

Table 10*Major and Minor Themes*

Major Theme	Minor Themes
Emotional and Psychological Support	Emotional challenges and support needs; Emotional and psychological comfort; Emotional support and relief; Emotional connection and maternal-fetal bonding; Emotional comfort through the reduction of stress and anxiety; Feelings of love and happiness; Emotional distraction and connection; Emotional connection and visualization; Nostalgia and familiarity; Positive impact on mood and stress management; Reflection on pregnancy journey; Anticipation and future connection; Anticipation of future bonding; Support systems and communication; Counseling and professional support.
Stress and Anxiety Management	Relaxation and mindfulness techniques; Calming and relaxing effect; Stress management; Reduction of stress and tension; Stress and anxiety reduction; Calming effect and relaxation; Enhanced relaxation and calmness; Enhanced relaxation and anxiety reduction; Improved stress and anxiety levels; Mental escape and visualization; Guided breathing; Breath synchronization; Rhythmic breathing alignment; Changes in breathing patterns; Improved breathing patterns; Relaxation and mood improvement; Calming lullabies and instrumental music; Nature sounds for relaxation and sleep; Music journaling for emotional processing.
Bonding and Connection	Enhanced maternal-fetal bonding; Connection with body and baby; Increased bonding with baby; Connection to prenatal health; Emotional connection and bonding; Connection to nature and baby; Anticipation and future connection; Continued bonding with baby; Feelings of love and happiness; Emotional connection and maternal-fetal bonding.
Self-Care and Well-being	Self-care practices; Rest and physical health; Improved overall well-being; Enhanced relaxation and mood; Improved sleep quality; Sensory experience and comfort; Value of journaling and reflection; Music journaling for emotional well-being; Positive impact on mood and motivation; Relaxation and calmness; Calming lullabies and instrumental music.
Practical and Social Considerations	Balancing work and pregnancy; Managing physical discomforts and symptoms; Financial concerns; Family and childcare responsibilities; Trouble balancing responsibilities; Concerns about health and performance; Financial stress and uncertainty for the future; Social pressure and lack of support; Body image and personal well-being; Support systems and assistance; Practical and financial planning; Setting boundaries and prioritizing personal needs; Workplace adjustments and accommodations; Interest in group sessions; Support systems and communication; Workplace adjustments and accommodations.

Research Question Responses

This study was guided by a central research question and two sub-questions designed to investigate whether music interventions positively impact stress levels during pregnancy. The aim was to determine what participants identified as their primary stressors during pregnancy, how music can support the identified stressors, and if they found music effective in supporting stress management during pregnancy. Five major themes were identified from the entrance questionnaire, music journals, and exit questionnaire in the previous section. This section aligns the major themes with the corresponding research question.

Central Research Question

How do music interventions affect stress levels during pregnancy?

Pregnancy is a period marked by significant emotional and physiological changes, which often lead to increased stress levels. By exploring music interventions on stress levels during pregnancy, this study uncovered how musical interventions can serve as a therapeutic tool to reduce stress levels and holistically enhance overall maternal health. Through qualitative analysis of participant responses, the researcher identified two major themes that correspond with the central research question: emotional and psychological support and stress and anxiety management.

Emotional and physiological changes, including anxiety, hormone-induced mood changes, heightened stress levels, and physical discomforts can be detrimental to a woman's health and well-being during pregnancy. Therefore, emotional and psychological support is critical in the management of stress during pregnancy for both the health of the mother and the developing child. Participants in this study reported that listening to calming music, engaging in music-based activities, and incorporating musical relaxation exercises in their daily routines

significantly reduced their feelings of stress, anxiety, and emotional distress. This study further uncovered that music, as a form of stress management, helps to foster a sense of calm, provides mothers with an emotional outlet, and establishes a therapeutic atmosphere that supports emotional resilience during pregnancy.

During pregnancy, elevated levels of stress and anxiety can negatively impact a woman's pregnancy experience and lead to a range of physical and emotional problems.²³¹ To cope with these problems, people all over the world often turn to tranquilizing medications, "which have a lot of negative contraindications and side effects."²³² These medications are often not safe for use during pregnancy, so non-pharmacological therapeutic interventions, such as music, are necessary for the prevention and management of stress.²³³ Of the ten participants who participated in this study, every participant identified the positive effects music had on their stress and anxiety levels during pregnancy. This study identified non-pharmacological interventions, including guided relaxation with music, rhythmic breathing exercises, music journaling, and calming lullabies as structured methods to manage stress and anxiety, improve emotional resilience, and create a more positive pregnancy experience.

²³¹ Martina de Witte et al., "Music Therapy for Stress Reduction: A Systematic Review and Meta-Analysis," *Health Psychology Review* 16, no. 1 (November 27, 2020): 1–26, <https://doi.org/10.1080/17437199.2020.1846580>.

²³² Ibid.

²³³ Ibid.

Sub-Question One

How can practitioners implement music interventions as a holistic approach to stress management during pregnancy?

When considering how practitioners can implement music interventions as a holistic approach to stress management during pregnancy, the themes of self-care and well-being and practical and social considerations are particularly relevant. In this study, participants highlighted that music interventions not only provided emotional relief but also positively contributed to their overall self-care and well-being. Participants identified that listening to calming music in the mornings or engaging in breathing exercises synchronized with music helped them to maintain a balanced and relaxed state of mind. The positive results of incorporating music into the daily routines of pregnant women as a self-care practice support the intentional use of music to manage emotional health and resilience during pregnancy.

Furthermore, participants expressed the benefits of group music sessions and the value of shared musical experiences, which support the theme of practical and social considerations. Participants noted that the group sessions facilitated social support and a sense of community, which further enhanced the overall effectiveness of music interventions. The research suggests that practitioners can implement these findings and better serve the pregnant women they care for by offering structured music therapy sessions, including individual and group activities, and ensuring that music interventions are accessible and integrated into prenatal care plans. Incorporating music into prenatal care plans, alongside ultrasounds, blood tests, and nutritional consultations, can create a supportive environment that addresses both the social and emotional needs of their patients. This approach ultimately promotes holistic well-being and offers a compelling, non-pharmacological approach to stress management during pregnancy.

Sub-Question Two

How do music interventions affect pregnancy outcomes?

The theme of bonding and connection is crucial to exploring how music interventions affect pregnancy outcomes. In this study, participants frequently reported that music facilitated a stronger emotional bond with their unborn babies. They noted that this increased bonding contributed positively to their overall pregnancy experience, lowering their stress and anxiety levels. Activities including listening to lullabies, engaging in guided musical breathing exercises, and singing to their babies were practices that participants identified as enhancing their maternal-fetal bond. In addition to feelings of a strengthened mother-baby connection, participants highlighted the emotional comfort of musical activities, which promoted a sense of purpose and well-being – all supporting a healthy pregnancy. Practically, this indicates that music interventions can be strategically implemented to foster improved maternal-fetal attachment, thereby improving psychological outcomes for the mother and potentially improving fetal development and birth outcomes. Healthcare practitioners can incorporate these insights by recommending musical activities that encourage bonding, helping patients create personalized playlists supporting relaxation and connection, and facilitating group music sessions. By promoting bonding and connection through music, practitioners can better support maternal emotional health, which is closely linked to improved pregnancy outcomes, including reduced stress, less anxiety, and improved mood.

Summary

The major themes identified in this study provide a holistic understanding of how music interventions can positively impact stress levels during pregnancy. By uncovering the emotional, psychological, physical, and social needs of women during pregnancy, these themes offer

comprehensive insights into the multifaceted role of music in managing stress during pregnancy. These themes reveal practical implications for using music during pregnancy to enhance well-being, reduce stress, anxiety, and depression, and support pregnant women emotionally and psychologically.

Chapter Five: Conclusions

Overview

The purpose of this qualitative hermeneutic phenomenological study was to examine how music interventions impacted stress levels during pregnancy. The aim was to uncover whether music can be implemented during pregnancy to improve maternal stress levels and facilitate a more positive pregnancy experience. Chapter Five begins with a summary of the five main thematic findings from the analysis of the entrance questionnaires, music journals, and exit questionnaires, as discussed in Chapter Four. This is followed by an interpretation of the themes, which leads to the implications for practice. This chapter concludes with recommendations for future studies and the study's conclusion.

Summary of Findings

Despite pregnancy being a period when women are highly focused on their health and well-being, stress management continues to be an overlooked area of prenatal care. The stress management treatments that are currently offered to pregnant women are often pharmaceutical-based and carry a risk of severe side effects. While prenatal doctors' appointments should be a time for mothers to connect with and seek help from their provider for stress management techniques, these visits, while frequent, are often brief, lasting only five to ten minutes. As a result, mothers seldom have the opportunity to discuss their pregnancy concerns in-depth, including stress, anxiety, and depression. Furthermore, the available information on managing stress and anxiety during pregnancy is vague, confusing, and impractical for many mothers to implement in their daily lives. Music therapy, despite being one of the most underutilized yet effective treatments for stress management during pregnancy, is not readily available to the mothers who need it most. Additionally, there is a notable gap in the literature regarding how

music can be effectively employed as a holistic treatment for stress management during pregnancy. This study addresses this significant gap and seeks to improve prenatal care in order to provide women with safe, effective, accessible, and practical options for managing stress during pregnancy.

After a thematic analysis of the entrance questionnaires, music journals, and exit questionnaires, five main themes emerged that highlight the significant impact of music interventions on stress management during pregnancy. These themes support the need for a new format of prenatal care that incorporates music as a holistic approach to stress management. The five themes identified underscore the importance of music for promoting relaxation, providing emotional and psychological comfort, enhancing mood, and fostering maternal-fetal bonding, which all support the management of stress, anxiety, and depression during pregnancy. By integrating music interventions into prenatal care, healthcare providers can offer a more comprehensive and supportive approach to the severely overlooked area of stress management during pregnancy.

Interpretation of Themes

The first theme, *Emotional and Psychological Support*, captures the importance of music interventions for emotional and psychological comfort during pregnancy. This major theme identifies the emotional challenges, support needs, and the impact of music on women's emotional well-being. Participants reported that the musical activities used in this study provided significant emotional support and helped them manage emotional challenges, which resulted in reduced stress and anxiety levels. Based on the data collated from the entrance interviews, music journals, and exit interviews, it was identified that music is an impactful tool for emotional

support and further helps reduce stress, anxiety, and depression by offering psychological comfort through fostering a sense of connection and bonding.

The second theme, *Stress and Anxiety Management*, illustrates the effects of music on relaxation and anxiety reduction through various techniques, like musical guided breathing and musical mindfulness. Participants consistently reported that music helped them relax and reduce anxiety, highlighting techniques including guided breathing, musical mindfulness, and listening to calming lullabies as being most beneficial. Participants overwhelmingly noted that nature sounds and instrumental music were most helpful for stress reduction and overall relaxation. The data collated from the entrance interviews, music journals, and exit interviews identified music as a tool for lowering stress and anxiety levels through relaxation, breathing, and mindfulness while participating in music activities and listening to music. As a result of these activities, participants noted a more relaxed and calm state.

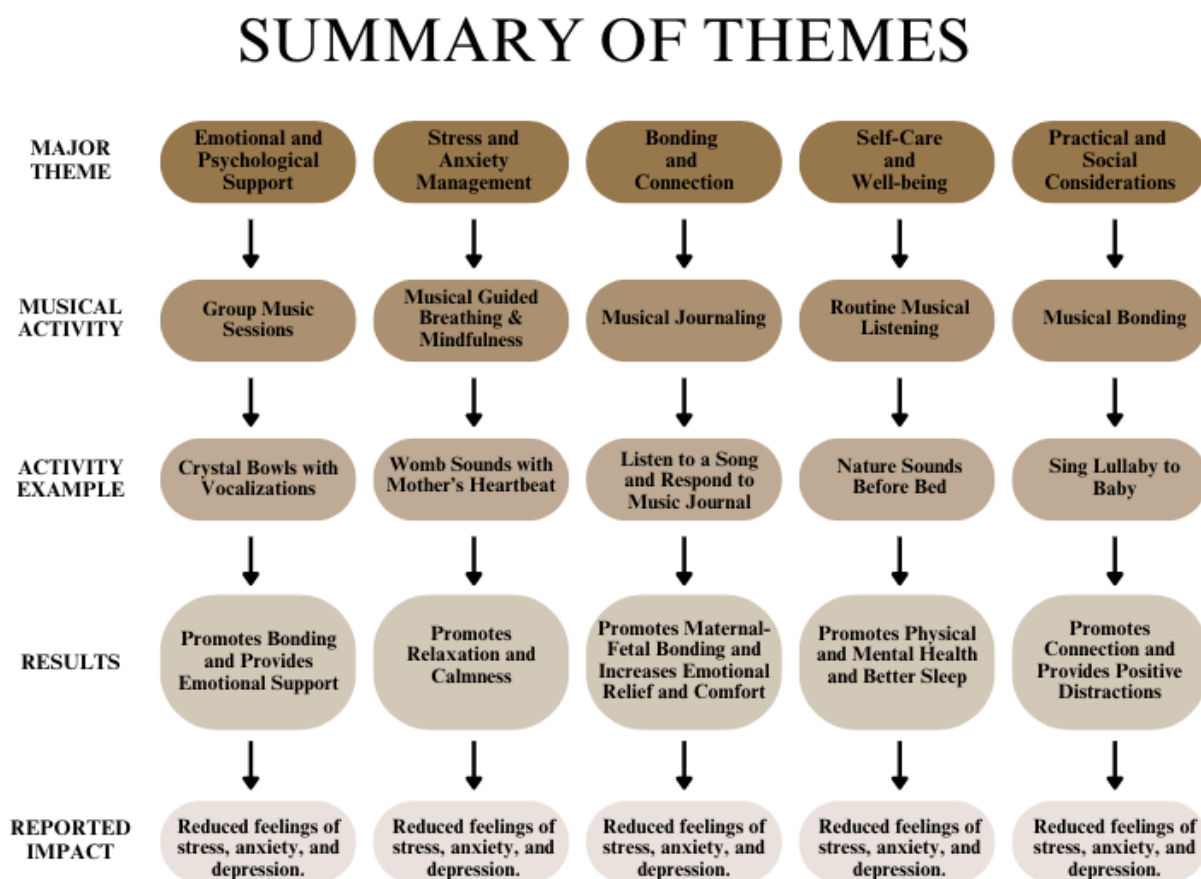
The third theme, *Bonding and Connection*, highlights the role music plays in enhancing maternal-fetal bonding and how emotional and physical connections can be fostered through music. Participants reported a stronger bond with their baby during musical activity or music listening, which provided them with enhanced emotional comfort and a greater sense of purpose during pregnancy. Based on the data collected from the entrance interviews, music journals, and exit interviews, participants noted that stress levels can be positively affected through maternal-fetal bonding that is facilitated through musical listening and participation. As a result of this increased bonding, participants reported increased emotional relief and comfort, which is crucial in mitigating stress and fostering a more positive and healthy pregnancy experience.

The fourth theme, *Self-Care and Well-being*, identifies how participating in music activities and listening to music contributes to improved personal care, including self-care

practices, sleep quality, overall well-being, and physical health. Participants reported that incorporating music into their daily routines positively benefitted their physical and mental health, leading to increased feelings of rest and calmness, which is crucial for stress management. As a result of the data collected from the entrance interviews, music journals, and exit interviews, it was identified that music interventions promote self-care and better sleep, which contribute to lower stress levels. Participants noted that feeling rested and cared for makes them feel more emotionally balanced and stable.

The fifth theme, *Practical and Social Considerations*, addresses the broader context of pregnancy, including managing physical discomfort, social and financial concerns, and work-life balance. It is essential to understand these practical and social factors, as they provide a comprehensive view of the various stressors pregnant women face and how music can address these stressors. Participants found that music helped them to manage practical and social stressors by providing positive distraction, emotional support, and increased connection to friends, family, and their baby. Based on the data collected from the entrance interviews, music journals, and exit interviews, it was identified that music interventions that address these areas can help alleviate stress by providing social connection, a sense of control and balance, and practical support.

The major themes identified from the participant's entrance interviews, music journals, and exit interviews provide robust evidence and practical examples of how music can effectively manage stress during pregnancy. These themes demonstrate how music can offer emotional and psychological comfort, reduce stress and anxiety, enhance bonding, promote self-care and well-being, and support the practical and social aspects of pregnancy.

Figure 1*Summary of Themes*

Implications for Practice

The findings of this study demonstrate the viability of music interventions as a valuable tool in prenatal care, specifically stress management during pregnancy. By integrating music into standard prenatal care protocols, healthcare providers can offer a holistic approach to stress management that addresses the emotional, psychological, and physical well-being of pregnant women. The practical implementation of these findings can be realized in five ways: incorporating music into prenatal care plans, creating supportive environments, enhancing

patient education and engagement, supporting maternal-fetal bonding, and reducing reliance on pharmaceutical interventions.

Incorporating music into prenatal care plans can be a beneficial addition to routine prenatal care. Practically, this could involve recommending specific types of music or musical activities based on the patient's needs and preferences. For example, guided musical breathing exercises, calming lullabies, or instrumental music listening could be suggested or prescribed to help reduce the patient's anxiety, improve sleep quality, and enhance relaxation. Unfortunately, most practitioners are not trained in the area of music therapy and many do not have the time or resources available to obtain this specialization. This highlights the need to develop a prenatal music program for stress management that providers could prescribe to their patients. A well-designed prenatal music program would offer practitioners a ready-to-use tool that can be easily prescribed to patients without the need for additional training or expertise. Developing a standardized prenatal music program would ensure that all pregnant women, regardless of their location or healthcare provider, have access to a high-quality, evidence-based resource for stress management. Additionally, this proposed music program could be integrated with other existing prenatal care programs provided at hospitals and in communities, such as childbirth education classes.

Music can also be used to create a calming and emotionally supportive environment in prenatal care settings, including hospitals, clinics, birthing centers, and home-based practices. Playing soothing music in waiting rooms, examination rooms, or during labor leads to reduced stress and anxiety levels for expectant mothers. Additionally, group music sessions or music-based prenatal classes can help expectant mothers foster a sense of community and enhance their emotional supports, further improving the overall prenatal experience.

The study's findings suggest that music interventions can be a powerful tool for educating pregnant mothers about the importance of stress management and self-care. This study further indicates that healthcare providers should share resources with expectant mothers on using music effectively to manage stress and improve their well-being. This might include sharing relaxing playlists, offering music therapy referrals, or providing tips on how to incorporate music into their daily routine. By empowering women with these resources, healthcare providers can promote more engagement in self-care practices, consequently leading to improved prenatal and birth outcomes.

One of the significant benefits of music during pregnancy, outlined in this study, is the role of music in enhancing maternal-fetal bonding, which is crucial for emotional well-being and psychological health during pregnancy. Providers can encourage pregnant women to use music to connect with their babies through singing, listening to lullabies, and participating in musical activities involving movement and rhythm. The study's findings suggest that music-based maternal-fetal bonding activities foster a stronger emotional connection and provide a sense of purpose and comfort during pregnancy.

By offering music as a holistic approach to managing stress and anxiety during pregnancy, practitioners can reduce their reliance on pharmaceutical treatments that carry significant risks for both the mother and the developing fetus. Music interventions are a safe, accessible, and cost-effective option that can be easily catered to each individual's needs, making them an attractive addition to prenatal care and stress management during pregnancy.

The integration of music interventions into prenatal care offers a comprehensive, alternative, and holistic approach that aligns with the increasing need for supporting mental and emotional health in pregnancy. By adopting these practices, healthcare practitioners who provide

care to pregnant women can offer more personalized and effective care while improving the pregnancy experience and supporting women's need for stress management during pregnancy.

Limitations

Several limitations that may influence the interpretation of the findings were identified while conducting this study. While this research provides significant insight into the impact of music interventions on stress management during pregnancy, it is vital to consider the following factors that may have affected the study's outcomes. These limitations include the sample size, demographics, reliability of self-reported data, emotional influence, diverse musical preferences, and study length.

This study was conducted with a sample size of ten, which is relatively small. This may limit the generalizability of the findings. A larger, more diverse sample could be beneficial to strengthen the study's conclusions and ensure the results and proposed implications for practice are applicable to a broader population.

The sample of pregnant women in this study were located in the same geographic region due to the nature of the study's data collection method, which included two in-person music sessions. The location of the study, Georgetown, Ontario, is an upper-class city where most residents have a favorable socio-economic status. A more diverse sample that includes pregnant women from different cities, provinces, or countries would be beneficial to better identify how music is perceived in varied geographic locations with different socio-economic statuses.

Much of the data in this study relied on self-reported measures, including questionnaires and journals. This provides valuable insights into participants' experiences but is inherently subjective and may be influenced by desirability bias or inaccurate recall. The self-reported data

may have also been affected by participants' current emotional states at the time of reporting, potentially leading to variability in the data.

The music used during this study was pre-selected, which may have limited the effectiveness of the interventions for some participants, as personal music preferences can significantly influence emotional and psychological responses. Emotional connections to music are often stronger when individuals can select pieces and genres that resonate with their personal tastes and experiences. This limitation suggests the need for future studies to explore the effects of a more personalized approach to music for stress management during pregnancy.

The two-week duration of the study presents a significant limitation in understanding the long-term effects of music interventions on stress management during pregnancy. Although participants noted the benefits of music for stress management in this short time, a longer study that evaluates the long-term effects of music interventions would be beneficial. Additionally, the participants were at varying gestations, so it is possible that the effectiveness of music interventions could vary depending on the stage of pregnancy.

This study offers important insights into how music interventions can positively impact stress levels during pregnancy. However, several limitations must be considered when interpreting the findings. These limitations suggest areas where further research is needed to expand upon the data and conclusions presented in this study. Addressing these constraints in future research will help refine and enhance the effectiveness of music interventions in prenatal care and provide further insights into how music can be effective in stress management during pregnancy.

Recommendations for Future Study

Based on the implications for practice and the limitations previously identified, the researcher proposes several recommendations for future research: expand the sample size and demographics, conduct long-term studies, personalize music interventions, and enhance the reliability of self-reported data.

It is suggested that future studies should include a larger and more diverse sample size. This will enhance the generalizability of the findings, which will help to ensure that the results are applicable to a broader population of pregnant women. By taking into account socio-economic and geographical backgrounds, additional research in this area could positively impact a more diverse population of pregnant women.

Future research studying the benefits of music for stress management during pregnancy would benefit from longitudinal studies that track participants for a longer period of time, potentially throughout their entire pregnancy. This would allow for a better understanding of how sustained music interventions impact stress levels and pregnancy outcomes over a longer period of time. This recommendation for longitudinal studies opens the door for additional studies to understand the broader implications of music interventions, not only during pregnancy but also during labor, birth, and postpartum. It is proposed that longitudinal research could reveal how the consistent use of music interventions during pregnancy could prepare mothers for the emotional demands of childbirth and postpartum, leading to the development of a holistic, musical approach to maternal care that spans pregnancy through motherhood and beyond.

Another compelling area of proposed future research involves the personalization of music interventions. Research demonstrates that music therapy is most effective when patients feel a connection with the music they are listening to. Therefore, it is proposed that allowing

participants to choose or personalize their music interventions during a study could lead to more effective musical stress management strategies. Future studies are suggested to explore the impact of personalized music selection and how it influences emotional and psychological support.

Given the limitations related to self-reported data, it is suggested that future studies should incorporate additional objective methods of measuring stress and anxiety, including physiological markers such as cortisol levels, heart rate variability, and electroencephalography brainwave measurements. A mixed-methods approach that incorporates objective, quantitative data would provide additional understanding of the impact of music on stress management during pregnancy.

Expanding the sample size to include a more diverse demographic, conducting long-term studies to provide insights into the impacts of music on labor, birth, and postpartum, personalizing music interventions to enhance effectiveness, and improving the reliability of self-reported data would strengthen the accuracy and credibility of the findings. Together, these areas of recommendation for future study would contribute to creating a pioneering prenatal music program. This program, supported by robust and comprehensive research, would be unique and ground-breaking in its approach to music for stress management during pregnancy. This proposed program would address current gaps in prenatal care and set a new standard for supporting maternal well-being and enhancing the pregnancy experience through music. By addressing the root causes of stress and providing ongoing support through the prenatal and postnatal periods, this program has the potential to make a meaningful impact on the health and quality of life of pregnant women around the world.

Summary

The purpose of this qualitative hermeneutic phenomenological study was to explore how music interventions influence stress levels during pregnancy and how music interventions can be implemented to positively affect pregnancy experiences. This study aimed to provide a deeper understanding of the role of music as a tool for managing stress during pregnancy, with the objective of offering a holistic and accessible alternative to pharmaceutical treatments. The study also sought to explore how music can serve as an effective, non-invasive, and cost-efficient method to reduce stress and improve overall maternal well-being during pregnancy. The findings of this study affirmed the central research question and sub-questions, demonstrating that music interventions significantly reduce stress levels, enhance emotional and psychological support, and improve pregnancy outcomes by fostering a stronger maternal-fetal bond.

The most significant finding of this study is that every participant reported a noticeable decrease in feelings of stress, anxiety, and depression after incorporating music interventions into their daily routines. Furthermore, all participants expressed their intention to continue using music as a stress management tool throughout their pregnancy and beyond. This universal, positive response among participants affirms the importance of developing a structured prenatal music program for stress management. Such a program would not only fill a critical gap in prenatal care, but also contribute significantly to the field of arts in health by providing a practical, effective, and holistic approach to supporting the mental and emotional well-being of expectant mothers.

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Appendix A

IRB Approval

This study was approved under Liberty University IRB-FY23-24-1256.

Date: 8-18-2024

IRB #: IRB-FY23-24-1256

Title: A Holistic Approach to Music for Stress Management During Pregnancy

Creation Date: 1-27-2024

End Date:

Status: **Approved**

Principal Investigator: Danielle Dixon

Review Board: Research Ethics Office

Sponsor:

Study History

Submission Type	Initial	Review Type	Exempt	Decision	Exempt
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Key Study Contacts

Member	Danielle Dixon	Role	Principal Investigator	Contact	[REDACTED]
Member	Danielle Dixon	Role	Primary Contact	Contact	[REDACTED]
Member	Karen Kuehmann	Role	Co-Principal Investigator	Contact	[REDACTED]

Appendix B

Social Media Recruitment Post



SEEKING RESEARCH PARTICIPANTS

For a study to examine how music interventions impact stress levels during pregnancy.

Principal Researcher: Danielle Dixon, Ph.D. Candidate

Participants must be biological women, 18 years old or older, sixteen to thirty weeks pregnant, and self-identify as experiencing stress, anxiety, or depression during pregnancy.

This study involves:

- Two online questionnaires
- A two-week, 45-minute, in-person group music class
- At home music-listening + journaling

Participants will receive a \$10.00 CAD Amazon gift card upon completion of the study.

To participate, please email Danielle at [REDACTED]

Appendix C

Social Media Recruitment Post Caption

ATTENTION INSTAGRAM FRIENDS: I am conducting research as part of the requirements for a Ph.D in Music Education at Liberty University. The purpose of my research is to examine how music interventions impact stress levels during pregnancy. Participants must be biological women who are sixteen to thirty weeks pregnant, 18 years of age or older, who self-identify as experiencing stress, anxiety, or depression during pregnancy, and must be able to travel to Georgetown, Ontario, to take part in the in-person part of this study. Participants will be asked to respond to an open-ended entrance questionnaire, take part in a two-week in-person music class with an additional daily at-home music listening protocol, respond to weekly journal prompts, and complete an exit questionnaire, which should take about 180 minutes to complete. If you would like to participate and meet the study criteria, please click the LINK IN BIO to see more study information. A consent document is provided below the information. Participants will receive a \$10.00 CAD Amazon gift card upon completion of the study.

ATTENTION FACEBOOK FRIENDS: I am conducting research as part of the requirements for a Ph.D in Music Education at Liberty University. The purpose of my research is to examine how music interventions impact stress levels during pregnancy. Participants must be biological women who are sixteen to thirty weeks pregnant, 18 years of age or older, who self-identify as experiencing stress, anxiety, or depression during pregnancy, and must be able to travel to Georgetown, Ontario, to take part in the in-person part of this study. Participants will be asked to respond to an open-ended entrance questionnaire, take part in a two-week in-person music class with an additional daily at-home music listening protocol, respond to weekly journal prompts, complete an exit questionnaire, which should take about 180 minutes to complete. If you would like to participate and meet the study criteria, please click here: <https://form.jotform.com/240224075487052> to see more study information. A consent document is provided below the information. Participants will receive a \$10.00 CAD Amazon gift card upon completion of the study.

Appendix D

Study Consent

Title of the Project: A Holistic Approach to Music for Stress Management During Pregnancy

Principal Investigator: Danielle Dixon, Doctoral Candidate, School of Music, Liberty University

Invitation to be Part of a Research Study

You are invited to participate in a research study. To participate, you must be

- 18 years of age or older
- a biological woman
- sixteen to thirty weeks pregnant
- self-identify as experiencing stress, anxiety, or depression during pregnancy
- able to travel to Georgetown, Ontario, Canada for two forty-five minute in-person music sessions

Taking part in this research project is voluntary. Please take time to read this entire form and ask questions before deciding whether to take part in this research.

What is the study about and why is it being done?

The purpose of the study is to examine how music interventions impact stress levels during pregnancy.

What will happen if you take part in this study?

If you agree to be in this study, I will ask you to do the following:

1. Respond to an open-ended entrance questionnaire (estimated time to complete: 15 minutes)
2. Take part in a two-week in-person music class (estimated time to complete: 90 minutes)
3. Participate in a daily at-home music listening protocol (estimated time to complete: 40 minutes)
4. Respond to weekly journal prompts (estimated time to complete: 20 minutes)
5. Complete an exit questionnaire (estimated time to complete: 15 minutes)

The total estimated time required to participate in this study is 180 minutes.

How could you or others benefit from this study?

The direct benefits participants should expect to receive from taking part in this study may include stress reduction, improved mood, increased bonding with baby, improved sleep quality, social support, and reduced perception of pain.

Benefits to society include healthier birth outcomes, enhanced child development, reduced healthcare costs, community building and support networks, and decreased pharmaceutical use.

What risks might you experience from being in this study?

The expected risks from participating in this study are minimal, which means they are equal to the risks you would encounter in everyday life.

How will personal information be protected?

The records of this study will be kept private. Research records will be stored securely, and only the researcher will have access to the records.

- Participant responses will be kept confidential by replacing names with pseudonyms.
- Data will be stored on a password-locked computer. After seven years, all electronic records will be deleted.

How will you be compensated for being part of the study?

Participants will be compensated for participating in this study. At the conclusion of the two-week study, once the final exit questionnaire has been received, participants will receive a \$10.00 CAD Amazon gift card. Any participant who chooses to withdraw from the study after beginning but before completing all study procedures will not receive a gift card/etc. Email addresses will be requested for compensation purposes.

Is study participation voluntary?

Participation in this study is voluntary. Your decision whether to participate will not affect your current or future relations with Liberty University. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

What should you do if you decide to withdraw from the study?

If you choose to withdraw from the study, please contact the researcher at the email address included in the next paragraph. Should you choose to withdraw, data collected from you will be destroyed immediately and will not be included in this study.

Whom do you contact if you have questions or concerns about the study?

The researcher conducting this study Danielle Dixon. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact her at [REDACTED] You

may also contact the researcher's faculty sponsor, Dr. Karen Kuehmann, at
[REDACTED]

Whom do you contact if you have questions about your rights as a research participant?

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the IRB. Our physical address is Institutional Review Board, 1971 University Blvd., Green Hall Ste. 2845, Lynchburg, VA, 24515; our phone number is 434-592-5530, and our email address is irb@liberty.edu.

Disclaimer: The Institutional Review Board (IRB) is tasked with ensuring that human subjects research will be conducted in an ethical manner as defined and required by federal regulations. The topics covered and viewpoints expressed or alluded to by student and faculty researchers are those of the researchers and do not necessarily reflect the official policies or positions of Liberty University.

Your Consent

By signing this document, you are agreeing to be in this study. Make sure you understand what the study is about before you sign. You will be given a copy of this document for your records. The researcher will keep a copy with the study records. If you have any questions about the study after you sign this document, you can contact the study team using the information provided above.

I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.

Printed Subject Name

Signature & Date

Appendix E

Journal Prompts

Week 1:

- Twinkle, Twinkle, Little Star:
 - As you listened to and/or sang “Twinkle, Twinkle, Little Star,” did you notice any changes in your feelings of stress or anxiety? Reflect on how this lullaby may have influenced your emotional state and if it provided a sense of comfort as you listened to it throughout the week. Did it evoke any memories or emotions related to your pregnancy journey? Did you experience any sensations while you listened to this song?
 - Consider the concept of maternal-fetal bonding. Do you think listening to/singing “Twinkle, Twinkle, Little Star” contributes to this bonding process? Reflect on any thoughts or observations about how this music may have influenced the connection between you and your baby.
- Kumbaya:
 - As you listened to and/or sang “Kumbaya,” did you notice a sense of calm or connection? Reflect on how this song influenced your feelings of bonding with your baby. Did this song provide a sense of emotional support or relief?
 - Consider the lullaby aspect of “Kumbaya.” How does singing or listening to lullabies impact your stress levels and feelings of well-being?
- Pregnancy Hypnosis:
 - Pay attention to your breathing while listening to this song. How did the music influence your breath and overall sense of relaxation? Did you notice any changes in your breathing patterns (faster, slower, longer breaths, etc.) Did you notice a change in your feelings of stress or tension?
 - Consider the connection between intentional breathing and stress reduction during pregnancy. Did this instrumental song with a focus on free-flowing breathing contribute to your ability to manage stress and anxiety levels?
- Dreamscape Waves (Ocean):
 - When listening to this song, visualize the pattern of waves moving in and out on the shore. Take a deep breath for the crash and receding of the wave and then try to breathe again with the next wave. Try to adjust your breathing as the ebb and flow of the waves crashing change. What sensations or feelings did you notice while listening to this piece? How did this experience affect your mood and stress levels?
 - Consider the impact of incorporating nature-inspired sounds into your prenatal music listening routine. Did the ocean sounds reduce your stress and anxiety levels? If yes, how might this stress reduction positively affect your pregnancy? Share your thoughts on listening to nature-inspired sounds.

Week 2:

- Stay Awake:
 - As you listened to and/or sang “Stay Awake,” did you notice any changes in your feelings of stress or anxiety? Reflect on how this lullaby may have influenced your emotional state and if it provided a sense of comfort as you listened to it throughout the week. Did it evoke any memories or emotions related to your pregnancy journey? Did you experience any sensations while you listened to this song?
 - Consider the concept of maternal-fetal bonding. Do you think listening to/singing “Stay Awake” contributes to this bonding process? Reflect on any thoughts or observations about how this music may have influenced the connection between you and your baby.
- You Are my Sunshine
 - As you listened to and/or sang “You Are My Sunshine,” did you notice a sense of calm or connection? Reflect on how this song influenced your feelings of bonding with your baby. Did this song provide a sense of emotional support or relief?
 - Consider the lullaby aspect of “You Are My Sunshine.” How does singing or listening to lullabies impact your stress levels and feelings of well-being?
- Womb Sounds with Mother’s Heartbeat
 - As you listen to this song, visualize your baby in your womb and imagine the sounds they are hearing. Try taking breath in for 4 heart beats and breathing out for the next 4 heart beats. How did the music influence your breath and overall sense of relaxation? Did you notice any changes in your breathing patterns (faster, slower, longer breaths, etc.,) Did you notice a change in your feelings of stress or tension?
 - Consider the connection between intentional breathing and stress reduction during pregnancy. Did this instrumental song with a focus on rhythmic breathing contribute to your ability to manage stress and anxiety levels?
- Crystal Bowls
 - When listening to this song, consider adding vocalisations using low sounds like “ooooooooo” and “uuuuuuu,” as you feel comfortable. What sensations or feelings did you notice while listening to this piece? How did this experience affect your mood and stress levels?
 - Consider the impact of incorporating instrumental sounds into your prenatal music listening routine. Did the music reduce your stress and anxiety levels? If yes, how might this stress reduction positively affect your pregnancy? Share your thoughts on listening to instrumental sounds.

Appendix F

2-Week Prenatal Stress Management Study

- Music listening is effective in helping pregnant women cope with stress.²³⁴
- After two-weeks of a group music intervention, the music therapy experimental group showed a significant decrease in three self-reported psychological health assessments: perceived stress scale (PSS), state scale of the state-trait anxiety inventory (S-STAI), and Edinburgh postnatal depression scale (EPDS), while the control group only showed a less substantial decrease in the PSS after two weeks.²³⁵
- A two-week music therapy intervention during pregnancy has quantifiable psychological benefits and positively influences stress, anxiety, and depression in pregnant mothers.²³⁶
- Various music interventions, like participating in group music activities (singing or playing instruments), enjoying music, and undergoing music therapy, have demonstrated their effectiveness in alleviating indications of depression and anxiety.²³⁷
- “Music therapy not only lays stress on emotional problems but also enhances positive attitudes toward pregnancy, childbirth, and parenting. Music therapy provides a wide spectrum of evidence-based methods for emotion regulation which apply to pre- and perinatal care.”²³⁸
- At sixteen weeks pregnant, fetuses perceive sounds as distorted whispers, and when played music, they respond with tongue and mouth movements. These are equated with vocalisation attempts and are the first signs of communication development and language learning.

²³⁴ Hsing-Chi Chang et al., “The Effects of Music Listening on Psychosocial Stress and Maternal–Fetal Attachment during Pregnancy,” *Complementary Therapies in Medicine* 23, no. 4 (August 2015): 509–15, <https://doi.org/10.1016/j.ctim.2015.05.002>.

²³⁵ Mei-Yueh Chang, Chung-Hey Chen, and Kuo-Feng Huang, “Effects of Music Therapy on Psychological Health of Women during Pregnancy,” *Journal of Clinical Nursing* 17, no. 19 (October 2008): 2580–87, <https://doi.org/10.1111/j.1365-2702.2007.02064.x>.

²³⁶ Ibid.

²³⁷ Katie Rose M. Sanfilippo, Lauren Stewart, and Vivette Glover, “How Music May Support Perinatal Mental Health: An Overview,” *Archives of Women’s Mental Health* 24, no. 5 (August 28, 2021): 831–39, <https://doi.org/10.1007/s00737-021-01178-5>.

²³⁸ Wolfgang Mastnak, “Perinatal Music Therapy and Antenatal Music Classes: Principles, Mechanisms, and Benefits,” *The Journal of Perinatal Education* 25, no. 3 (2016): 184–92, <https://doi.org/10.1891/1058-1243.25.3.184>.

Week 1:

Time	Activity	Research	Song/Music
10:15am-10:20am	Brief class introduction and overview of the research study.		
10:20am-10:40am	Maternal-fetal Bonding Song / Singing Lullaby	- Interventions aimed at strengthening the maternal-fetal bond may help mothers become more resilient to stress, which, therefore, promotes their well-being during pregnancy. ²³⁹ - When mothers engage sing to their unborn baby, they exchange positive emotions with their unborn baby and increase bonding, which reduces stress. ²⁴⁰ - When pregnant	Twinkle, Twinkle, Little Star Lyrics: V1: Twinkle, twinkle, little star, How I wonder what you are! Up above the world so high, Like a diamond in the sky. Twinkle, twinkle, little star, How I wonder what you are! V2: When the blazing sun is gone, When he nothing shines upon, Then you show your little light, Twinkle, twinkle, all the night. Twinkle, twinkle, little star, How I wonder what you are! Kumbaya – The O’Neill Brothers Lyrics: V1:Kumbaya my Lord, kumbaya Kumbaya my Lord, kumbaya Kumbaya my Lord, kumbaya Oh Lord, kumbaya V2: Someone’s singing Lord, kumbaya Someone’s singing Lord, kumbaya Someone’s singing Lord, kumbaya Oh Lord, kumbayah V3: Someone’s crying Lord, kumbaya Someone’s crying Lord, kumbaya Someone’s crying Lord, kumbaya Oh Lord, kumbaya

²³⁹ Meital Navon-Eyal and Orit Taubman, “Psychological Well-Being during Pregnancy: The Contribution of Stress Factors and Maternal-Fetal Bonding,” *Journal of Reproductive and Infant Psychology*, June 9, 2023, 1–15, <https://doi.org/10.1080/02646838.2023.2222143>.

²⁴⁰ Birgit Arabin and Michael Jahn, “Need for Interventional Studies on the Impact of Music in the Perinatal Period: Results of a Pilot Study on Women’s Preferences and Review of the Literature,” *The Journal of Maternal-Fetal & Neonatal Medicine* 26, no. 4 (November 2012): 357–62, <https://doi.org/10.3109/14767058.2012.733763>.

	mothers listen to music, perform music, and sing, their stress levels are lower, which improves fetal and neonatal development. ²⁴¹	V4:Someone’s praying Lord, kumbaya Someone’s praying Lord, kumbaya Someone’s praying Lord, kumbaya Oh Lord, kumbaya Oh Lord, kumbaya Oh Lord, kumbaya Oh Lord, kumbaya Oh Lord, kumbaya Oh Lord, kumbaya
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10:40am- 10:55am	Womb Soundscape / Rest with Relaxing Music	- Introduce sounds that are developmentally similar to the natural prenatal environment, including simple patterns, similar to the maternal heartbeat. ²⁴² - Listening to music positively affects the autonomic nervous system prompts a faster recovery, and	Pregnancy Hypnosis – Calm Pregnancy Music Academy (Instrumental Only) Listening to music and breathing – this technique can be used throughout pregnancy, when you feel nauseous, stressed, worried, etc., and also during labor and contractions. Instructions before beginning activity: - deep, slow breaths from your abdomen - rest hands at the bottom of your ribs, fingertips touching - fingertips should move apart slightly as you breathe in, and then come together again as your lungs empty - focus on how your hands feel on your tummy as you breathe in and out
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²⁴¹ Birgit Arabin and Michael Jahn, “Need for Interventional Studies on the Impact of Music in the Perinatal Period: Results of a Pilot Study on Women’s Preferences and Review of the Literature,” *The Journal of Maternal-Fetal & Neonatal Medicine* 26, no. 4 (November 2012): 357–62, <https://doi.org/10.3109/14767058.2012.733763>.

²⁴² Marie Thompson, “‘Your Womb, the Perfect Classroom’: Prenatal Sound Systems and Uterine Audiophilia,” *Feminist Review* 127, no. 1 (November 24, 2020): 73–89, <https://doi.org/10.1177/0141778920958671>.

prompts a less severe endocrine and psychological response to a stressor.²⁴³

[Dreamscape Waves \(Ocean\)](#)
(Instrumental Only)

Instructions before beginning activity:

- right now, your baby is hearing a variety of sounds from inside your body, like the inhale and exhale of your breath, the whooshing of the blood running through your veins, the beat of your heart, and even your digestive system! The gurgles and ebbs and flow of your breathing are particularly similar to the sounds of nature, especially water.

- as you listen to the sound of the waves crash in and out in this next song, take a deep breath for the crash and receding of the wave and then try to breathe again with the next wave. try to adjust your breathing as the ebb and flow of the waves crashing change

- this exercise is particularly helpful for when you are in labor and working through contractions – contractions, or sensations, come in waves, and it is helpful to be able to breathe through the waves – some may be longer, some shorter, listen to the sounds and breathe in the way that feels best with your body

10:55am- Class

11:00am conclusion

Hand out lyrics for at-home practice

²⁴³ Myriam V. Thoma et al., “The Effect of Music on the Human Stress Response,” ed. Robert L. Newton, *PLoS ONE* 8, no. 8 (August 5, 2013): e70156, <https://doi.org/10.1371/journal.pone.0070156>.

Week 2:

Time	Activity	Song/Music
10:15am-10:35am	Maternal-fetal Bonding Song / Singing Lullaby	<p>Stay Awake – Lullabies for Daycare</p> <p>V1: Stay awake, don't rest your head Don't lie down upon your bed While the moon drifts in the skies Stay awake, don't close your eyes</p> <p>V2: Though the world is fast asleep Though your pillow's soft and deep You're not sleepy as you seem Stay awake, don't nod and dream Stay awake, don't nod and dream</p> <hr/> <p>You are My Sunshine (Instrumental Version)</p> <p>You are my sunshine My only sunshine You make me happy When skies are gray You'll never know, dear How much I love you Please don't take My sunshine away</p>
10:35am-10:55am	Womb Soundscape Rest with Womb Sounds	<p>Womb Sounds with Mother's Heartbeat (Instrumental)</p> <p>Instructions before beginning activity:</p> <ul style="list-style-type: none"> - the next song might not sound familiar to you, but is similar to what your baby is hearing in your womb right now... let's listen for a moment... - the gurgles could be from your digestive system or the blood rushing through your veins, you also hear a nice steady heartbeat, which is the soundtrack to your baby's life right now! - as you listen to this song, visualize your baby in your womb and imagine the sounds they are hearing - we are going to try some timed counting with this song, so taking a breath in for 4 heart beats, and breathing out for the next 4 heart beats. I will count a long for the first few rounds, and then try to keep up this breathing throughout the song.

- you're welcome to keep your hands in once place on your belly, or feel free to move them around – do what feels best for you!

Crystal Bowls – Live Music
(Instrumental)

Instructions before beginning activity:

- this next exercise will be a bit different than ones we've done in previous weeks – today we will be focusing on adding vocalizations to music, which can be very helpful during labor!
- there are some sounds you can make, like a high pitched “eeee”, which contracts and tightens your pelvic floor – during labor, we want our vocal cords and pelvic floor (which are inter-connected) to be loose and relaxed, so low sounds like “ooooooo” and “uuuuuuuu” help us to achieve this!
- as I play the crystal bowls, I will lead you through a series of vocalizations and we will end with some deep breathing and relaxation

10:55am- Class conclusion
11:00am

Review at-home practice and study conclusion requirements.

Appendix G

Entrance and Exit Questionnaires

Entrance Questionnaire:

1. What is/are your biggest challenge(s) in your pregnancy journey?
2. How do the challenge(s) identified above cause additional stress or feelings of anxiety/depression?
3. What coping techniques are you currently using to deal with feelings of stress, anxiety, and depression?
4. What suggestions have your doctor or midwife suggested to help you cope with stress, anxiety, and depression?

Exit Questionnaire:

1. Did the music treatments help you deal with the challenge(s) you face in your pregnancy journey? If yes, please explain how. If no, please explain why not.
2. What musical coping techniques best help you manage stress, anxiety, and depression?
3. Do you think that music is beneficial during pregnancy? If yes, please explain how. If no, please explain why not.
4. Will you continue to use music as a form of stress management during pregnancy? If yes, which techniques will you employ?