The Use of Music in Labor: Pain Perception

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Abstract
The Use of Music In Labor: Pain Perception
Kathy Jo Keever
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Melzack and Wall's gate control theory (Akin 1991; Bonica 1979; Jimenez 1988; Seigel 1974) has been used to explain the effectiveness of many techniques for pain relief in labor, including attention focusing with music. The purpose of this study was to determine the effect of music used for relaxation in labor on patients' pain perception. A quasi-experimental pilot study was performed using a convenience sample, randomized into control and experimental groups. The setting was a military medical center labor and delivery unit with private labor/delivery/recovery rooms. Recruitment into the study was accomplished once the patient was admitted to the unit in active labor at greater than 36 weeks gestation, with a cervical dilatation of at least 4 cms. Eighteen families were approached for entry into the study with data collected from ten. Pain was assessed in both groups at two phases (4-6cm and 7-10cm) during the first stage of labor using the Gaston-Johannson Pain-O-Meter (1988). The experimental group listened to self-selected music from four pre-established categories. A cassette player was provided to allow both the laboring woman and her coach to listen to the music at a volume set by the patient. Pain assessment was performed after ten minutes of music listening and music was played continuously through the first stage of labor. Outcome measures included sensory and affective pain scores, total pain scores (sensory plus affective), and visual analogue scores. These were correlated with cervical dilatation at the time of measurement, gravity, parity, and use of pain medication. A significant difference was found, using a repeated measures ANOVA, between the groups in the total POM scores ($p=.0189$), with separate affective, sensory and VAS scores revealing no significant differences ($p<.05$). Pearson's correlations among variables revealed no clinically significant relationships. The authors conclude that music in labor has the potential for decreasing reported pain in labor but further investigation is warranted.

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Chapter I

Introduction

Statement of Purpose

The purpose of this study was to determine the effects of the use of music in labor on patients' pain perception.

Background

For centuries, birth has been viewed as a culturally diverse and significant event. In the contemporary American culture, the pain of childbirth has been accepted as requisite to the experience (Clark, McCorkle, and Williams, 1981). With the evolution of modern medicine, techniques and methods were developed to decrease the pain and duration of labor. However, all too often these procedures were invasive, decreased the mother's active participation, and according to Brazelton (1970) were potentially harmful to the neonate.

"Childbirth Without Fear", by Dr. Grantley Dick-Read (1944), stated, "pain in childbirth could be

greatly reduced or even totally eliminated through understanding the process of labor and delivery and through learning to relax properly." Dr. Dick-Read's idea of relaxation reducing the pain of childbirth served to support his theory of a fear-tension-pain syndrome. Although he never tested this theory, Lederman, Work, and McCann (1978) found that plasma epinephrine (a biochemical measure of anxiety) was significantly increased in subjects with increased maternal anxiety.

Almost all "natural" or "prepared" childbirth techniques focus on breaking the fear-tension-pain cycle. Relaxation is the common thread found in these techniques for reduction of muscle tension and pain in childbirth. Since the mid 1900's, music has been universally recognized and appreciated as a source of pleasure, relaxation, and diversion (Podolsky, 1954). DiFranco (1988), stated that the "use of music for women during childbirth is not new; its soothing properties have been known for centuries". In ancient history, the Greeks were known to have played songs on the lute to expectant mothers and Pythagoras regarded

"music as a valuable therapeutic agent in mental and emotional health" (Podolsky, 1954). Increasingly, childbirth education classes have incorporated music in their curricula to enhance relaxation and decrease the anxiety and pain associated with labor and delivery (DiFranco, 1988). The use of music as a pain-reduction strategy in the setting of labor and delivery is particularly appealing because it is nonintrusive, economical, and generally appealing to women of childbearing age (Geden, Lower, Beattie, and Beck, 1989).

Significance

With the increasing interest in music as an adjunct to relaxation techniques taught in childbirth education, the nurse carries a great obligation to acquire a knowledge base regarding its implications in labor and delivery, for these educated patients as well as the general population of laboring families. Women receiving childbirth education have obtained the benefits of reduced medication use, decreased perceptions of pain, greater marital satisfaction, and

greater enjoyment of delivery (Harmon, Hynan, and Tyre, 1990). If music can provide the benefit of pain relief, it's use for those not able to receive childbirth education may also afford them with some of the afore mentioned benefits. With an active involvement in the birth process, the woman decreases her sense of dependency on others, increases her own sense of mastery and self-confidence, and allows for increased sharing and intimacy with her labor partner (Shrock, 1988). This decreased dependency beyond her coach can lessen the impact of stress found with limited nurse staffing situations in our hospitals today. With the potential for decreased time demands on hospital personnel and increased satisfaction for the clients, further investigation of music's role in childbirth appears warranted.

Conceptual Framework

Melzack and Wall's gate control theory (Akin 1991; Bonica 1979; Jimenez 1988; Seigel 1974) has been used to explain the effectiveness of many techniques for pain relief in labor including, attention focusing with

music. Since it's description in 1965, this theory of pain control states that the pain stimulus can be modified or ignored as it travels through the spinal cord, brain stem, and cerebral cortex. As the pain stimulus is transmitted, it reaches the substantia gelatinosa, a "highly specialized closed system of cells that extends throughout the spinal cord on both sides" (Bonica, 1979). The speed at which impulses are conducted depends on the diameter, degree of myelination, and route taken by the nerve fibers. A gating mechanism is established between the small diameter fibers, carrying the pain impulse, and the larger diameter fibers, encompassing mechanoreceptors, chemoreceptors, and thermoceptors in the ascending pathways as well as cognitive (focusing) strategies in the descending pathways. The gate-control theory emphasizes the need for a supportive environment allowing the laboring woman to use the various higher mental activities, of which listening to music can be included, to decrease her perception of the pain of labor (see Fig. 1).

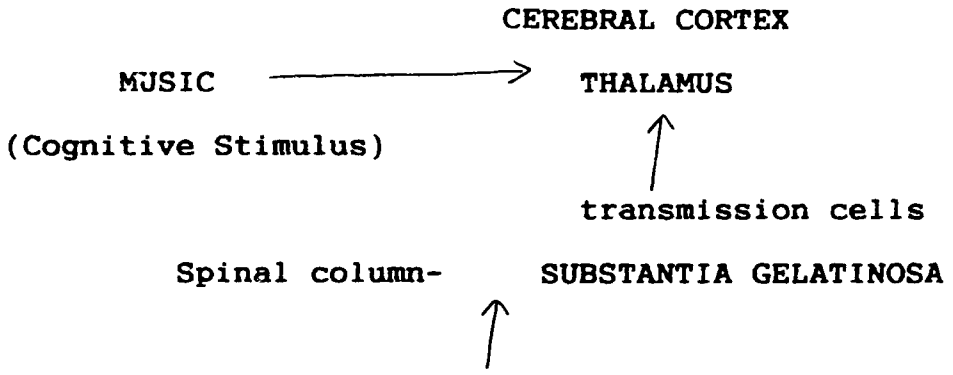

Fig. 1: Gate-Control Theory

Grantley Dick-Read's theory of the fear - tension - pain cycle serves as a basis for the success of "natural" or "prepared" childbirth techniques. He diagrammed this theory as a vicious circle that continuously feeds on itself unless an outside force breaks the cycle (See Fig. 2). The most effective way to break this chain of events is to relieve tension and overcome fear, thereby alleviating the associated pain. "Many researchers have suggested that the breathing techniques used in the Lamaze psychoprophylactic method constitute a means of attention focusing by the mother." Wepman (1978) suggests that attention focusing not only increases pain tolerance, but may

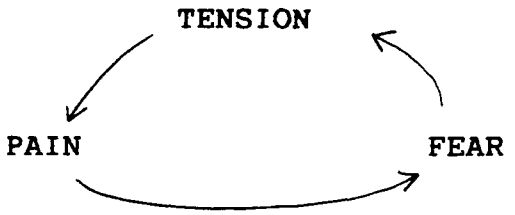

Figure 2: Dick-Read's Pain Cycle

totally eliminate pain sensation (Clark, et al., 1981). The addition of music to the methods employed in prepared childbirth serves to increase the effectiveness of these techniques since "music has the potential for becoming an effective attention focusing stimulus" as well as a "conditioned stimulus for relaxation" (Clark, et al., 1981).

According to Beck's Pain Chain the element of anxiety, which is similar to Grantley Dick-Read's element of fear, leads to increased pain and increased serum epinephrine which decreases uterine contractility and can ultimately increase the length of labor (Nichols and Humenick, 1988) (See Fig. 3).

The use of music as a non-invasive alternative for pain management is affordable to the general population. It's use may activate the gate-control

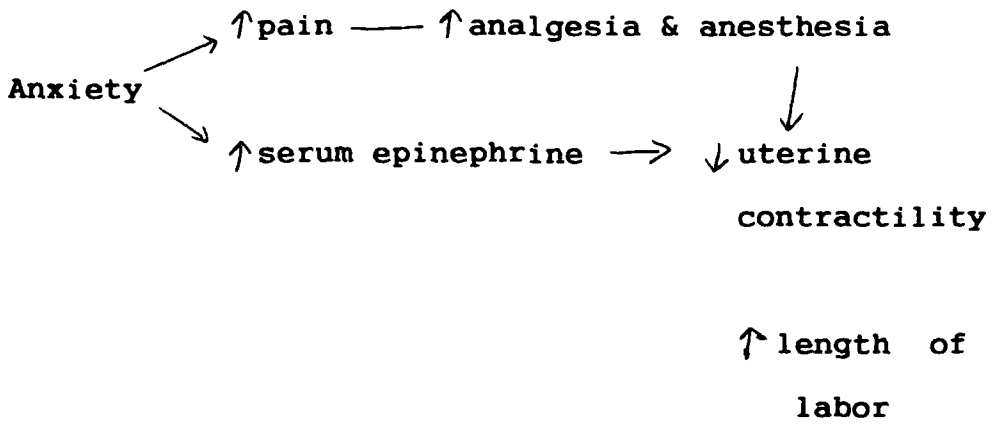

Figure 3: Beck's Pain Chain

mechanism to alter pain perception and relieve anxiety through relaxation (see Fig. 4).

Assumptions

1. Human beings are able to express pain
2. Labor is a natural process
3. Labor is a stressful event
4. Labor is painful
5. Music is relaxing
6. Music can alter response to pain

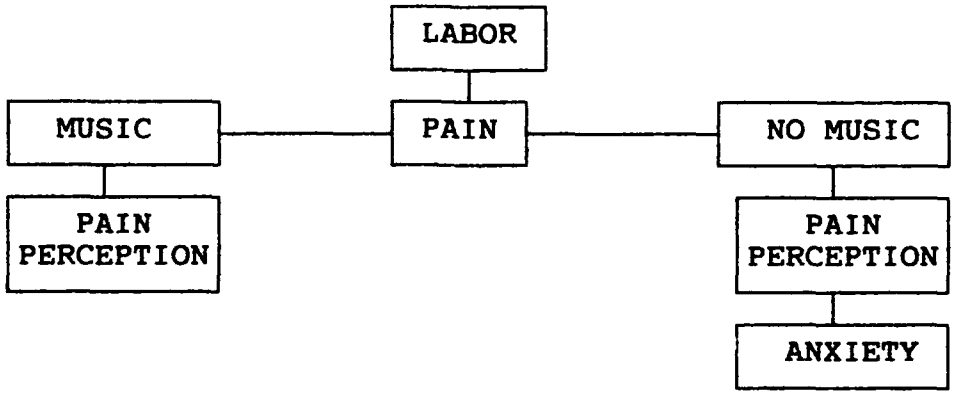

Fig. 4: Conceptual Model

Research Question

What is the effect of music on the perception of pain in labor?

Chapter II

Review of Literature

Many studies have analyzed the physiology and etiology of pain and its management (Bromm, 1984; Chapman and Loeser, 1989; Jacox, 1977; Melzack, 1983; Sternbach, 1986; Wall and Melzack, 1989). There is no clear consensus about the intensity and quality of the pain experienced during labor (Gaston-Johansson, Fridh, and Turner-Norvell 1988). Most authors describe pain as a subjective experience that is multidimensional and consists of sensory and affective components. Evaluation of human labor has led to the description of it as an acute,"unpleasant sensory, emotional and situational experience" (Brown, Campbell, and Kurtz, 1989).

The pain perceived in childbirth is explained by the gate-control theory of pain proposed by Melzack and Wall. This theory supports the belief that labor pain is not simply of a psychic origin. Several studies have shown that the intensity of pain experienced in labor is directly related to the increasing frequency

of uterine contractions and dilatation of the cervix, thus establishing that the pain is not purely psychological. (Brown et al., 1989; Corli, Grossi, Roma, and Battagliarin, 1986; Melzack, Kinch, Dobkin, Lebrun, and Tainzer, 1984). The two major physiological components of the pain of labor have been identified as: (a) visceral pain caused by uterine contractions, cervical dilation, and stretching of the adnexa and uterine ligaments; and (b) somatic pain due to the *dilatation* of the perianal plane, vagina and external genitals during the expulsion phase (Corli et al., 1986).

Regardless of the origin of the pain of labor, Stewart (1977) proposed that the pain experience is interpreted by the mind and the intensity of the perceived pain can by modified by conscious and unconscious thoughts or emotions. The actual content or timing of the pain experience is affected by cognitive processes involving events both inside and outside the body.

The events within the human body that affect the intensity of pain perception encompass fear, anxiety,

and the body's physiological responses to these emotions. As seen earlier, Beck's Pain Chain diagrams the physiologic effects of fear and anxiety on the perception of pain. The goal of relaxation techniques such as listening to music, is to alter the woman's perception of the pain experience by active participation in relaxation. Subsequently, decreased anxiety and fear are appreciated. As Jacobson stated, "it is physically impossible to be nervous (tense) in any part of your body, if in that part you are completely relaxed" (1948). Other factors within the body that affect the intensity of pain in labor are the amount of cervical dilation and the intensity and pattern of uterine contractions. Brown, Campbell, and Kurtz (1989), described self-reported pain during two different stages of dilation in seventy-eight women. Each participant used three different self-report measures (Visual Analogue Scale-VAS, Present Pain Intensity-PPI, and McGill Pain Questionnaire pain rating index-MPQ) between 2-5cm dilation and repeated these measures between 6-10cm dilation. Additionally, a nurse rated Behavioral Index of Pain was performed

during each of the two stages. The authors used paired-comparison t tests to determine differences in the mean scores on each test. The results showed that pain intensity increased significantly from the first measurement to the second using the VAS. The description of the intensity changed from discomforting to horrible and excruciating between the two measurements on the PPI. Pain during the first stage of labor was also found to correlate with parity of the participant. Primigravidas reported significantly higher pain levels than multigravidas on each measure. These findings of the relationship between parity and pain perception support the results of a 1988 study by Gaston-Johansson, Fridh, and Turner-Norvell. In this study, fifty primiparas and eighty-eight multiparas rated their labor pain using the Johansson pain-o-meter (which contains eleven affective and twelve sensory pain word descriptors) and the VAS. The measurements were obtained during three phases of labor which were determined by cervical dilation. In Stage I the cervix was dilated 2-4cm; Stage II, 5-7cm; and Stage III, 8-10cm. The authors were unable to complete three

separate measurements on some of the subjects due to arrival at the hospital in Stage II or Stage III labor. A two way analysis of variance with repeated measures was used to test for the effect of parity. Primiparas had a higher affective component of pain in all three stages of labor than multiparas. Primiparas reported more sensory pain than multiparas in Stage I and III but reported less than multiparas in Stage II.

Lowe (1987) also studied the effects of parity on labor pain. Using a convenience sample of seventeen primiparas and thirty-three multiparas, she administered the McGill Pain Questionnaire during the early (0-3cm), active (4-7cm) and transitional (8-10cm) phases of the first stage of labor and immediately after delivery for the second stage of labor. Results were analyzed using multivariate analysis of variance (MANOVA). The repeated measures used one between subjects factor, parity, and one within-subjects factor, phase of labor. Lowe concluded that primiparas reported more severe pain than multiparas during early labor and less pain during second stage. She discussed other factors which may have contributed to increased

pain levels in primiparas including increased state anxiety, decreased confidence, and increased duration of early labor as well as a more established contraction pattern than multiparas. When state anxiety or confidence in ability to handle labor was entered as a covariate, the differences in scores between primiparas and mulitparas was no longer significant. This suggests that the use of measures to decrease anxiety, such as listening to music would serve to reduce the amount of pain perceived by primiparas in first stage labor.

Corli, Grossi, Roma, and Battagliarin (1986), observed fifteen primiparous women undergoing tocography during the second phase of the first stage of labor (dilation ranged from 2-9cm). The goal was to evaluate the characteristics of the uterine contractions experienced in labor by measuring intensity, duration, and pattern. Pain was measured subjectively using the VAS and was correlated to the tocographic curves of the contractions. There was a significant correlation of the subjective pain assessments with the maximum intensity of the

contraction. Their results suggest that pain during the first stage of labor fluctuates along time within the same subject and correlates with the characteristics of uterine contractions.

Environmental factors also affect the experience of pain in childbirth. Varrassi, Bazzano, and Edwards (1989), studied thirty-six multigravidas to determine whether plasma endorphin levels could be elevated by exercise conditioning during pregnancy. An experimental group of fifteen women participated in muscle conditioning and stretching exercises during the course of their pregnancy. Both groups completed pain assessments during labor using a VAS. Plasma endorphin levels were found to be elevated during labor in the experimental group while cortisol, human growth hormone, and prolactin levels were lowered. These results were correlated with results of the VAS measurements and showed that the experimental group had reduced pain perception in labor.

Norr, Block, Charles, Meyering and Meyers, (1980), developed a causal model of factors which influence pain and enjoyment in childbirth. The five main

categories listed in this model include the patients background, pregnancy experience, labor process, labor setting, and medication. The factors negatively impacting the birth experience included, age, menstrual problems, traditional sex roles, and pregnancy and childbirth concerns. This negative impact was expressed as increased reports of pain, increased medication use, and decreased enjoyment of the experience. (see Fig.5).

Pain is a highly personal, variable experience influenced by cultural learning, the meaning of the situation, attention, and other cognitive activities (Sternbach, 1986). In this model, culture is exemplified by traditional sex roles. According to Dr. Grantley Dick-Read (1944), the more advanced the culture the more painful and dangerous childbirth is perceived. Since the advent of prepared childbirth training, partner support within more advanced cultures has increased, and is reported to reduce subjective pain and anxiety (Copstick, Taylor, Hayes, and Morris, 1986).

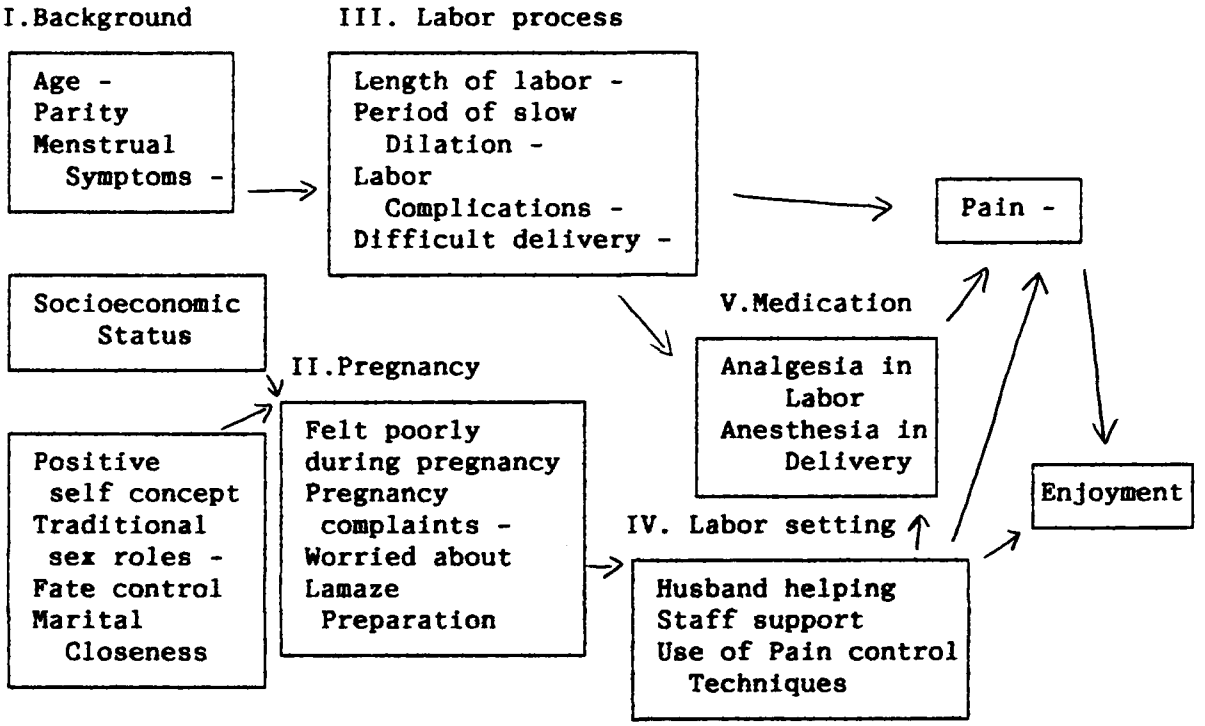

Figure 5: A MODEL OF FACTORS INFLUENCING PAIN AND ENJOYMENT IN CHILDBIRTH (Norr et al., 1980)
(Note: Minus sign indicates a negative impact on the birth experience, increasing pain or decreasing enjoyment.)

Another influence on pain in labor, is the effect of posture and mobility in labor and it's effect on maternal comfort and use of pain medications. Ambulatory and upright mothers reported greater comfort and required slightly less analgesia (Lupe and Gross, 1986).

It remains unclear exactly how analgesia alters the pain experience, but Gracely, McGrath, and Dubner (1978) suggest that analgesics act by modifying either the sensory or affective component of pain. Several authors suggest that the use of noninvasive pain relief methods such as relaxation and music therapy, may be useful for reducing the affective component of pain (Clark et al., 1981; Gaston-Johansson, et al., 1988; Winokur, 1984). Winokur (1984), and Clark, McCorkle, and Williams (1981), proposed that attention focusing techniques can increase pain tolerance. For instance, distraction can draw attention away from the pain and replace it with a pleasure response. The pleasure response will be the trigger stimulus for neuromuscular relaxation (Winokur, 1984). The use of music as a distraction or attention focus in labor should serve to draw attention away from the pain experienced in labor.

Winokur (1984) shares an observation by Livingston (1979) that one of the positive aspects of music in childbirth is enhancement of relaxation. This view is also shared by Clark, McCorkle and Williams (1981) in their study of music supported labors. An experimental

group of thirteen patients reported an increased helpfulness of relaxation techniques and decreased pain and discomfort. The participants took part in six individual, predelivery music therapy sessions and listened to preselected musical works during labor. The assessment tool used was a fifteen item Childbirth Experience Questionnaire. A two-sample t-test was used to analyze some of the questionnaire responses. A multiple correlation matrix was constructed to determine the value of music therapy home practice. Hanser, Larsen, & OConnell (1983) examined the effect of music on relaxation during labor. All seven respondents studied displayed fewer pain responses while music was playing. These participants had attended two individual music therapy sessions where the purpose of the music was explained to (a) cue rhythmic breathing; (b) assist relaxation through positive association with the music; and (c) focus attention on the music. Music was played continuously for a duration of ten contractions, alternating with silence for five contractions throughout the length of labor. Participants were observed during labor and

their tension and/or relaxation in various body parts was recorded. The differences in pain response scores were analyzed using a nonparametric Wilcoxon Signed Ranks Test in a repeated measures design with the participants serving as their own control.

Only one study has concluded that "the value of music as a conditioning aid for childbirth is not clearly demonstrated,"(Durham and Collins, 1986). This conclusion was based solely on the lack of statistical difference in the amount of medication used during labor when music was employed. The total sample size of thirty couples was divided into an experimental group and a control group of fifteen each. The experimental group listened to tape recorded music while practicing relaxation/breathing techniques in prepared childbirth classes. Music was played on a recorder during labor and frequency of medication was documented for each group. Chi-Square analysis was utilized.

It is apparent that the perception of pain in childbirth is influenced by a multitude of events occurring both internally and externally. Only six

studies were found in the literature that addressed the use of attention focusing with music in labor and five of these demonstrated its benefits. However, all of these studies involved the practice of relaxation techniques while listening to music in prepared childbirth classes prior to labor. One must question whether the benefits obtained are a result of the music or of a conditioned association between the music and a relaxed state.

The literature only demonstrates the benefits of increased relaxation on pain perception in patients attending specialized prepared childbirth training with music therapy. Since we view childbirth as a naturally occurring process, it is logical to strive to establish non-medical interventions to assist this process for all patients regardless of previous training in relaxation. Music may well be the medium that allows parturient women to discard the belief that they have failed at "natural childbirth" if they require medical intervention or assistance. Once these myths are dispelled, they can be confident enough in their own body's ability to successfully labor and childbirth

will once again be viewed in our society as an inherently natural process.

Chapter III

Methodology

Purpose of the Study

The purpose of this study was to investigate the effects of the use of music on patient's pain perception in labor.

Research Question

What is the effect of music on the perception of pain in labor?

Design

The design of this study is a quasi-experimental, pilot study. According to Woods and Catanzaro (1988), a quasi-experimental design is one in which the investigator manipulates the experimental condition while utilizing various types of control to maintain the internal validity of the findings. Some quasi-experimental designs do not use a control group and others do not have randomization of the subjects.

A control and experimental group were used with an attempt to randomize subjects into the two groups. If a subject had previously planned to utilize music during their labor prior to enrollment in this study, they were assigned to the experimental group. The Visual Analog Scale and Pain-o-meter were used to measure perception of pain during two phases of active labor for both groups. Additional data concerning the subject was obtained through a demographic and factual questionnaire. The results from the two groups were then compared.

Setting

This study was conducted in a 305 bed Military Medical Center in the Washington D.C. area. Patients for this study received their prenatal care in the obstetrics clinic located within the Medical center. After admission, laboring patients were cared for on a 5 bed labor and delivery unit. There were three private Labor/Delivery/Recovery rooms (LDRs) and 1 semi-private labor room (which can be converted to a private LDR or if both beds are occupied, the patient

is moved to another LDR or delivery room (DR) for delivery. After recovery, the patient was transferred to the postpartum unit which contains private and semiprivate rooms. Both mother and infant were discharged 24-48 hours after delivery if there were no complications.

Sample

This convenience sample was recruited from women between the ages of 20 and 35 who presented in active labor at the aforementioned facility. The goal was to have a sample of n=20, with control group n=10 and experimental group n=10 subjects.

Inclusion criteria included:

Gestation of greater than 36 weeks

Active labor with cervical dilatation of at least 4 cms

Ability to read and understand English

Absence of any prenatal complications ie: Gestational Diabetes, Pregnancy Induced Hypertension, etc.

Labor coach must be present

Exclusion Criteria included:

Declines to be in the study

Does not complete the first stage of Labor ie: Cesarian section prior to 10 cms dilatation

Preexisting back injury as determined by chart review or patient report

Unable to comprehend and/or follow verbal instructions

No labor coach present

Variables

The variables being studied were pain and music.

Pain =

Theoretical definition - the perception of an unpleasant sensory and emotional experience with multidimensional factors that occur in specific situations and evoke a behavioral response (Brown et al., 1989). It is also a "highly personal, variable experience that is influenced by cultural learning, the meaning of the situation, attention, and other cognitive activities" (Melzack in Sternbach, 1986).

Operational definition - scores obtained on two scales: Visual Analogue Scale and Pain-o-meter scale (Gaston-Johansson et al.,1988).

First stage of labor =

Theoretical definition - the first stage of labor is the interval between the onset of labor and full cervical dilatation (O'brien & Cefalo, 1986).

Operational definition - Phase I is the start of active progression of dilatation which is 4 cm to 6cm and Phase II is the transitional period from 7cm to 10cm (Lederman et al., 1985). Dilation is measured by vaginal exam of the primary provider or labor nurse.

Music =

Theoretical definition - an art of sound in time which expresses ideas and emotions in significant forms through the elements of rhythm, melody, harmony, and color. It is a temporal art form and is called "the language of the soul" (Podolsky, 1954).

Operational definition - pre-recorded melodies that the patient selects from an assortment of four

styles of music that the patient judges to be soothing and relaxing (classical/new age, soul/R&B/jazz, adult contemporary, soft rock/oldies/country, or music patient has brought with them). The music was played on a cassette player during the first stage of labor (Guzzetta, 1989).

Extraneous variables to be documented:

1. Time and method of rupture of membranes
2. Time, type, route and amount of medications used
3. Position, and weight of infant

Procedure

After informed consent was obtained, participants were randomized into one of two study groups. The control group was admitted and cared for in labor by the staff on duty in the usual fashion for this institution. The experimental group was given the choice of 4 different types of prerecorded music to listen to during their labor.

The four basic categories of music were Classical/New Age, Soul/R&B/Jazz, Adult contemporary, and Soft Rock/Oldies/Country. A 5th category was available for the patients own music, if it was available and did not fit into any of the above categories. These patients also received standard obstetrical care from the on duty staff.

A stereo cassette player was provided to play the music and batteries were available to facilitate ambulation while listening if the participant desired. The volume of the music was controlled by the participant.

The music was played for at least 10 min. prior to the first data collection, then remained playing until the second data collection. At this point, the patient was given the option to continue listening to music or to turn the music off.

Initial data was gathered by a demographic questionnaire. The information collected included: age, education, ethnicity, family income, attendance at childbirth education, exercise during pregnancy, and

the coach's sex, age, education, and attendance at childbirth classes.

The remainder of the data was obtained at two points during the first stage of labor. The two measurements were taken between 4-6 cms and 7-10 cms. dilation. The cms dilatation was documented as well as the use of any analgesia during the test period.

Labor pain was assessed by use of the Gaston-Johannson Pain-o-meter (POM). This two-sided hand held tool provided for self-report of the sensory and affective aspects of pain by word lists on one side and a visual analogue scale (VAS) on the other (see appendix). Criterion validity was established by Gaston-Johansson et al. (1988) in relation to the McGill Pain Questionnaire in a study of rheumatoid arthritis and chronic pain patients. Construct validity has also been demonstrated in a study of intensity of labor pain in primiparas and multiparas (Gaston-Johansson et al., 1988). Reliability of the Pain-o-meter was estimated in the same study of laboring women using the test-retest method with

significant scores ranging from r=.56 to r=.74, p<.05 (Gaston-Johansson et al., 1988).

Reliability and validity of the VAS is scarce, but Gaston-Johansson et al., (1988) found correlations ranging from r=.60 to r=.81 with verbal numerical rating scales in the literature.

The tool was held by the participant and marked on with a wipe off pen after instructions were given on it's use.

Two researchers were involved in the data collection. Inter-rater reliability for the Visual analogue scale was established at 90% within 0.1 cm measurement. A detailed procedure script was used to ensure consistency in admission to the study as well as the collection of data.

Results

Eighteen families were approached for entry into the study with data collected from eleven of these. Five subjects were randomized to the no music group and six to the music group. One participant was excluded when the history of chronic back pain was discovered.

This left five subjects in each group. The demographics are depicted in Tables 1&2.

Assessments, obtained at 4-6 cms, revealed a mean of 5.1 cms and those done at 7-10 cms yielded a mean of 8.6 cms.

Using a student's t-test, there were no statistical differences found between the two groups as to ages of subjects or their coaches. Chi-square analysis revealed no differences between the groups among other demographic data with the exception of exercise during pregnancy. All participants in the music group reported some type of exercise during the pregnancy, the control group was divided with 2 reporting regular exercise and 3 relating none.

With a repeated measures ANOVA, a significant difference was found between the groups in the total Pain-O-Meter scores at P= .0189. The separate sensory and affective components as well as the visual analogue scale revealed no significant differences at P< .05 (see Table 3).

Pearson's correlations among all variables revealed no clinically significant relationships.

Anecdotal remarks noted from participants, their coaches, and staff are shared in Table 4.

Many of the control group were verbally disappointed that they would not get to listen to music. The medical and nursing staff voiced positive interest in the use of music but some were concerned that the patient would choose something that "they" (the staff) would dislike.

Discussion

Our findings show that although music used in labor may decrease overall pain perception it was not as effective as we had hoped in decreasing the sensory and affective components of pain. Our initial theory of music being a familiar medium which might provide comfort and attention focusing to laboring women in a hospital environment, was only partially supported by our results. However, the comments received from participants provide some insight into the potential of using music to assist relaxation. The limitations of our study, having a small sample, time constraints on the investigators (ie: convenience sample), and

enrolling subjects into the study while they were in active labor, prevent our results from being generalizable. One of the biggest problems encountered was the initial design of looking at the effect of music on both pain and length of labor. Since the setting was a large teaching hospital, it would have been formidable to control all of the variables that can affect length of labor (maternal position, fetal position, coach's participation, and use of medications). Prior to the onset of data collection, the investigators decided to focus on the effect of music on pain perception only.

Another entirely unexpected obstacle was that 33% of patients approached declined to participate in the study. Also, the process of assembling a representative collection of appealing music proved to be much more difficult, costly, and time consuming than projected.

We feel further study is warranted in this area with some design changes. Patients should be approached during antepartum visits in the last month of pregnancy and the study explained while she is

relaxed and comfortable. This would also allow patients to bring their own music selections with them in labor which may be more soothing and/or familiar to them. The variable of length of labor should be looked at when the investigator has the ability to more closely monitor and manipulate the setting.

Implications and Recommendations

Clinically, the use of music as a pain reduction strategy in the setting of labor and delivery is particularly appealing because it is nonintrusive, economical, and generally pleasing to families of childbearing age. If music can provide the benefits of increased relaxation, and therefore decreased pain perception, its use for those not able to receive the benefits of prepared childbirth is critical. These potential benefits include decreased medication use, decreased perceptions of pain and greater enjoyment of delivery. Women who take an active role in the birth process have a decreased sense of dependency on others and an increased sense of mastery and self-confidence. This decreased dependency beyond the coach can lessen

the impact of stress found with limited nurse staffing situations. With this potential for decreased time demands on hospital personnel and increased satisfaction for the clients, further investigation of music's role in childbirth appears warranted.

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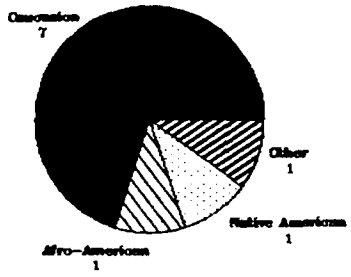
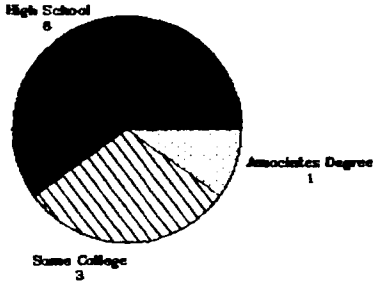
Music in Labor

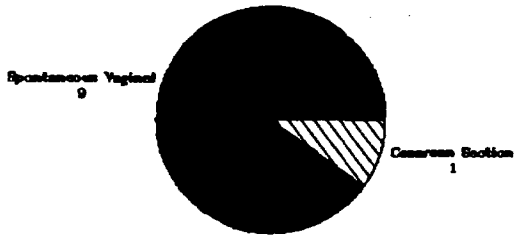
Ethnicity



Education



Type of Delivery



Number of previous deliveries

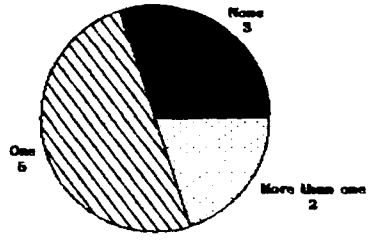
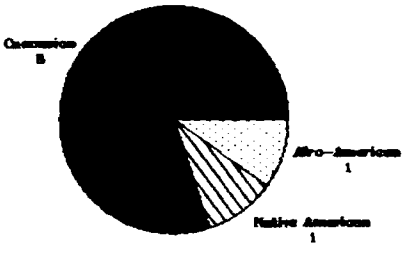
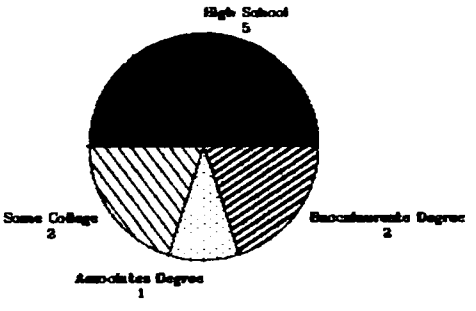


Table 1

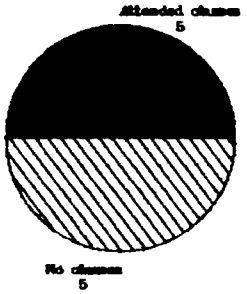
Coach's ethnicity



Coach's education



Childbirth Education



No. of classes attended

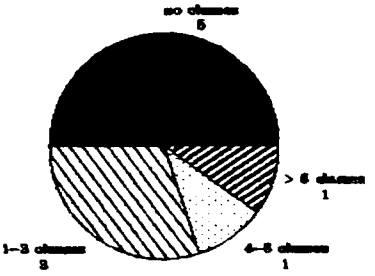
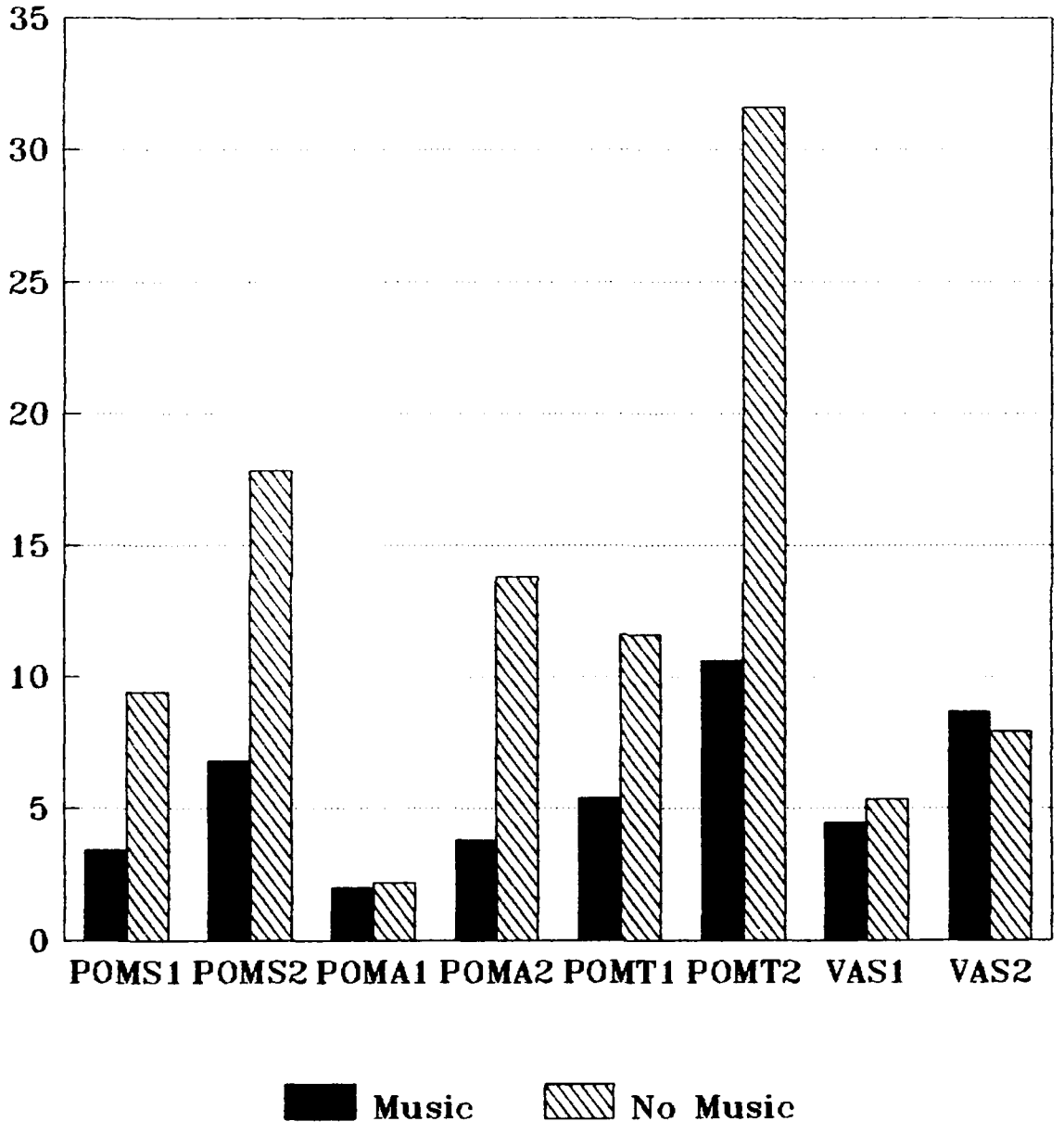


Table 2

PAIN-O-METER SCORE
MUSIC VS NO MUSIC



using means of scores Table 3

ANECDOTAL STATEMENTS

PATIENTS

"I really think the music made a difference"

"It gave me something to focus on"

COACH

"I don't know if it helped her, but the music was very relaxing for me"

STAFF

"The music helped "me" to stay calm"

"I hope they don't decide to play that "Rap" stuff"

"What an interesting concept!"

Table 4

Patient Questionnaire

Please complete the following questionnaire by circling the appropriate response or filling in the blanks as indicated.

Mother's information

1. age:
    1. 20-24
    2. 25-29
    3. 30-34
    4. 35 or older

2. Ethnic/Racial Identity:
    1. Native American
    2. Latin
    3. Caucasian
    4. African American
    5. Asian/Pacific
    6. Other _____

3. Education:
    1. Never completed high school
    2. High school Diploma
    3. Attended some college
    4. Associates Degree
    5. Baccalaureate Degree
    6. Master's Degree
    7. Doctoral Degree

4. Family Income:
    1. less than 10,000
    2. 10,001-30,000
    3. 30,001-50,000
    4. 50,001-70,000
    5. 70,001-90,000+

5. Did you attend a childbirth education class?
    1. Yes
    2. No

6. Number of childbirth education classes attended
    1. zero
    2. one - three
    3. four - six
    4. more than six

7. What method/type of classes _____

8. Were any of these techniques taught?:
    1. relaxation techniques
    2. breathing techniques
    3. relaxation with music
    4. guided imagery
    5. other techniques _____

9. Do you have any difficulties hearing?
   1. Yes explain _____
   2. No

10. Do you have a history of back injury prior to pregnancy?
   1. Yes explain:_____
   2. No

11. Did you exercise during pregnancy?
   1. Yes Type of exercise _____
      How often _____
   2. No

Labor coach's information:

1. Sex:
   1. Female
   2. Male

2. Age:
   1. Under 20
   2. 20-24
   3. 25-29
   4. 30-34
   5. 35 or older

3. Ethnic/Racial Identity
   1. Native American
   2. Latin
   3. Caucasian
   4. African American
   5. Asian/Pacific
   6. Other _____

4. Education
   1. Never completed high school
   2. High school Diploma
   3. Attended some college
   4. Associates Degree
   5. Baccalaureate Degree
   6. Master's Degree
   7. Doctoral Degree

5.Did you attend childbirth classes with the mother?
   1. Yes
   2. No

Researcher's Data

17. Patient ID # _____

18. Group 1. Music
2. No Music
Category _____ Titles _____

19. Gravida _____

20. Para __ __ __ __

21. Height ___ inches

22. Weight ___ pounds

23. ROM
1. Spontaneous 2. Artificial
Time _____

24. Infant's Presentation
1. Vertex 2. Face 3. Brow 4. Breech 5. Compound

25. Position
1. ROA 2. ROP 3. ROT 4. LOA 5. LOP 6. LOT 7. Other

26. Infant's weight
_____ gms (____ lbs ___ ozs)

27. Head circumference
_____ cms

28. Pain medication used?
1. yes 2. no

29. Type
1. IV 2. IM 3. Epidural
Medication _____
Dosage _____

30. Time given _____

31. Time of delivery ____

32. POM sensory score ____ #1 ____ #2 ____ Tot Dil #1 ____

33. POM affective score ____ #1 ____ #2 ____Tot Time #1 ____

34. Total POM score ____ #1 ____#2 ____ Tot Dil #2 ____

35. VAS ____ #1 ____ #2 ____ Tot Time #2 ____

Pain-O-Meter

Side 1

1

PAIN IS:

A	CRAMPING
B	DULL
C	SPLITTING
D	BURNING
E	SEARING
F	SORE
G	SHOOTING
H	RADIATING
I	HURTING
J	CRUSHING
K	ACHING
L	STABBING
M	SHARP
N	TEARING
O	PRESSING

Side 2

2

PAIN IS:

1	NAGGING
2	AGONIZING
3	ANNOYING
4	TROUBLESOME
5	KILLING
6	TIRING
7	UNBEARABLE
8	SICKENING
9	TERRIFYING
10	MISERABLE
11	TORTURING

Visual Analog Scale

MARK ON THE
SCALE HOW
MUCH PAIN
YOU HAVE

Excruciating pain

No pain

[Appendix E]