The Effects of Music Therapy and Relaxation Prior to Breastfeeding on the Anxiety of New Mothers and the Behavior State of Their Infants during Feeding

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THE EFFECTS OF MUSIC THERAPY AND RELAXATION PRIOR TO BREASTFEEDING ON THE ANXIETY OF NEW MOTHERS AND THE BEHAVIOR STATE OF THEIR INFANTS DURING FEEDING

By

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The Office of Graduate Studies has verified and approved the above named committee members.
I would like to dedicate this thesis to the memory of my maternal grandmother, Thelma Constance Russell, who provided me with my earliest musical memory. I will always remember sitting with her at my great-grandmother’s baby grand piano and listening to the melodies she would play on those authentic ivory keys. Her everlasting love for her family and her determination to endure the battle of emphysema as long as possible has empowered me to help others in the medical realm of music therapy. In addition, this thesis would not have been possible without the love and support of my parents, Karen Lillian and Thomas Anthony Procelli, to whom a dedication of this endeavor is essential. They have blessed my sister and me with the true meaning of love and family, and they have always encouraged us to pursue our dreams to the fullest extent. My parents are truly exceptional.
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This study examined the effects of music therapy and relaxation techniques with first time mothers who were breastfeeding. Dependent variables were behavior state of the mother during breastfeeding, behavior state of the infant during breastfeeding, the mother’s self-reported perception of anxiety and relaxation during breastfeeding, and the mother’s perception of breastfeeding and her use of music one week post discharge. Subjects were sixty (N=60) women who had chosen breastfeeding as their preferred feeding method for their infant. Between 24-48 hours after giving birth to their infant, subjects were randomly assigned to either an experimental group (N=30) who received music therapy prior to breastfeeding or a no music control group (N=30). Results showed a statistically significant difference between the behavior-state of the mothers during their breastfeeding attempt. The experimental group displayed significantly less anxiety-related behaviors and more behaviors associated with relaxation and comfort. There was no significant difference between the behavior-state of the infants during breastfeeding. Data from self-report surveys revealed that mothers in the experimental music group reported feeling significantly more relaxed and less anxious after breastfeeding in the hospital then did the control group. No significant difference was found between groups based on mothers’ perceptions of breastfeeding one week post hospital discharge. Additional data were collected for further analysis and implications are discussed.
INTRODUCTION

Nurses, doctors, anesthesiologists, housekeeping staff, nutrition/dietary staff, photographers, insurance care providers, birth records staff, lactation consultants, nursing students, audiologists, and nurse technicians are just some of the healthcare providers that attend to a mother during her postpartum hospital stay. In addition, it is probable that visitors throughout her stay may include the baby’s maternal and paternal grandparents, the father of the baby, the mother and/or father’s siblings and their family, other relatives, close friends, and co-workers. Needless to say, a first time mother may be experiencing the joy of her new baby but may also become overwhelmed in a chaotic environment where she receives little rest and is adjusting to her new role as a mother.

During the early postpartum period, a mother’s stress and anxiety levels, as well as her self-perception, greatly influence her risk for postpartum depression (Petrick, 1984). Throughout this vulnerable time, lactation also needs to be established if the mother intends to breastfeed. A relationship between depression and its effect on breastfeeding success has been established, however a need for further research in this area is necessary (Reyes, 1983).

When a mother possesses a positive attitude about breastfeeding, researchers have found that the amount of milk she produces increases and the overall success of her breastfeeding experience is enhanced (Reyes, 1983). Anxiety, however, inhibits the letdown reflex, also known as milk ejection, thus preventing milk from flowing freely from the mother’s breast to the baby (Lauwers, 2000 & McMurry, 1992). Only one successful feeding is necessary for a positive pattern to emerge in future breastfeeding attempts (Reyes, 1983).

A need exists to develop specific interventions in order to decrease anxiety in first time mothers who are breastfeeding (McMurry, 1992). Individual guidance and counseling is recommended for the breastfeeding mother to decrease emotional tension and stress, physical discomfort, and anxiety, and to increase self-esteem and self-confidence (Gruis, 1977 & Lauwers, 2000). Music therapy techniques such as counseling, coping strategies, progressive muscle relaxation, and guided imagery have
successfully been used as interventions for decreasing stress and anxiety in medical treatment (Hanser, 1985; Robb, 2000; Standley, 2000). In addition, behaviors related to stress can be observed and controlled during a session when using music therapy techniques (Hanser, 1985).

Music therapy techniques have been implemented and researched during pregnancy and music therapy-assisted childbirth and revealed positive results regarding stress, anxiety and pain management (Clark, McCorkle, & Williams, 1981; Hanser, Larson, & O'Connell, 1983). Research relating to music therapy with mothers in the early postpartum period is limited to parent training and parent-infant bonding with at risk newborns in the Neonatal Intensive Care Unit (Whipple, 2000).

This study was designed to explore the existing literature regarding first time mothers who are breastfeeding and determine the effects of music therapy techniques as an intervention to decrease anxiety and increase relaxation. It examined the use of music therapy and relaxation techniques prior to breastfeeding on the mothers’ and infants’ behavior states as well as the mothers’ self perceptions of the breastfeeding experience.
CHAPTER 1

Review of Literature

History of Breastfeeding

Human milk has been the predominant form of nourishment for human infants for millions of years. It is not a recent phenomenon that a mother has been able to make a conscious choice whether or not to feed her infant herself. Throughout history, women who decided not to breastfeed would often hire other women whom they called "wet nurses". The hired wet nurses would feed the infant from their own breast. Mothers who chose to have women breastfeed their infants displayed a status of wealth, they were often eager to get pregnant again, or they were interested in quickly recapturing and maintaining their physical appearance. As a result of medicine, technology, and science, the 17th and 18th centuries brought about enormous changes in infant feeding methods. Human milk substitutes such as cow’s milk became easier to feed to an infant through the development of artificial nipples and bottles. The increase in artificial feeding caused a rise in the number of infant deaths and drastic efforts began to focus on improving artificial baby milk rather than providing means to support and encourage mothers to breastfeed. Mothers began to feel liberated and empowered by the ability to make choices regarding how to feed their babies. They were no longer confined to the infant’s continuous needs throughout the first years of life (Lauwers, 2000).

During the middle of the 19th century, industrialized medicine removed many of the dangers associated with childbirth. The labor and delivery process transitioned from the home, where a midwife and female family members were present, to the sterile environment of a hospital. It is believed that this historical change brought advanced medicine and technology but also decreased the mother’s support system, separated mothers from their babies after birth, and interfered with the initiation of breastfeeding (Lauwers, 2000).

Medical professionals in the early 20th century began to question the popularity of artificial milk for babies. The increasing rate to artificially fed babies was altered and in 1921 Julius P. Sedgwick suggested that education during medical school should
dedicate more time to observing and studying breastfeeding than that dedicated to formula making. At the time, the medical community determined that the lack of lactation education and medical awareness were the primary contributing factors to the poor prevalence of breastfeeding (Lauwers, 2000).

**Incidence of Breastfeeding in the United States**

Breastfeeding rates appear to fluctuate depending on the latest trend. Around the 1900’s, more than 50% of infants were breastfed by their mothers, but from the years 1935 through 1975 babies were primarily bottle fed. It is believed that a rise in medicine and technology adversely affected the information and knowledge that grandmothers and mothers passed down to their daughters regarding breastfeeding. Trends reversed again between 1971 and 1981 when the rate of breastfeeding nearly doubled from 24.7% to 57.6% (Gaskin, 1987). In 1978, and again in 1989, the report, *Healthy People 2000*, released by the Department of Health and Human Services, published goals stating that by the year 2000 the number of mothers who exclusively or partially breastfeed their infants will increase to 75% in the early postpartum period and 50% of those mothers will continue to breastfeed at least five to six months later. A movement to promote breastfeeding across the nation followed.

According to the U.S. Department of Health and Human Services (2000), the 1998 reports claimed that 64% of mothers in the United States breastfed in the early postpartum period, 29% continued to breastfeed their infant through at least six months of age, and 16% breastfed their infant for at least one year. These statistics indicated that the rates of breastfeeding were highest among women who were college-educated and who were thirty-five years of age or older. Mothers who had infants with a high risk of poor health and development, mothers under the age of twenty-one, and mothers with low education levels were among the groups with lowest rates of breastfeeding. Between 1988 and 1997, the rate of breastfeeding African American women, of mothers under twenty years of age, and of those with a grade-school education had substantially increased. Ruth and Robert Lawrence (1999) imply that studies confirm the relationship of breastfeeding to demographic factors such as education, social status, and marriage. They further suggest that a mother’s level of education holds a more significant impact on whether or not she breastfeeds than does the mother’s ethnicity. The Ross Laboratories Mother’s Survey, a study that samples all women in
the fifty states, revealed in 1992 an in-hospital breastfeeding rate of 27% among African Americans, 51.7% among Hispanics, and 59.7% among Caucasians. In 1996, the rates for African American women increased to 37.1% and 60.5% for Hispanics (R. & R. Lawrence, 1999). The release of Healthy People 2010 projected goals to reach 75% for mothers who breastfeeding in early postpartum, 50% at six months, and 25% at one year (U.S. Department of Health and Human Services, 2000).

**Infant Nutrition and Development through Breast Milk**

Because everything ingested by the mother passes to her infant during breastfeeding, it is crucial to mention that the baby may experience adverse effects from the mother’s breast milk. If the mother is taking certain medications, exposed to environmental contaminants, or using social toxicants such as alcohol, caffeine, tobacco, marijuana, and other drugs that alter one’s mood the baby will suffer. It is rare that a mother may be instructed by a medical professional not to breastfeed but it occurs in certain circumstances when breastfeeding is dangerous for the baby. Long-term drug therapy, severe illnesses such as congestive heart failure or treatment of cancer through chemotherapy, the human immunodeficiency virus, and Sheehan’s syndrome which prevents the mother from producing milk are all contraindicative of breastfeeding. Women who have active tuberculosis can breastfeed after receiving treatment for at least two weeks (Lauwers, 2000).

When the contraindications mentioned above are not applicable to a mother, the American Academy of Pediatrics claims that breastfeeding is “the ideal method of feeding and nurturing infants” (U.S. Department of Health and Human Services, 2000). Reyes (1983) notes that the composition of breast milk provides an infant with the immunities needed from the mother, the biochemical composition of breast milk is better digested and absorbed by the infant than formula or cow’s milk, and a slower infant weight gain through breastfeeding may provide an overall health benefit for the child. In addition, unidentified proteins from the mother’s milk build up the newborn’s immune system, breast milk provides anti-infective properties, and the mother’s milk is nonallergenic (McMurry, 1992).

Medical resources suggest that breastfeeding, when compared to bottle feeding, decreases the severity of gastrointestinal infections and diarrhea, reduces ear infections such as otitis media (inflammation of the inner ear), and reduces respiratory
infections, digestive infections, pneumonia, and other illnesses in infants (U.S. Department of Health and Human Services, 2000; Lawrence, 1999; Spraycar, 1995; & Lauwers, 2000).

Prevention of these illnesses and infections through breast milk is vital since respiratory distress syndrome among infants was one of four leading causes of infant mortality (death) in 1997. Other leading causes included birth defects, disorders relating to short gestation and low birth weight (LBW), and sudden infant death syndrome (SIDS). During 1997, 28,045 infants died before the age of one in the United States. The overall mortality rate of infants during that year was 7.2 deaths per 1,000 live births; two-thirds of deaths taking place in the neonatal period (28 days after birth) and one-third in the post-neonatal period (infant’s 29th day after birth until age one) (U.S. Department of Health and Human Services, 2000).

For industrialized countries, the twentieth century brought about the rise of antibiotics and advances in pediatric care which greatly decreased the infant mortality rate. The frequency of illness and morbidity (disease) in Third World countries between breastfed and bottle fed infants was drastic. Scrimshaw’s research in Punjab villages from 1955-1959 revealed the death of 950 infants out of 1,000 live births of bottle fed infants and 120 deaths out of 1,000 in breastfed infants. The primary cause of death was diarrheal disease. Additionally, this disease, as well as malnutrition, significantly impacted the lives of bottle fed babies in Sao Paulo when compared to babies who were breastfed (Puffer & Serrano, 1973). A study conducted in Brazil in the year 1987 demonstrated that bottle fed infants had 14.2% greater risk of death from diarrhea and 3.6% greater risk from respiratory infections when compared to breastfed infants who did not receive supplementation. The study also indicated that infants who were partially breastfed were less protected and the formula or cow’s milk added was actually harmful to the infants. The Yale Harvard Research Project in Tunisia followed 1,000 infants from birth to 26 months and reported that infants that were breastfed had fewer infections, allergies, and illnesses. Cunningham studied infants who were formula fed, breastfed at birth and breastfed still at one year. Less illness, specifically serious illnesses, during the first year of life was significantly related to breastfeeding with the protection being greatest during the early months after birth (Lawrence, 1999).

Breastfeeding not only appears to protect against medical illness or infections but other issues as well. A correlation between breastfeeding and sudden infant death
syndrome (SIDS) seems to exist. Investigations show that incidences of SIDS among infants are lower among breastfed infants. Though breastfeeding does not eliminate SIDS, it is considered a risk-lowering factor and according to researchers, it may be a greater risk than putting a baby in a prone sleeping position (Lawrence, 1999). Research as early as 1929, found positive correlations between breastfed infants and their cognitive development. A report found that babies who were breastfed began to walk two months earlier than artificially fed babies (Lauwers, 2000). During breastfeeding, development of an infant’s perceptual and response mechanism is facilitated by skin-to-skin contact with the mother which contributes to early sensory stimulation.

According to literature by the La Leche League (1987), a grassroots breastfeeding support group, breastfeeding enhances facial development in the infant by increasing the use of the cheek muscles and optimizing development of the jaw and teeth. An infant sucks differently upon the mother’s nipple versus an artificial nipple. During breastfeeding an infant is forced to use his or her tongue to move the nipple towards the back of the mouth and against the hard palate. These differences in sucking patterns may contribute to the decreased success in breastfeeding once an artificial nipple from a pacifier or bottle is introduced. The infant often demonstrates confused patterns.

**Breastfeeding Benefits for the Mother**

Breastfeeding is not only the most complete form of nutrition for the infant, but it additionally benefits the health of the mother significantly. Oxytocin, a hormone released during breastfeeding, reduces postpartum bleeding by increasing uterine contractions which control blood loss (Lauwers, 2000). Breastfeeding also increases an earlier return rate to pre-pregnancy weight, reduces the risk of pre-menopausal breast cancer, decreases fertility, and reduces the risk of osteoporosis (Lauwers, 2000; Reyes, 1983; U.S. Department of Health and Human Services, 2000).

Oxytocin and Prolactin both contribute to the emotional health of the mother as well. When released, they cause feelings of relaxation, well-being, and mothering. Therefore, a positive breastfeeding experience can be empowering and increase a mother’s self esteem (Lauwers, 2000). Riordan (1983) suggested that breastfeeding enhances the attachment and bond that the mother has with her infant. Since
attachment does not rely solely on a feeding method, it is important to note that attachment can be achieved between mother and infant without breastfeeding. Research indicates that when breastfeeding, though, the mother-baby bond is enhanced by frequent touching, holding, and eye-to-eye contact. Lauwers (2000) claims that this bond, initiated through breastfeeding, promotes a long lasting attachment and a unique closeness between the mother and her child. The immediate responsiveness of the breastfeeding mother causes the baby to experience instant gratification, thus developing trust and a sense of security with the mother.

Making the Decision to Breastfeed

Previous research has inquired about a mother’s reasons for choosing a particular feeding method for her infant (Reyes, 1983). Eastham, Smith, Poole, and Neligan’s (1976) study revealed that women were influenced by their mothers’ methods of feeding, their knowledge of breastfeeding, socioeconomic status and the opinions and choices of their friends and family. A woman’s satisfaction with her life and the role that she believes she plays has also been shown to impact a mother’s decision to breastfeed (Reyes, 1983). Results from Reyes’s (1983) study of 140 mothers from varying socioeconomic statuses revealed that 87% of women chose their feeding method and made the decision to breastfeed within the first trimester of their pregnancy, 7% made a decision in the second trimester and 5% decided during the third trimester. Sixty-one % of the mothers surveyed claimed their physician encouraged them to breastfeed.

Reamer and Sugarmann (1987) conducted a study with American and Canadian women randomly selected from a volunteer request in a La Leche Newsletter. Average volunteers consisted of La Leche members who were older, educated, predominantly Caucasian, and who weaned their infants from breastfeeding at an average of eighteen months of age. Subjects believed that prolonged nursing provided their children with emotional security, happiness, mutual love, future independence and good health. Only 1.5% of the mothers surveyed reported that they believed there were no positive effects of prolonged nursing (Lawrence, 1999).
Reasons for Not Breastfeeding or Discontinuing Early in the Postpartum

Research indicates that approximately 50% of new mothers give up breastfeeding because they view themselves as being unsuccessful (Johnson, 1976). When interviewed at a prenatal Women Infant and Children (WIC) clinic, women, who were of low income participating in the WIC program, stated they knew that breastfeeding was best for the baby. However, the women believed breastfeeding was too difficult and they felt overwhelmed by rules such as how to prepare the breasts and how to maintain a good diet while breastfeeding. The majority of mothers participating in the study claimed they would breastfeed if their doctor said it was important (Lawrence, 1999).

Similar findings from the Ross Laboratories Mother’s Survey suggested that mothers trusted their physicians’ opinions and they were more likely to breastfeed and have more success if they had support from their doctors (R. & R. Lawrence, 1999). Also in the survey, mothers were able to indicate the reason(s) for discontinuing breastfeeding. The primary reason to stop breastfeeding, reported by 50% of the mothers, was due to an inadequate milk supply. Others factors included: baby being unsettled after feedings (26.7%), very frequent feeding required (25%), breastfeeding was too tiring (17.2%), painful nipples (14.7%), baby refused the breast (12.9%), mom unable to leave house (8.6%), anxiety and lack of confidence (7.8%), breast problems (5.2%), returning to work (4.3%), mom’s dislike of breastfeeding (4.3%), insufficient privacy at home (2.6%), illness of baby (2.6%), jealousy from other children (2.6%), and reduced milk supply from contraceptive pills (1.7%; Lawrence, 1999). Milk supply was also the primary reason that 27% of women discontinued breastfeeding in another study of 400 mothers. Breastfeeding behaviors of the mother were influenced when realizing they had an inadequate milk supply; however, mothers indicated that knowledge of how to produce more milk may have prevented them from discontinuing breastfeeding (Hill, 1991).

Other factors, such as medication and sedation during labor, can influence a mother’s success in breastfeeding. Brazelton (1961) found mothers to be less successful during breastfeeding if they were heavily medicated during labor. Findings validate that newborns sucked at significantly lower rates and pressures and absorbed less nutrients when their mothers received a single dose of obstetric sedation during labor when compared to mothers who received no sedation (Kron, Stein, &
Goddard, 1966). Studies have shown that complications during labor and delivery have a moderate association with self-reported symptoms of depression by mothers and were reported in both the early and later postpartum period (O’Hara & Swain, 1996). Decreased success in breastfeeding was also seen in infants who were exposed to bottle feeding for several days. The infants became less successful during breastfeeding as a result of a diminished interest in sucking at the mothers' breast (Rayes, 1983).

**Predictors of Breastfeeding Success**

Reyes (1983) suggests a discrepancy in breastfeeding literature due to the measurement and meaning of “successful breastfeeding.” Some dependent variables have included the number of days/months the mother breastfeeds and others focus on the mother’s perception of the breastfeeding experiences. Contributing factors affecting data consist of physiological problems with lactation, supplementation of formula to breastfeeding, mother returning to work, environmental concerns, and other circumstances.

A study of 187 women who had the prenatal intention to breastfeed was conducted and women who were at a high risk for not implementing their intentions were identified. Significant predictors included women who had lower confidence in their ability to breastfeed, women with less certainty in their decision to breastfeed, women whose first breastfeeding experience was delayed after the baby’s birth, and those women who did not “room-in” with their baby during the hospital stay. Interventions suggested by the authors of the study consisted of prenatal confidence building, early and continued contact with the infant after birth, guidance before discharge and earlier pediatric follow-ups (Lawrence, 1999). Wiles (1984) found that women in an experimental group who attended a pre-natal education class about breastfeeding reported a significantly higher success rate when breastfeeding one month postpartum then those in the control group who did not attend a class. Reyes (1983) concluded that a strong indicator of stress and negative emotions experienced by the mothers during the postpartum period correlated with the number of times the mothers had to take their infants to the pediatrician due to poor feeding within six weeks after hospital discharge. Data from one study influenced the author to suggest that mothers who are satisfied with and perceive their infants’ behaviors during
feedings to be positive will demonstrate overall success in breastfeeding (McMurry, 1992).

Reyes’s (1983) literature indicates that when a mother verbalizes a positive attitude about breastfeeding, her success at breastfeeding and amount of milk produced is enhanced as opposed to mothers who express negative attitudes or feelings. In addition, mothers who have been found to breastfeed successfully once had a repeated pattern of success in breastfeeding attempts that followed. Reyes discovered that the length of time (days and months) a mother breastfed positively correlated with an early decision during pregnancy to breastfeed, a positive attitude towards breastfeeding, the doctor’s encouragement to breastfeed during pre-natal visits, and an easier labor. A decreased duration of breastfeeding postpartum was correlated with failure to breastfeed the infant immediately after delivery and mothers who received higher scores on a depression scale. The researcher concluded that there is minimal literature exploring the effect of depression on breastfeeding yet it was shown to significantly impact the results of her study. Reyes believes that this area of exploration is necessary since a woman is most vulnerable to depression early in the postpartum period when lactation needs to be established.

**Depressive Symptoms: Pregnancy, Childbirth, and Postpartum**

It is estimated in the United States alone that some form of depression in the postpartum period is experienced by 8% to 26% of women who give birth. Emotional changes that occur after giving birth can range from mild mood disorders, or what is considered having the “blues”, to psychosis. Postpartum depression (PPD), mid-range within these two groups, is most often characterized by unclear symptoms however its onset can be very dangerous for the mother, infant, and other family members (Walker, 2000).

Approximately 80% of mothers experience postpartum “blues”. Because it only lasts for a short period of time, it is believed that little consideration within the health profession has been dedicated to this frequent change occurring in women after giving birth (Ugarriza, 1992). Common symptoms can occur between one and ten days after giving birth and can last up to two weeks. They include crying, melancholy behaviors, mild confusion, irritation, and an unstable mood (Nonacs & Cohen, 1998). More detrimental to a mother’s psychological state is PPD, mostly occurring around the
fourth week post birth but with the possibility of onset anytime during the first year. The incidence of PPD has an estimated low of 8% and a high of 26% in women (Wood, Thomas, Droppleman, & Meighan, 1997). More specific symptoms for PPD include anxiety, irritability, hostility, poor coping skills, little concern for self appearance, inadequate feelings, loss of normal interests, changes in appetite, social withdrawal, crying, and insomnia (Ugarriza, 1992; Wood et al, 1997). Postpartum psychosis, the most severe form of depression following childbirth, happens in 0.1-0.2% of women and is prevalent within two weeks after delivery. The dramatic symptoms include restlessness, irritability, insomnia that leads to disorganized behaviors, lack of concern for infant, depressed mood, hyperactivity, hallucinations and delusions, and possible thoughts of suicide and/or infanticide (Nonacs & Cohen, 1998; Ugarriza, 1992).

Predictors of Depressive Symptoms

Social support plays an important role in whether women are at risk for developing PPD and recent studies indicate that it can, in fact, lower one’s risk of PPD onset. Other predictive factors of PPD, according to research conducted by Walker (2000), include an education of high school only, lack of support from one’s partner, an income of less then $30,000, a fussy baby, a religious difference among partners, and a decreased amount of support than what was originally expected by the mother prior to childbirth. Within the same study, ethnicity, age of mother, marital status, employment, unplanned pregnancy, complications during pregnancy and number of other children, if any, were not significant predictors of PPD. Warner, Appleby, Whitton, and Faragher (1996) however, studied risk factors associated with PPD in a much larger sample of 2,375 women between six and eight weeks postpartum. They found that risk factors associated with PPD did include unplanned pregnancy, unemployment for the mother, unemployment for the head of the household, and not breastfeeding.

Petrick (1984) compiled a list of sixteen factors that were considered risk factors of PPD. They included changes in the mother’s emotions after pregnancy, upset of bodily changes resulting from pregnancy, anxiety, and the mother’s intentions for breastfeeding. Walker (2000) utilized Mercer’s Model of Maternal Role Attainment for her research which again stressed that difficulty breastfeeding and obstetrical complications were factors in depressive symptoms if the mother had perceived
inadequate social support. Similar predictors from another study include life stressors during pregnancy, difficult pregnancy or and/or delivery, marital or relationship difficulties, mother’s perception of little support, history of psychopathology, excessive worrying, anxiety, and mild depression (O’Hara & Swain, 1996). According to literature, the best predictor of PPD in mothers may be a prior history of depression at any time in their lives before the pregnancy, any depressive symptoms during the pregnancy, and evidence of a dysphoric mood during pregnancy (Walker, 2000; Righetti-Veltema et al., 1998; O’Hara et al., 1996; & Beck, 1998).

**Incidence of Depression Postpartum**

The Beck Depression Inventory, a widely used tool in psychiatric research, was first utilized for PPD by Saks, Frank, Lowe, Berman, Naftolin, and Cohen (1985). They also used a Postpartum Questionnaire and a differential Emotions Scale/Adjective Checklist in a sample of twenty women six weeks postpartum. The study revealed that 10% of their subjects were depressed. Whiffen (1988) also used the Beck Depression Inventory, as well as five other tools, in a sample size of 115 women and concluded that 16.5% were diagnosed with PPD. Comparable to these studies, data by Righetti-Veltema, Conne-Perreard, Bousquet, and Manzano (1998) showed that 10.2% of 570 women postpartum with varying social classes and degrees of pregnancy risks were depressed. Additionally, Warner et al (1996) found an incidence rate of 11.8% for their large sample size of 2,375 women. A significantly smaller study of 35 participants between a wide span of six weeks and twelve months postpartum, conducted within the same counties as this study, revealed that 31.5% of participants had characteristics of postpartum depression (Walker, 2000). A meta-analysis was conducted on the rates and risks for postpartum depression in 1996. Fifty-nine studies were included in the analysis with a total number of 12,810 subjects. The overall incidence rate for postpartum depression was 13% and it was concluded that the evaluated time period postpartum, and the method of assessment used, were two variables that caused approximately 25% of the variance in incidence rates across studies (O’Hara & Swain, 1996). Sample sizes and places (geographical location) of subject recruitment for women identified with PPD were two other variances addressed in the literature by other researchers (Walker, 2000).
Effects of Depressive Symptoms

Studies have indicated the possible long term negative effects for mothers experiencing depression (Walker, 2000). Depressed mothers tend to be less affectionate and responsive to their infants, infant-mother bonding is negatively affected through infancy, and an increased rate of physical and verbal aggression towards children is noted. Research shows that children of mothers with PPD display more cognitive and intellectual deficits, behavioral problems, and less positive affect. These issues are still recognizable in the child at age four (Beck, 1998 & 1993). A meta-analysis by Beck revealed a significant correlation between the relationship of the temperament of infants and postpartum depressive symptoms of their mothers. The studies show that the mothers’ perceptions of their infants behaviors (e.g. fussy and difficult behavior, frequent crying, and difficulty in consoling the infant) were directly related to PPD (Walker, 2000).

Prevention of Postpartum Depression

Walker (2000) believes that there are recognizable factors that place a mother at risk for depression, and if identified early, can prevent this potentially devastating condition. She recommends that it is necessary for healthcare professionals to receive education regarding the psychological state of a new mother in order to recognize these attributes and possible risks associated with them. In addition, professionals receiving training would be able to recommend appropriate interventions and support systems for patients thus lowering the overall incidence rate of PPD and preventing unfavorable effects. Ruchala and James (1997) concluded that maternal confidence was heavily influenced by the amount of social support provided to the mother. The risk for PPD is lowered by a higher self esteem and self confidence in handling stressors more positively (Hall, Kotch, Browne, & Rayens, 1996).

Anxiety during the Postpartum Period

Researchers suggest that women during the postpartum period not only experience depression but anxiety as well (Walker, 2000). Stuart, Couser, Schilder, O’Hara, and Gorman (1998) examined the co-morbidity of postpartum anxiety and depression and found that at fourteen weeks postpartum, an incidence of 23.3% for depression and 8.7% for anxiety was evident. At thirty weeks postpartum, the
incidence of depression was 18.7% and 16.8% for anxiety. For the study, the researchers used the Beck Anxiety Inventory, the Beck Depression Inventory, State-Trait Anxiety Inventory and the Edinburgh Postnatal Depression Scale (EPDS). Due to a high correlation between scores on the State-Trait Anxiety Scale and the EPDS, they suggest that the EPDS may be used for screening both depression and anxiety. McMurry (1992) found no significant difference in state anxiety (temporary mood state responding to situational stress) or trait anxiety (a person’s general anxiety level resulting from personality) between mothers who attended a prenatal breastfeeding class and those who did not. She did find a significant correlation between prenatal education classes and the duration that mothers breastfed postpartum.

Graef et al. (1988) conducted a study regarding the concerns of thirty-two mothers who were breastfeeding for the first time. Mothers were followed from their hospital discharge date through one month postpartum and results found that the most frequent concern involved infant feedings. Additionally, 80% of the mothers reported that infant feedings caused anxiety and 39% claimed to be tense, anxious and overwhelmed with the new role of becoming a mother.

Research linking anxiety and changes in maternal behavior due to hormonal problems after childbirth is inconclusive. Though it is a common belief that the two are related, there is no empirical evidence to support the relationship between them according to a literature review by Saturley (1993). McMurry’s (1992) review concluded that postnatal anxiety has been recognized and is common in both first time mothers and in mothers who have had at least one other child and the level of anxiety can be heightened when dealing with infant feedings.

What is Anxiety?

Stuart and Sundeen (1983) describe anxiety as feelings of uncertainty and helplessness as well as apprehension that are scattered and unclear. Other associated emotions include feelings of isolation, alienation, insecurity and inadequacy. Anxiety is theorized is to cause feelings of tension, which activate the autonomic nervous system (Doerr & Jones, 1979). Stimulation of the sympathetic nervous system, triggered by anxiety, results in physiologic and somatic changes such as excitation, decreased concentration, irritability, and a sense of feeling threatened (Murdoch & Newton, 1985). Sims and Snaith (1988) claim that excessive worrying is
frequent when anxiety is prevalent and negative perceptions of small tasks or problems being much larger then they actually are is common.

From time to time, anxiety can be positive for a person when it provides motivation to achieve a goal or solve a problem. On the other hand, anxiety can result in destructive behaviors causing withdrawal, depression, or inability to process information correctly (Smitherman, 1981). Much like depression, anxiety can occur at many different levels and severities. Five levels of anxiety were recorded by Beck, Rawlins, and Williams (1988). The mildest form of anxiety produces increased awareness of one’s environment and a shift in one’s attention toward a different focus. Moderate to severe forms of anxiety can cause difficulty in processing information and problem solving, a more narrowed perspective on various issues, disorientation of time and place, and a belief that outcomes of circumstances will most likely be negative.

The Effects of Anxiety on Mothers and Their Infants

Maternal anxiety is theorized to be the emotions experienced by a mother who either anticipated dissatisfaction with herself or her activities, imagined it, or genuinely experienced it. A narrowed perception and behaviors less effective in mothering are related to higher anxiety levels and can cause unnecessary anxiety in the infant. Infant anxiety decreases the infant’s sense of security and additionally interferes with sucking and swallowing which are essential behaviors for high-quality nutrition (Sullivan, 1953). A study by Nover, Shore, Timberlake and Greenspan (1984) found that mothers who experienced high levels of anxiety during the postpartum period had a high frequency of misperception of their infants’ behaviors during an observed mother-baby playtime. Based on these finding, the authors suggested that intervention is necessary for mothers with anxiety because their misperceptions could hinder the feeding needs of their infants. As a result, the literature available indicates that a mother’s level of anxiety must not only be decreased for her well being and sense of fulfillment, but also for the nourishment and emotional protection of her new baby (Sullivan, 1953).

Maternal anxiety with characteristic emotions such as fear, pain, and fatigue can inhibit the letdown reflex of a breastfeeding mother most likely by the secretion of a hormone known as epinephrine (Lauwers, 2000 & McMurry, 1992). The letdown, also known as the milk ejection reflex, allows the mother’s milk to flow freely within the breast into the ducts therefore making it available to the baby through his suckling
activity. Without letdown, only a third of the mother’s milk is received by the baby and fat contents, which are an important component of nutrition within the milk containing many proteins, are unable to pass through the ducts to reach the baby. As a result, the baby will be malnourished even though it appears that he/she is attaining sufficient milk from the breast (Lauwers, 2000).

Some studies have examined the relationship between maternal stress and the letdown reflex. An effective way to measure the amount of milk produced during a feeding includes the use of a breast pump. One study involved fifty-five mothers of preterm infants who were under stress due to anxiety and fatigue of having their infants in the Neonatal Intensive Care Unit (NICU). Mothers were randomly assigned between 3-5 days postpartum to an experimental and control group. The control group received no intervention. The experimental group received guidance through a twenty minute progressive relaxation exercise by audiotape followed by guided imagery which they were encouraged to listen to daily before expressing milk. After one week, a pumping session occurred at the hospital and the average volume of milk pumped by the experimental group was significantly greater then the volume from those who did not receive intervention (Dewey, 2001).

Another study that Dewey discussed (2001) measured the frequency of oxytocin pulses during breastfeeding and concluded that the pulses were significantly lower in the two groups of mothers who were exposed to noise stress (construction noise) or mental stress (math problems) when compared to a control group who did not receive purposeful stressors by the researchers. Information regarding how the oxytocin pulses were measured was not disclosed by Dewey (2001). Literature by Lauwers (2000), states that a mother can letdown her milk more consistently during feedings if she physically and mentally relaxes and decreases any tension that she may have. Suggestions to ensure that letdown occurs include ample suckling opportunities for the baby to stimulate the breast, choosing a quiet location to breastfeed in, selecting a comfortable sitting or lying position, and setting a routine to begin each feeding. According to breastfeeding experts, making use of these techniques can psychologically condition the mother for letdown.
Anxiety during the Hospital Stay

Gruis (1977) developed a questionnaire that was sent to forty women after a successful and normal pregnancy, labor and delivery. Results indicated that the most frequent concerns of postpartum mothers included returning to their original figure, infant feeding and perceived emotional tension. The majority of mothers also reported that they did not feel their hospital stay prepared them to effectively handle the events that would occur during the postpartum period. Gruis reported that the hospital stay primarily consists of the mother recovering from the birth experience, learning and adjusting to her new role, and a “taking-in” time to absorb many new experiences.

Counseling and Intervention for the Breastfeeding Mother

Gruis (1977) recommended that guidance, focused specifically on the mother’s individual concerns, must be provided to the mother before delivery and continue during the postpartum period in order to decrease her emotional tension. Lauwers (2000) stressed the need for basic counseling techniques to support the breastfeeding mother. She claimed that if a mother can relieve physical discomfort, anxiety and emotional stress and increase her self-esteem and self-confidence with the guidance of a professional, then a mother’s satisfaction will greatly increase and her desire to keep breastfeeding will be enhanced. At the time of publication, McMurry (1992) discussed in her review of the literature that many studies have focused on factors associated with breastfeeding success and the mothers’ perceptions; however, a need to develop specific interventions to reduce the anxiety of mothers who are breastfeeding for the first time exists. She believes that interventions to decrease anxiety will result in a well-adjusted mother and baby and a more positive mother-infant relationship.

Music Therapy: A Therapeutic Intervention for Anxiety

Emotional changes have been evoked in people receiving therapeutic interventions through music therapy (Hanser, 1985). During a music therapy session, stress related problems can be identified, addressed and often solved immediately. Stress-related behaviors can be observed and controlled during a session using music therapy techniques, and coping strategies can immediately be implemented. When using music therapy techniques for addressing anxiety, the effects of music have been measured through physiologic responses, behavioral observations and self reports on
anxiety levels and stress (Hanser, 1985). Standley (2000) conducted a meta-analysis of music research in medical treatment. When anxiety was the dependent variable, results indicated that the music condition was greater than the no-music control condition in cardiac patients (White, 1992; Bonny, 1983; Zimmerman, Pierson, & Marker, 1998; Bolwerk, 1990; Mandle et al., 1990), patients undergoing obstetric treatment (Liebman & MacLaren, 1993; Clark, McCorkle, & Williams, 1981), pediatric surgeries (Chetta, 1981; Caire & Erickson, 1986; Steinke, 1991), burn victims (Miller, Hickman, & Lemasters, 1992), adult surgeries (Moss, 1987; Tanioka et al., 1985; Walther-Larsen, Diemar, & Valentin, 1988; Crago, 1980; Sanderson, 1986; Armatas, 1964; Steelman, 1990), women undergoing cesarean surgery (Stein, 1991), cancer patients (Bailey, 1986), families of hospitalized patients (Livengood, Kiser, & Paige, 1984), chronically ill patients (Levine-Gross & Swartz, 1982), and patients undergoing chemotherapy (Frank, 1985). One study, where the dependent variable was anxiety in dental patients, showed that the music condition was less valuable than a non-music condition (Corah, Gale, Pace, & Seyrek, 1981).

Other studies also demonstrate correlations between music and anxiety. When listening to calming background music, college students who were identified as having high anxiety displayed a decrease in state anxiety (Rohner & Miller, 1980). Similar results by Davis and Thaut (1989) indicated a decrease in state anxiety as well as an increase in relaxation in college students. A statistical difference, however, was only recognized in state anxiety. Measurements of physiological data suggested an increase in arousal of autonomic and muscular activity rather than the hypothesized decrease by the researchers. Strauser (1997) studied the effects of preferred music, pre-selected music and visualization, and silence before and after a chiropractic intervention. She found a significant difference between the preferred music listening group versus the visualization group and the silence group on the pre- and post-test state anxiety inventory and 10-point Likert scale which measured perceived tension. No differences across all groups were found in physiological responses which were measured by blood pressure. Contrary to these results, some studies involving music techniques to decrease anxiety and increase relaxation prior to medical procedures indicate a noticeable decrease in blood pressure (Hamel, 2001; Salemore & Nelson, 2000). Hanser (1985) reports a discrepancy in the research and a lack of correlation between physiological and psychological measurements concerning anxiety and stress.
Music Therapy and Relaxation

A positive way to relieve anxiety, pain, and stress is through relaxation (Hanser et al., 1983). Standley’s (2000) meta-analysis also looks at research that has been conducted with music therapy and relaxation. Significant positive effects of music on relaxation have been observed in patients undergoing open heart surgery (Crago, 1980), in the area of obstetrics (Winokur, 1984), and with neonates (Caine, 1991). Another meta-analysis conducted by Pelletier (2004) confirmed these findings and found that when subjects were under stress, music therapy paired with relaxation techniques was effective in increasing relaxation. Research indicates that females and adolescents benefit the most from music therapy interventions using relaxation (Standley, 2000 & Pelletier, 2004).

Self-reports and behavioral observations of hospice patients during a music therapy intervention suggested that relaxation, physical comfort and perceived control of pain can be increased during a single-session with a music therapist (Krout, 2001). In a review of the literature, Robb (2000) found that clinicians are often combining music with techniques such as progressive muscle relaxation (PMR), a technique used to increase relaxation by tensing and then releasing the muscles of the body in a specific order. Music therapists also use guided imagery (GI). When integrating such techniques for stress management, behavior observations and self-reports indicate that cognitive cues are important elements involved in increasing relaxation and are integrated in both PMR and GI (Scheufele, 2002). Within the last decade, studies have researched the effects of these techniques with patients who experience situational or chronic stress.

Robb, Nichols, Rutan, Bishop, & Parker (1995) conducted a study with twenty pediatric burn patients undergoing surgery. Results showed that subjects who received a music assisted relaxation intervention, when compared to subjects who received standard preoperative interventions, displayed a significant decrease in anxiety levels thus increasing their relaxation. Twelve nurses participated in a study measuring the effects of music, GI, and PMR. All subjects were instructed to listen to a pre-recorded tape, which incorporated all three elements, at least five times per week for three weeks. Results found a significant decrease in circadian amplitude across time as well as entrainment of corticosteroids and temperature rhythms. Since circadian
desynchronization has been shown to induce stress related behaviors and corticosteroids are known as the “stress hormones,” the authors believed that results of this study may imply that a positive relationship exists between music relaxation techniques and physical health. Other documented research supports this theory by demonstrating that listening to music does in fact reduce the release of cortisol in adults who are experiencing stress (Standley, 2000).

**Types of Music for Anxiety Reduction and Relaxation**

When conducting research to alleviate stress and increase relaxation, it is recommended that familiar and patient-preferred music be considered by the researcher (Hanser, 1985). All of the reviewed research with reference to pregnancy, labor and delivery appears to have been conducted solely by recorded music. Research indicates however that live music by a qualified music therapist has a more significant effect on subjects then recorded music. After examining the variables in many studies, the greatest effect is seen when a subject’s preferred music is used during intervention (Standley, 2000). According to a review of relevant music literature by Walworth (2003), a positive correlation exists specifically between relaxation and patient preferred music. When comparing types of music with experimentally induced anxiety amongst three groups, a no-music control group, music from subjects’ preferred genre, and specific songs selected by subjects, there was no statistically significant difference in anxiety levels found between the two music groups who listened to the recorded music. There was, however, a significant difference between both music groups and the control group revealing that anxiety was higher in the group that received no music. Davis and Thaut (1989) suggest that one’s psychological interpretation of the music experience may play a major role in the level of relaxation and enjoyment. Therefore, labeling a piece of music as either “stimulative” or “sedative” is one’s learned perception and the therapist must take into account the person’s individual preference and history associated with the musical selection (Standley, 2003).

**Music Therapy during Pregnancy and Childbirth**

Gonzalez (1989) discussed the positive outcomes of anxiety reduction, relaxation, childbirth preparation, delivery, and pain distraction in music therapy
assisted childbirth programs. Biofeedback was used by Wiand (1997) to show that relaxation was higher in pregnant women who received training with music, relaxation, and Lamaze as opposed to only receiving training in Lamaze and progressive relaxation techniques. During three hours prior to their delivery, mothers participating in another study with music during labor were significantly more relaxed than women not receiving a music intervention as evidenced by self reports. They also reported feeling more personal control during the labor process than did the non-music participants (Browning, 2001). Two studies revealed significant decreases in stress during music therapy-assisted childbirth using pre-selected, patient preferred, recorded music (Clark, McCorkle, & Williams, 1981; Hanser, Larson, & O’Connell, 1983). Clark’s et al. (1981) research demonstrated a statistically significant correlation between music and positive attitudes towards a successful childbirth. Self report scores suggested that experimental subjects who received six music therapy training sessions prior to birth achieved significantly higher “success” scores than the control group. Because of the noticeable correlation, the frequency and length of home practice with music were considered strong predictors of a successful childbirth experience.

A similar study conducted by Hanser et al. (1983) measured tension and relaxation through behavioral observation during labor. Movement throughout the body was rated as relaxed or unrelaxed. Relaxed behaviors included restful body positions, no apparent movement or tightness of body parts, rhythmic breathing, and positive verbalizations. Tightness of body parts, purposeless movements, irregular breathing and negative verbal comments were considered unrelaxed behaviors. Observational data were recorded continuously throughout the labor process. Questionnaires revealed that observed behaviors supported patients’ verbal responses on the effectiveness of music for relaxation from stressors involved in childbirth. One hundred percent of participants reported that during labor they experienced decreased pain while listening to music, greater relaxation, the perceptions that the presence of the music therapist was supportive and beneficial, and increased concentration. Additional data indicated that mean pain responses were statistically greater in the group that did not receive music training. As a result of this study, Hanser (1985) suggested that identification of tension through behavioral observation may be a useful tool to measure stress reduction in future studies.
Liebman and MacLaren (1991) measured state and trait anxiety in adolescents during their third trimester of pregnancy. Nineteen experimental subjects listened to recorded music while they were participating in PMR techniques. Though there were no statistically significant differences between groups across the pregnancy weeks of 28-37, results indicated that less state anxiety was observed in experimental subjects. There was a significant difference revealing that state anxiety was less in the experimental group during weeks 30, 31, 34, 35, 36, and 37 of pregnancy with the greatest differences in weeks 35, 36, and 37. A repeated-measures ANOVA showed there was a statistically significant main effect difference revealing less trait anxiety in the experimental group. The researchers believe that this may have happened because of possible problems with random sampling of their participants.

**Music Therapy Postpartum**

When examining the literature, Whipple (2000) discussed the importance for parents and their children to have opportunities for interaction and establish attachment early in the child’s life. These experiences can not only impact the child’s emotional needs but promote feelings of security and nurturing in the parents benefiting them in times of stress. In the NICU she observed significant differences in parents’ actions and responses to their premature infant as well as differences in the infants' behaviors relating to stress. The music therapist spent approximately one hour in the NICU with each of the ten parents in the music experimental group and taught them the behavioral signs of infant overstimulation and how to avoid it, the suitable way to use music with their premature infant, and multimodal stimulation techniques; a specific researched technique involving auditory, vestibular, and tactile stimulation for the infant. Parent participants in the music group were significantly more responsive and appropriate in their actions towards their infants and their infants displayed significantly less stress behaviors then did the control subjects and their infants. One month after discharge, a follow-up revealed little difference among both groups between the parents’ perception of their interactions with their infants and use of music at home.

Another study in the NICU also found a profound relationship between low infant stress and music. When playing recorded music for experimental subjects as opposed to no music for infants in the control group, Caine (1991) found a significant difference in the daily group mean of observable stress related behaviors in premature babies.
When analyzing data, a strong correlation was found between stress levels in low birth weight premature infants and their length of hospital stay. As a result, Caine speculated that music may help lower stress levels in infants and therefore decrease their total length of stay in the hospital.

Some studies have researched the relationship between infant learning and music during the first year of life and have reported positive results. According to Standley (2003), researchers and professionals recognize that term infants are able to attend to music more intently then any other auditory stimuli after birth. Perhaps this explains the reinforcement potential of music throughout a child’s life.
CHAPTER 2

Method

Purpose

The purpose of this study was to examine the differences between first time mothers who received music therapy and relaxation prior to breastfeeding their infants within 24-48 hours after delivery vs. mothers who received no music therapy intervention in: anxiety levels of mother during breastfeeding measured by a behavior scale, behavior state of infant during breastfeeding, mother’s self-reported perception of anxiety and relaxation immediately following the breastfeeding attempt, and mother's perception of breastfeeding and her use of music one week (7 days) post discharge.

Design

The design of this study was a two-group, experiment and control, post-test design with random assignment of subjects. The independent variable was music therapy paired with relaxation techniques, and the dependent variables consisted of behavior state of the mother during breastfeeding, behavior state of the infant during breastfeeding, the mother’s self-reported perception of anxiety and relaxation during breastfeeding, and the mother’s perception of breastfeeding and her use of music one week post discharge.

Subjects

Before the study began, approval was acquired from both the Human Subjects Committee at The Florida State University (see Appendix A) and the Internal Review Board at Tallahassee Memorial HealthCare (see Appendix B). Subjects consisted of sixty (N=60) women in-hospital who had just delivered their first child and had the intention to breastfeed. Appropriate subjects for the study were identified and recruited from the hospital’s daily census and the baby cardex which was located at the nurses’ station. The baby cardex provided the necessary information for recruitment such as the baby’s birth date and time, mother’s age and name, number of times mother had
been pregnant and how many children she gave birth to, the mother’s feeding preference for her infant, and any maternal or infant complications during birth that may have excluded them from the study. Patients who met the study criteria were visited in their hospital rooms by the researcher during the 24-48 hour period after their delivery. Patients were told about the study and were given the option to participate. When a subject agreed to participate, an estimated time of the baby’s next feeding had to be predicted by the mother. The researcher then came back around the predicted time. However, the subject was given the researcher’s pager number in case the baby became aroused and showed signs of hunger before the predicted time. When the mother was ready to breastfeed and the researcher was present, consent (see Appendix C) from the participant was obtained before data collection began.

Subjects were randomized into a control and experimental group according to the day they were observed by the researcher. Each date throughout the duration of the study was randomly labeled beforehand as a control day or experimental day. Participants agreed to the study knowing that they could be in either the experimental group receiving music or the control group that would not receive music to prevent any biases in the study. Table 1 lists the demographics of subjects according to age, race, type of delivery and the gender of their baby.

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**Procedure**

Experimental subjects received music therapy and relaxation prior to breastfeeding their infant. The duration of the music therapy session was dependent on the infant’s behaviors and mother’s concerns regarding the baby. Because a newborn is sleeping the majority of the time after birth, it is critical that the infant feeds when he or she is alert and/or displaying signs of hunger (i.e. sucking, moving tongue inside mouth, opening eyes, fussing, etc.). Therefore, a minimum duration of 10 minutes of music therapy was required for the study and after that time the researcher continued the music intervention until the mother verbalized her desire to start breastfeeding. There was no maximum time limit of music therapy intervention. Mothers who began breastfeeding before 10 minutes of music, however, were excluded from the study.

This study focused on the mother’s individual needs before breastfeeding with an overall goal of decreasing anxiety and increasing relaxation. Therefore, upon the start of the session, subjects were instructed to do what is comfortable and relaxing for them. Mothers were able to choose if they wanted to hold their infants, put them in the crib, interact and/or talk with their spouse, friends, or family, or close their eyes. All experimental subjects were asked to turn off their television by the researcher in order to focus their attention on the musical component.

Live music was sung by the researcher and played on a classical guitar. At the beginning of the session subjects were asked their music preference according to music genres, particular artists, or favorite songs. During the music therapy intervention, subjects engaged in active listening, relaxation techniques (breathing and releasing tension of muscles), and counseling techniques. When the mother verbalized her readiness to breastfeed the music ceased and observation began. The length of the music therapy session was documented for data purposes.

**Data Collection**

Both experimental and control subjects were observed during their breastfeeding attempt with their infant. The researcher observed from a corner in the room where she was able to see the mother and the infant clearly, yet not interfere in their breastfeeding attempt. The researcher remained quiet throughout the entire attempt and only talked when addressed by the mother in order to prevent impoliteness. Since this is a very
personal and meaningful experience for the patient and their families, subjects often included the researcher in their conversations. If a lactation consultant or nurse was present during the breastfeeding attempt, the researcher took note of their presence to include in the results of the study. Participants were not removed from the study based on the presence of a lactation consultant or supporting nurse.

Behavioral observations of the infant (adapted from Whipple, 2004) and of the mother were recorded by the researcher every thirty seconds (see Appendix D). Data collection began the moment the mother put the infant up to her breast to initiate breastfeeding and discontinued when the mother took the infant off her breast and verbalized she had completed breastfeeding. The length of the breastfeeding attempt was recorded and a feeding score was given to each infant dependent on the quality of their feeding (see Appendix E). All mothers independently completed a survey immediately following their breastfeeding attempt (see Appendix F). Survey questions were answered using a 7-point Likert scale and were exactly the same for both groups with the experimental group having additional questions regarding their perception of the effectiveness of music therapy. A follow up survey (see Appendix G), also using a 7-point Likert scale, was administered one week post discharge via phone for all subjects. Again, both groups received exactly the same questions with the exception of additional questions for the music group.

Any other data (see Appendix H) used in this study was collected from the census, baby cardex, and patients' medical charts. Information collected from these sources included age, race, type of delivery, and gender of baby.
CHAPTER 3

Results

An initial N of 62 was reduced to 60 after all data collection. Two music subjects were removed from the study for not meeting the minimum requirements of music therapy intervention. The two mothers verbalized their readiness to breastfeed prior to receiving at least ten minutes of music therapy. The mothers’ desires always took precedent over any aspect of the study. In addition, one experimental subject was not available for a post-post test one week after hospital discharge due to disconnection of the telephone number she provided to the researcher. Therefore, her in-hospital data were used in this study but the post-post test was not included in analysis.

A mean behavior score was given for each mother dependent on the observations during her breastfeeding attempt. A t-test was conducted between groups on the mothers’ behavior score. The music group had significantly less anxiety-related behaviors \( t = -7.37, df = 58, p < .00 \) than the control group. A post-test score was given to each subject by adding all the questions on the post-test survey together. The highest possible score was 42. These scores were also analyzed and a t-test between groups revealed that the music group reported significantly higher levels of comfort and relaxation during their breastfeeding experience \( t = 3.353, df = 58, p < .001 \) than the control group. Additionally, each post-test question was examined between the groups with a t-test.

Table 2 displays two questions from the music group’s post test survey \( n=30 \) regarding music therapy. For both questions the mean was greater then 6 when a score of 7 was the highest and most positive rating possible on a scale from 0 - 7. Four subjects from the music group and four subjects from the control group discontinued breastfeeding on or before the 7th day after discharge from the hospital. See Table 3 for the type of milk the mothers chose to feed their babies and see Table 4 for the reasons the mothers from both groups discontinued breastfeeding. As a result, music data collected from the post-post test excluded the four mothers who discontinued breastfeeding, four mothers that did not use music at all once they went home, and the
one mother who was unable to be reached. An N of 21 is displayed in Table 5 and their perception of music at home and the use of music at home from the post-post test survey is revealed. The mean score was greater then 4 on all questions and the rating scale remained the same as it was for the post test.

<table>
<thead>
<tr>
<th>Questions</th>
<th>Mean Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of relaxation after listening to music in the hospital</td>
<td>6.7</td>
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<tr>
<td>Interest in listening to music again before breastfeeding</td>
<td>6.3</td>
</tr>
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</table>

Table 2
Post Test Music Questions (N=30)

<table>
<thead>
<tr>
<th>Discontinued within 7 days post discharge</th>
<th>Music</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chose to bottle feed with formula</th>
<th>Music</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>4</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Chose to bottle feed with pumped breast milk</th>
<th>Music</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
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Table 3
Number of Subjects who Discontinued Breastfeeding and their Chosen Feeding Preference (N=8)

<table>
<thead>
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<th>Reason</th>
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<tr>
<td>Latching Problems</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Breast Surgery</td>
<td>✓</td>
<td>✓✓</td>
</tr>
<tr>
<td>Mom and Baby did not “Click”</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Pain</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Milk Ejection “Letdown”</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Desire to measure baby’s intake</td>
<td>✓</td>
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</table>
Table 5
Post-Post Test Music Questions
7 days post discharge (N=21)

<table>
<thead>
<tr>
<th>Questions</th>
<th>Mean Score</th>
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<tbody>
<tr>
<td>Use of music at home before or during breastfeeding</td>
<td>4.6</td>
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<tr>
<td>Comfort level when listening to music during breastfeeding experiences</td>
<td>6.4</td>
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<tr>
<td>Comfort level of music and breastfeeding versus no music and breastfeeding</td>
<td>6.1</td>
</tr>
<tr>
<td>Level of relaxation when listening to music at home</td>
<td>6.5</td>
</tr>
<tr>
<td>Response of baby when using music versus no music</td>
<td>5.1</td>
</tr>
<tr>
<td>Intention to continue using music</td>
<td>6.2</td>
</tr>
</tbody>
</table>

Though the means were slightly different, there was no differentiation by group on: the baby’s behavior score (music mean = 1.653, control mean = 1.691), baby’s feeding score (music mean = 2.77, control mean = 3.07), post-post test scores (music mean = 5.57, control mean = 5.46), and breastfeeding attempt time (music mean = 18 minutes, control time = 21 minutes).

As mentioned previously, some mothers had a lactation consultant (LC) present during their breastfeeding attempt. Table 6 reveals the number of mothers in each group who had a LC come into their room and interact in any way with them or their babies during the observed breastfeeding session. Length of time the LC was present was not used for this study.

Table 6
Number of subjects who had a Lactation Consultant

<table>
<thead>
<tr>
<th></th>
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<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lactation Consultant</td>
<td>12</td>
<td>11</td>
</tr>
<tr>
<td>No Lactation Consultant</td>
<td>18</td>
<td>19</td>
</tr>
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</table>

Pearson’s Correlation was used to analyze the data within each group. When applied to the music group (see Table 7), there was a significant negative correlation between the mothers’ behavior state (MBS) and the presence of a LC. The presence of
a LC also showed significant negative correlations with mothers’ post test perceived comfort, as well as, their perceived relaxation. A significant positive correlation was noted between the length of time the subjects received music therapy and the amount of time the mothers attempted to feed the babies. Additionally, the amount of time the mothers breastfed for showed a significant positive correlation with the babies’ feeding score. Other significant positive correlations existed between the length of music therapy and mothers’ post test perception of the breastfeeding experience, between post test anxiety ratings and post-post test relaxation ratings, and among post test relaxation and post-post test comfort ratings.

When Pearson’s Correlation was used to analyze data in the control group (see Table 8), significant negative correlations were seen among the mothers’ behavior state and the presence of a LC and between subjects’ age and post-post anxiety ratings. Delivery type showed negative correlations with the amount of time the mothers attempted to breastfeed and mothers’ post-post test comfort levels. Positive correlations existed between the mothers’ comfort level and the babies’ feeding score and among the mothers’ race and post test anxiety ratings.
Table 7
Music Group Correlations

<table>
<thead>
<tr>
<th></th>
<th>MBS</th>
<th>LC</th>
<th>MT</th>
<th>BFA</th>
<th>FS</th>
<th>PBE</th>
<th>PR</th>
<th>PC</th>
<th>PR - Home</th>
<th>PC - Home</th>
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<tr>
<td><strong>Mother’s Behavior Score (MBS)</strong></td>
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<td></td>
</tr>
<tr>
<td>Pearson Correlation Sig. (2-tailed)</td>
<td>1.00</td>
<td>.541**</td>
<td>.253</td>
<td>.302</td>
<td>.216</td>
<td>.330</td>
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<td>-.026</td>
<td>-.096</td>
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<td>1.00</td>
<td>-.571**</td>
<td>-.240</td>
<td>.112</td>
<td>-.231</td>
<td>.375*</td>
<td>.367*</td>
<td>.211</td>
<td>.119</td>
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<td>.410*</td>
<td>.190</td>
<td>.369*</td>
<td>.003</td>
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<td>-.402*</td>
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<td>.562*</td>
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<td>.453*</td>
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</table>

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).
<table>
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<th>MBS</th>
<th>LC</th>
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<th>FS</th>
<th>Age</th>
<th>Race</th>
<th>Delivery</th>
<th>PC</th>
<th>PA</th>
<th>PC - Home</th>
<th>PA - Home</th>
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<tr>
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<td>-0.206</td>
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<td>-0.181</td>
<td>-0.554**</td>
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<td>-0.475*</td>
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**. Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).
CHAPTER 4

Discussion

Positive results from this study pave the way for future research in the area of music therapy and breastfeeding in the early postpartum period. A t-test revealed that music played a significant role in the behavior state of the mothers. As a result, mothers who received music therapy displayed less anxiety related behaviors and more relaxed behaviors. Data showed that music mothers smiled more, talked to their infants more, made more pleasure related sounds and laughed more during their breastfeeding attempt than did the mothers who did not receive music. Previous studies have shown that an increase in the mother’s satisfaction with her breastfeeding experience will enhance her desire to keep breastfeeding (Reyes, 1983; Lauwers, 2000). Music therapy allowed the mother to have at least ten minutes of time exclusively for her and her baby, with the absence of medical personnel, to prepare for the breastfeeding experience and reflect on herself, her baby, and the joy of becoming a new mom. Prior research indicated that setting a routine and performing it before each breastfeeding experience can prepare the mother and enhance her milk production (Lauwers, 2000). During the music therapy, many moms displayed positive emotional responses as evidenced by crying, smiling, and laughing, and talking about personal life events. This enhanced bonding with their new baby as well as with a spouse if one was present. According to another t-test, the mothers’ in the music group perceived themselves to be more comfortable and relaxed than did the control group thus further supporting the observational data collected by the researcher.

All thirty music subjects had the opportunity to rate their self perceived relaxation after listening to the music on the post test. The group’s average was 6.7 with the highest rating on the scale being a 7. Music therapy was clearly perceived as enjoyable and relaxing by all music subjects and an intervention that they would be willing to try again. Twenty-four mothers continued to use some form of music independently during breastfeeding when they went home. Mothers were not provided with a structured way to use music at home by the researcher therefore data relating to
the specific use of music at home may be less reliable considering the many possible variances. Future studies involving music therapy and breastfeeding support groups may be designed to provide more reliability and accurate data through take home checklists, record sheets, and daily conversations via telephone between each mother and the researcher.

There were no differences between the control group and the music group in their decisions to discontinue breastfeeding. Reasons for discontinuing however were comparable to reasons found by prior researchers (Hill, 1991; Lawrence, 1999). Three mothers had prior breast surgery, either reduction or enhancement, and discontinued because they were unable to breastfeed or pump breast milk. Interestingly though, the remaining three music subjects who did not have breast surgery chose to pump milk whereas the other two control subjects who also did not have surgery decided to formula feed.

No significant differences existed between the babies’ behavior state during breastfeeding and the babies’ feeding score. These results show that music was in no way detrimental to the baby. Information from discussion with the lactation consultants in the hospital suggested that within the first two days after birth, babies are very sleepy and their feeding patterns are irregular. When in the womb, babies are active during night and sleeping during the day, therefore they may initially have better quality feedings during the night. This may explain why babies from both groups primarily showed behaviors of quietly sucking and sleeping even though their mothers’ behaviors varied greatly. The non-significant results from the study indicate that music used to decrease the mothers’ anxiety did not put their babies to sleep or decrease their quality of feeding. Observations, during the study, suggested that babies’ behaviors were more anxiety related (i.e. fussing and crying accompanied by change in body posture) when they were hungry and trying to breastfeed but latching onto the mother’s breast was unsuccessful due to the inexperience of the mother or baby’s pre-maturity and poor neurological development.

As mentioned earlier, mothers were able to have a LC present during the study if that was their intention, but the researcher did not control for this variable. However, randomization of the study appeared to take care of this situation favorably because the number of subjects in each group who had a LC was very similar across both groups. Surprisingly, significant correlations revealed that in both groups, the presence
of the LC increased the mother's anxiety related behaviors, but it only increased their perceptions of higher comfort and relaxation levels following breastfeeding in the music group. These results suggest that the presence of a LC may be more stressful for mothers. Based on observations, the researcher believes this may be caused by increased talking between LC and mother, increased movement and re-arrangement in mothers' body posture guided by the LC, and mothers' having less physical and psychological control over breastfeeding their infants. Though the presence of the LC increased anxiety related behaviors, it is important to recall that overall music therapy decreased these behaviors. Because results statistically indicated that the music group showed significantly less anxiety related behaviors, and a correlation existed between the presence of a LC and the mothers' perception of a positive experience only in the music group, the combination of instruction from a LC and techniques guided by a music therapist for anxiety reduction and relaxation may be the most beneficial for some mothers. Future research in this area is strongly recommended.

Though there was no significant difference between the length of time the mothers' attempted to breastfeed between groups, within the music group mothers who received a longer music therapy session ended up breastfeeding for a longer amount of time and their perceptions of their experience were more positive. Music group correlations also suggested that infants who fed longer received a higher feeding score. Further data suggested that mothers’ anxiety of breastfeeding when in the hospital significantly influenced their level of perceived relaxation with breastfeeding one week after hospital discharge. This reiterates the possible effects that anxiety can have on comfort and relaxation thus influencing the mother's desire to keep breastfeeding.

It is important to note that control group correlations provided this study with attention-grabbing results regarding demographic information. According to race, African American mothers reported having less anxiety about breastfeeding than Caucasian mothers while in the hospital. When looking at age, younger mothers reported having greater anxiety about breastfeeding than older mothers seven days post hospital discharge. And similar to prior studies (Brazelton, 1961; Kron, Stein, & Goddard, 1966) mothers who had a cesarean section breastfed for a significantly shorter amount of time then mothers who had a vaginal delivery, and they reported being less comfortable with breastfeeding seven days post discharge as well. Since
demographic correlations were significant only in the control group, these results suggest that music therapy transcended all other demographics that may have influenced the success of breastfeeding.

In general, hospitals are interested in providing their patients with optimal comfort and care. This is evident through efforts to gather patients’ perceptions through satisfactions surveys before discharge and continuous efforts to improve health care for women. Facilities are continuing to grow and services available are therefore increasing. Since medical literature claims that breast milk is the most beneficial form of nutrition for a newborn (U.S. Department of Health and Human Services, 2000), lactation must be a primary concern of medical facilities. Research shows that mothers who are better adjusted to this new experience, who have a higher self esteem and confidence when breastfeeding, and who are more relaxed will be more successful in future breastfeeding attempts. Thus, their risk for postpartum depression and anxiety related disorders will be decreased. According to McMurry (1992) the need for therapeutic intervention exists in the medical realm for women who are breastfeeding. The outcome of this study reveals that music therapy offers a therapeutic intervention that reduces the anxiety of first time mothers who are breastfeeding in the early postpartum period and increases their overall sense of well-being.
APPENDIX A

Human Subjects Committee Approval
Office of the Vice President For Research  
Human Subjects Committee  
Tallahassee, Florida 32306-2753  
(850) 644-6633 - FAX (850) 644-4392

APPROVAL MEMORANDUM

Date: 12/15/2004

To: Danielle Procacci  
2397 Emerald Ridge Loop  
Tallahassee FL 32303

Dept.: MUSIC SCHOOL  

From: John Tomkowiak, Chair

Re: Use of Human Subjects in Research  
The effects of music therapy and relaxation prior to breastfeeding on the Anxiety of  
new mothers and the behavior state of their infants during feeding

The forms that you submitted to this office in regard to the use of human subjects in the proposal  
referenced above have been reviewed by the Human Subjects Committee at its meeting on  
12/8/2004. Your project was approved by the Committee.

The Human Subjects Committee has not evaluated your proposal for scientific merit, except to weigh  
the risk to the human participants and the aspects of the proposal related to potential risk and  
benefit. This approval does not replace any departmental or other approvals which may be required.

If the project has not been completed by 12/7/2005 you must request renewed approval for  
continuation of the project.

You are advised that any change in protocol in this project must be approved by resubmission of the  
project to the Committee for approval. Also, the principal investigator must promptly report, in  
writing, any unexpected problems causing risks to research subjects or others.

By copy of this memorandum, the chairman of your department and/or your major professor is  
reminded that he/she is responsible for being informed concerning research projects involving  
human subjects in the department, and should review protocols of such investigations as often as  
needed to insure that the project is being conducted in compliance with our institution and with DHHS  
regulations.

This institution has an Assurance on file with the Office for Protection from Research Risks. The  
Assurance Number is IRB00000446.

cc: Jayne Standley  
HSC No. 2004.842
APPENDIX B

Internal Review Board Approval
December 27, 2004

Danielle Procelli, MT-BC
2397 Emerald Ridge Loop
Tallahassee, FL 32303

Dear Ms. Procelli:

I have reviewed your research project entitled “The Effects of Music Therapy and Relaxation Prior to Breastfeeding on the Anxiety of new Mothers and the Behavior State of Their Infants During Feeding”.

I find that the study meets the criteria for an Expedited Review and upon receipt of this letter you may proceed with your study at Tallahassee Memorial HealthCare.

Please provide a copy of your results to the Medical Staff Office at Tallahassee Memorial HealthCare so that the results can be archived and presented to the Institutional Review Board.

Sincerely,

Richard I. MacArthur, M.D., MS
Vice President/Chief Medical Officer
Administrative Liaison/IRB
APPENDIX C

Informed Consent
I freely and voluntarily and without element of force or coercion, consent to be a participant in the research project entitled “The Effects of Music Therapy and Relaxation Prior to Breastfeeding on the Anxiety of New Mothers and the Behavior State of Their Infants During Feeding.”

This research is being conducted by Danielle Procelli, MT-BC, who is a master’s student at the Florida State University under the direction of Jayne Standley, PhD, MT-BC. I understand the purpose of her research project is to better understand the effects patient-preferred music has on breastfeeding. I understand that if I participate in the project I will receive one session of live music for fifteen minutes and be directed in deep breathing techniques before breastfeeding. I understand that this music therapy session will occur within 24-48 hours of giving birth.

I am aware that immediately after the music the researcher will observe my behaviors and my infant’s behaviors for the entire duration I breastfeed, neither my name nor my infant’s name will be on data forms, and that my infant and I will be identified by subject number only. I understand my medical chart will be reviewed for demographic information and any medical history related to my current hospital stay only. I also understand that my infant’s medical chart will be reviewed to note any medical history since birth as well as my infant’s weight from birth to discharge. I also understand I will be asked to complete a short survey after breastfeeding and asked to freely provide my home phone number in order to answer a short survey one week after being discharged from the hospital. My name will not appear on any of the results. No individual results will be reported, only group findings will be reported. The information will be reviewed by the researcher and her directing professor only and will be kept confidential and secured in the music therapy clinical office to the extent allowed by law. All data will be destroyed by December 31, 2005.

I understand there are minimal risks involved in participation of this study. I understand there is a possibility for me to find music irritating while preparing to breastfeed.

I also understand there are benefits for participating in this research project. I may find breastfeeding my infant to be more pleasant after listening to live music. I understand the information collected during the study may aid health care professionals and new mothers with valuable insight into improved conditions for breastfeeding.

I understand my participation is completely voluntary. I may choose not to participate, or I may withdraw from participation at any time without prejudice, penalty, or loss of benefits. I have been given the right to ask questions concerning this study. Questions, if any, have been answered to my satisfaction.

I understand I may contact Danielle Procelli or Jayne Standley, (850) 644-4565, for answers to questions about this research. Further information is available by contacting the Florida State University Office of Research at (850) 644-8693. Group results will be made available to me upon my request.

I have read and understand this consent form in its entirety.

__________________________   ___________________________
Subject      Date
Informed Consent
Control Group

I freely and voluntarily and without element of force or coercion, consent to be a participant in the research project entitled “The Effects of Music Therapy and Relaxation Prior to Breastfeeding on the Anxiety of New Mothers and the Behavior State of Their Infants During Feeding.”

This research is being conducted by Danielle Procelli, MT-BC, who is a master’s student at the Florida State University under the direction of Jayne Standley, PhD, MT-BC. I understand the purpose of her research project is to better understand the effects patient-preferred music has on breastfeeding.

I am aware that within 24-48 hours after I give birth the researcher will observe my behaviors and my infant’s behaviors while I breastfeed, neither my name nor my infant’s name will be on data forms, and that my infant and I will be identified by subject number only. I also understand that my infant’s medical chart will be reviewed to note any medical history since birth as well as my infant’s weight from birth to discharge. I also understand I will be asked to complete a short survey after breastfeeding and asked to freely provide my home phone number in order to answer a short survey one week after being discharged from the hospital. My name will not appear on any of the results. No individual results will be reported, only group findings will be reported. The information will be reviewed by the researcher and her directing professor only and will be kept confidential and secured in the music therapy clinical office to the extent allowed by law. All data will be destroyed by December 31, 2005.

I understand my participation is completely voluntary. I may choose not to participate, or I may withdraw from participation at any time without prejudice, penalty, or loss of benefits. I have been given the right to ask questions concerning this study. Questions, if any, have been answered to my satisfaction.

I also understand there are benefits for participating in this research project. I understand the information collected during the study may aid health care professionals and new mothers with valuable insight into improved conditions for breastfeeding.

I understand I may contact Danielle Procelli or Jayne Standley, (850) 644-4565, for answers to questions about this research. Further information is available by contacting the Florida State University Office of Research at (850) 644-8693. Group results will be made available to me upon my request.

I have read and understand this consent form in its entirety.

__________________________   ___________________________
Subject      Date
APPENDIX D

Behavioral Observations during Breastfeeding: Mother and Infant
## Behavioral Observations during Breastfeeding – measured every 30 seconds

| MT Start Time: ______ | MT Stop Time: ______ | Observation Start Time: ______ | Observation Stop Time: ______ |

**Feeding Score:** 0 1 2 3 4  
**Lactation Consultant/Nurse:** Yes______ No______

### Mom

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<td>- Smiling - Positive Facial Affect - Pleasure Sounds - Talking with Infant - Eye Contact</td>
<td>- Closed eyes - heavy breathing/snoring - sleeping</td>
<td>- Talking with Lactation Consultant about Strategies - Talking with family, friends or spouse</td>
<td>Restlessness - No Facial Affect</td>
<td>- Muscle Tension</td>
<td>- Negative Verbal Comments</td>
<td>- Crying - Hesitation</td>
<td>Unwillingness/Refusal to continue feeding Infant</td>
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APPENDIX E

Infant Feeding Scale

0 – Baby Sleeping
   Baby made no attempt to latch
   Mom did attempt to stimulate baby to feed

1 – Baby attempted to reach nipple and latch
   Unable to latch successfully to feed

2 – Baby sucking inconsistently
   Continuous re-latching was necessary

3 – Sucking inconsistently and re-latching was necessary
   Sucking became consistent and re-latching decreased

4 – Sucking was very consistent throughout duration of feeding
   Few re-latches were necessary
APPENDIX F

Self Report, Post-test Survey
Self Report - Experimental

Please rate your following experiences by circling the appropriate number on the scales below:

❖ During this breastfeeding experience with my infant, I felt...

0-----1-----2-----3-----4-----5-----6-----7
(not comfortable)       (very comfortable)

❖ Compared to previous breastfeeding experiences, this experience was...

0-----1-----2-----3-----4-----5-----6-----7
(not comfortable)       (very comfortable)

❖ Right now I feel...

0-----1-----2-----3-----4-----5-----6-----7
(not relaxed at all)       (very relaxed)

❖ I have previously been anxious about breastfeeding...

0-----1-----2-----3-----4-----5-----6-----7
(very anxious)       (not at all)

❖ I am anxious about breastfeeding in the future....

0-----1-----2-----3-----4-----5-----6-----7
(very anxious)       (not at all)

❖ My baby responded more positively during this experience than previously...

0-----1-----2-----3-----4-----5-----6-----7
(no difference or less)       (much more positive)

❖ Listening to the music was relaxing...

0-----1-----2-----3-----4-----5-----6-----7
(not at all)       (very relaxing)

❖ I would like to try listening to music again before breastfeeding...

0-----1-----2-----3-----4-----5-----6-----7
(not at all)       (definitely)

For follow up purposes 1 week after discharge, please list the telephone number you will be able to be reached at: ________________________ or _______________________

Thank you for your time and participation in this study. You and your new infant are greatly appreciated!
Please rate your following experiences by circling the appropriate number on the scales below:

- **During this breastfeeding experience with my infant, I felt…**
  
  0-----1-----2-----3-----4-----5-----6-----7
  
  (not comfortable)       (very comfortable)

- **Compared to previous breastfeeding experiences, this experience was…**
  
  0-----1-----2-----3-----4-----5-----6-----7
  
  (not comfortable)       (very comfortable)

- **Right now I feel…**
  
  0-----1-----2-----3-----4-----5-----6-----7
  
  (not relaxed at all)       (very relaxed)

- **I have previously been anxious about breastfeeding…**
  
  0-----1-----2-----3-----4-----5-----6-----7
  
  (very anxious)        (not at all)

- **I am anxious about breastfeeding in the future…**
  
  0-----1-----2-----3-----4-----5-----6-----7
  
  (very anxious)        (not at all)

- **My baby responded more positively during this experience then previously…**
  
  0-----1-----2-----3-----4-----5-----6-----7
  
  (no difference or less)       (much more positive)

For follow up purposes 1 week after discharge, please list the telephone number you will be able to be reached at: ________________________ or ________________________

Thank you for your time and participation in this study.
You and your new infant are greatly appreciated!
APPENDIX G

Self Report, Post Post-test Survey
Subject # ______

Post Post Experimental Self Report via Telephone

Please rate your following experiences by circling the appropriate number on the scales below:

✧ During breastfeeding experiences with my infant, I feel…
   
   
   0-----1-----2-----3-----4-----5-----6-----7
   (not comfortable)      (very comfortable)

✧ Compared to previous breastfeeding experiences in the hospital, I am now…
   
   
   0-----1-----2-----3-----4-----5-----6-----7
   (not comfortable)      (very comfortable)

✧ When thinking about breastfeeding now, I feel…
   
   
   0-----1-----2-----3-----4-----5-----6-----7
   (not relaxed at all)      (very relaxed)

✧ I have had anxiety about breastfeeding since I have been home…
   
   
   0-----1-----2-----3-----4-----5-----6-----7
   (very anxious)      (not at all)

✧ I am anxious about continuing to breastfeed…
   
   
   0-----1-----2-----3-----4-----5-----6-----7
   (very anxious)      (not at all)

✧ My baby is responding more positively during breastfeeding…
   
   
   0-----1-----2-----3-----4-----5-----6-----7
   (no difference or less)     (much more positive)

✧ Since I have been home I have used music before or during breastfeeding…
   
   
   0-----1-----2-----3-----4-----5-----6-----7
   (not at all)      (all the time)

✧ When using music during breastfeeding experiences with my infant, I feel…
   
   
   0-----1-----2-----3-----4-----5-----6-----7
   (not comfortable)      (very comfortable)

✧ Compared to breastfeeding experiences with out music, experiences with music are…
   
   
   0-----1-----2-----3-----4-----5-----6-----7
   (not comfortable)      (very comfortable)

✧ Listening to the music at home was relaxing…
   
   
   0-----1-----2-----3-----4-----5-----6-----7
   (not at all)      (very relaxing)

✧ My baby responded more positively during music experiences then without music…
   
   
   0-----1-----2-----3-----4-----5-----6-----7
   (no difference)     (much more positive)

✧ I will continue listening to music before breastfeeding…
   
   
   0-----1-----2-----3-----4-----5-----6-----7
   (not at all)      (definitely)
Subject # ______

Post Post Control Self Report via Telephone

Please rate your following experiences by circling the appropriate number on the scales below:

❖ During breastfeeding experiences with my infant, I feel…

0-----1-----2-----3-----4-----5-----6-----7
(not comfortable) (very comfortable)

❖ Compared to previous breastfeeding experiences in the hospital, I am now…

0-----1-----2-----3-----4-----5-----6-----7
(not comfortable) (very comfortable)

❖ When thinking about breastfeeding now, I feel…

0-----1-----2-----3-----4-----5-----6-----7
(not relaxed at all) (very relaxed)

❖ I have had anxiety about breastfeeding since I have been home…

0-----1-----2-----3-----4-----5-----6-----7
(very anxious) (not at all)

❖ I am anxious about continuing to breastfeed…

0-----1-----2-----3-----4-----5-----6-----7
(very anxious) (not at all)

❖ My baby is responding more positively during breastfeeding…

0-----1-----2-----3-----4-----5-----6-----7
(no difference) (much more positive)
APPENDIX H

Demographics and Medical Information

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**Mother**

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**Infant**

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