Visual Biofeedback: Adjunct Mirror Intervention during Stage Two Labor among Primiparous Women

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Abstract - This study determined the effectiveness of visual biofeedback in hastening stage II of labor between primiparous women administered with adjunct intervention and those who were not. A non-equivalent post-test design with twenty primiparous women distributed to both control and experimental groups chosen through purposive sampling. A 3 x 2 foot mirror to provide visual biofeedback (treatment), a stopwatch to measure the length of time elapsed from full cervical dilatation and effacement to the delivery of baby, and a tally sheet for recording of data were used in data gathering. Findings show that the control group (not subjected to mirror) obtained the mean of 18.92 (SD=7.17) while the experimental group (subjected to mirror) obtained a mean of 6.77 with a mean difference of 12.15 (SD=5.24). The computed t-test value is 4.37, which was greater than the table value of 2.23 tested at 0.05 level of significance. Results showed a significant difference in the duration of second stage of labor, thus, the use of mirror as a feedback mechanism during the second stage of labor reduces its duration.
INTRODUCTION

Since time immemorial, difficulty in bringing forth another human being has been one of the greatest apprehensions women have to confront themselves with. As exemplified by cases of infant mortality and incidence of death among mothers due to giving birth in such an alarming rate. It can be noted that techniques, in whatever form or design, to efficiently assist birthing process have become a prevalent trend.

In connection, this research study was conducted in the spirit of providing ample information on Visual Biofeedback: Adjunct Mirror Intervention During Second Stage of the Labor Process of Primiparous Women which is deemed to have a high probability in the improvement of assisted birthing process. Traditionally, Bradley method of delivery (“husband-coached childbirth” although the coach is not necessarily the husband of the woman), is employed as a conditioned stimulus using the sound of voice, use of particular words and repetition of practice in encouraging shorter delivery time. As compared to traditional coaching, visual biofeedback is used as an alternative technique that would ultimately answer the need to hasten the specified phase of the labor process. The use of a “reflection apparatus” or a mirror, aims to provide immediate visualization of the birthing progress thus encouraging correct bearing down by the mother consequently lessening the hard work. As a corollary, a significant change and difference can be noted in the delivery of a newborn. However, it is imperative to recognize the fact that the researchers formulated quantitative analysis to make the study well grounded and credible.

Biofeedback technique and its principle have been universally known. Not only has their contribution become very significant in science but also in ordinary daily activities. Citing one simple example is the task of combing the hair. By looking at the mirror, a person is guided on how to fix his hair. Visual stimulation is utilized in controlling and doing appropriate actions.

FRAMEWORK

Labor is traditionally divided into three stages: a first stage of dilatation, beginning with true labor contractions and ending when the cervix is fully dilated; a second stage, from the time of full dilatation until the infant is born;
and a third stage or the placentental stage, from the time the infant is born until the delivery of the placenta.

With full dilatation of the cervix, which signifies the onset of the second stage of labor, the woman typically begins to bear down with the descent of the presenting part. Uterine contractions and accompanying expulsive forces may last 11/2 minutes and recur at times after a myometrial resting phase of no more than a minute. (Chapter IV: 314. Management of Normal Pregnancy. William’s Obstetrics).

In most cases, bearing down is reflex and spontaneous in the second stage of labor, but occasionally the woman does not employ her expulsive forces to good advantage and coaching is desirable. Her legs should be half-flexed so that she can push with them against the mattress. Instructions should be to take a deep breath as soon as the next uterine contraction begins and with her breath held, exert a downward pressure exactly as though she were straining at stool. Usually, bearing down efforts are rewarded by increasing bulging of the perineum -- that is, by further descent of the fetal head. The mother should be informed of such progress, for encouragement at this stage is very important.

The median duration of the second stage (from complete dilatation of the cervix to delivery) is 50 minutes in nulliparas and 20 minutes in multiparas, but it can be highly variable. In a woman of higher parity with a stretched vagina and perineum, two or three expulsive efforts after the cervix is fully dilated may suffice to complete the delivery of the infant. Conversely, in a woman with a contracted pelvis or a large fetus, or with impaired expulsive efforts, the second stage of labor may be abnormally long. (Chapter IV: 314. Management of Normal Pregnancy. William’s Obstetrics)

The present study is an attempt to develop a new means of hastening the stage II of the labor process. Visual Biofeedback is relatively noninvasive and practical, using a device (e.g. mirror) that provides immediate visualization of the birthing process. There are at least two reasons to expect that visual biofeedback may be used to assist patients during labor: First, therapies that incorporate sensory feedback provided by a clinician (e.g., EMG, spirometers, etc.) have reported substantial success. For example, two studies using electromyography (EMG) have recently explored biofeedback as a means of assessing and re-mediating movement disorders associated with focal brain damage (Bradley L, et al, 11-22). These findings suggest visual biofeedback could be used in obstetrics to promote correct “bearing down” techniques of a woman in labor to further expedite the birthing process.
Second, adjunct visual biofeedback therapy may offer several important features that cannot be found in the conventional, traditional methods. For example, in visually-guided biofeedback, when the patient generates appropriate motor behaviors, they are positively reinforced. The visual feedback stimuli and other non-verbal information is usually much faster and accurate than the clinician’s comments. These considerations may be especially important for individuals having a primary difficulty in coordinating voluntary contractions during labor. With these considerations in mind, the researchers explored visual biofeedback as a means of expediting stage II of labor. Specifically, the researchers have looked into any significant change in length of time in the stage II of labor in patients employing the adjunct intervention.

This study is anchored on the growing body of evidence in other health sciences suggesting visual biofeedback can assist individuals in training by providing a graphic representation of physiological data and by facilitating awareness and a faster development of self-regulation (Wong AM, 322-7). Biofeedback is a technique intended to teach patients self-regulation of certain physiologic processes. The technique involves the feedback of a variety of types of information not normally available to the patient, followed by a concerted effort on the part of the patient to use this feedback to help alter the physiological process in some specific way.

Patient motivation plays a major factor in any therapy. Biofeedback therapy actively involves the patient in the therapy process, providing visual input that challenges and motivates the patient. Although biofeedback technique has been practiced in birthing centers throughout the United States, there had been limited documentation regarding the effectiveness of biofeedback in obstetrics. Nevertheless, the utilization of this intervention is well documented in other health fields. In physical therapy for example, the uses of biofeedback in treating certain conditions have been widely employed. As a tool for muscle re-education, electromyographic (EMG) muscle biofeedback measures the electrical activity created by muscle contractions. The goal of EMG biofeedback is to train subjects to increase, decrease, or stabilize muscle tension. Biofeedback is provided through proportional changes in a moving meter, bar graph, polygraph display, or an auditory tone. Training patients to increase EMG activity above a predetermined criterion is used clinically during muscle rehabilitation, where patients are encouraged to increase muscle activity of weak or flaccid limbs such as may result from a stroke or accident.
Another study conducted by Dr. Eric Altschuler and colleagues, from the University of California assessed whether a new mirror therapy can be used to help these patients regain movement in the limbs. Patients tried to move their hands or arms symmetrically while watching their good arm in the mirror. The said study reported that the mirror therapy provides patients with proper visual input because the reflection helps the patient think that their affected arm is moving correctly, hence stimulating the brain to help with nerve control of limb movement. The study suggested that this therapy may help to reverse elements of learned disuse of the affected limb.

Wong et al. (1997) chose 60 individuals with hemiplegia after stroke or traumatic brain injury and randomly divided them into the control or experimental group. All of the patients received therapy using a training table device intended to improve postural symmetry. The experimental group also received feedback about posture with the use of a mirror, while the control group did not receive any feedback. After 4 weeks of training, the group receiving feedback had a lower percentage of postural asymmetry.

In a more recent study under the guidance of Technol, researchers examined the effect of the use of a biofeedback device using a mirror in addition to physical therapy in training stroke patients with impaired sitting balance compared with outcome in patients receiving conventional physical therapy only. Biofeedback intervention, by providing visualization of postural trunk control, is a useful adjunct to conventional physical therapy in the rehabilitation of stroke patients with impaired sitting balance.

In another area of health care, real-time continuous visual biofeedback were employed in the treatment of speech breathing disorders following childhood traumatic brain injury (Murdoch, et al. p. 234-235). In this study, the efficacy of traditional and physiological biofeedback methods for modifying abnormal speech breathing patterns was investigated in a child with persistent dysarthria. The results of the study demonstrated that real-time continuous visual biofeedback techniques for modifying speech breathing patterns were not only effective, but superior to the traditional therapy techniques for modifying abnormal speech breathing patterns in a child with persistent dysarthria. These results show that physiological biofeedback techniques are potentially useful clinical tools for the remediation of speech breathing impairment in the paediatric dysarthric population.

Biofeedback has also been utilized for the treatment of stress and/or urge incontinence in cognitively intact patients who have failed a documented trial
of pelvic muscle exercise (PME) training. In this study, biofeedback was not a given as the main treatment, per se, but a tool to help patients learn how to perform PME. Biofeedback-assisted PME incorporates the use of an electronic or mechanical device to relay visual and/or auditory evidence of pelvic floor muscle tone, in order to improve awareness of pelvic floor musculature and to assist patients in the performance of PME. There has also been some interest in using biofeedback re-education to treat other musculoskeletal conditions including, but not limited to spasmodic torticollis, decreasing blepharospasm (involuntary eye blinking), bruxism, TMJ disorder and training to enhance retention in fecal and urinary incontinence.

However, in the study conducted by Bradley et al. (1998) the effects of electromyographic (EMG) biofeedback training on the recovery of gait in the acute phase (4 – 6 weeks) post stroke were examined. At follow-up, there was no difference in the rate of improvement between groups.

In 1996, Kohlmeyer set out to evaluate the effectiveness of biofeedback and electrical stimulation on the recovery of tenodesis grasp in tetraplegic individuals during the initial phase of acute rehabilitation. Based on the author’s conclusion, biofeedback and electrical stimulation alone or in combination did not offer any advantages over conventional rehabilitation treatment of wrist extensors in tetraplegic patients after spinal cord injury.

With reference to the study conducted, 13 patients with post-stroke hemiplegia were enrolled to determine whether the addition of visual biofeedback/forceplate training could enhance the effects of other physical therapy interventions on balance and mobility following stroke. While both groups showed some improvement following the four weeks of physical therapy, no additional effects were demonstrated in the group that received visual biofeedback/forceplate training in combination with other physical therapy.

While there have been different views regarding the value of biofeedback in other specializations, the researchers aim to establish its relevance in the field of maternal and obstetric nursing through this study.

**SIGNIFICANCE OF THE STUDY**

Biofeedback is a technique to reveal to human beings some of their internal physiological events, be they normal or abnormal, in the form of visual or auditory signals in order to teach them to manipulate these otherwise involuntary or unfelt events.
Visual biofeedback is a technique currently utilized in other fields of health care. This study will benefit the nursing profession as a whole in the sense that it will create an awareness of the feasibility of the use of visual biofeedback in the delivery room setting.

Incorporating visual biofeedback to the traditional intervention such as coaching would create less strenuous and consequently efficient delivery; thereby minimizing mother and child complications otherwise brought about by a prolonged labor process.

This study will benefit the primiparous women, as they are exposed to the availability of the option to use the suggested biofeedback technique during childbirth. Second, the unborn child in the mother’s womb will have better chances of surviving the extra-uterine life since the said technique would foster lesser risk of complications such as hypoxia and meconium staining, infection and possible death.

Furthermore, the mother will experience less difficulty and stress as a corollary of a prolonged labor process. Also the delivery room staff will benefit by the shorter wait brought about by a shorter labor process.

**OBJECTIVES OF THE STUDY**

This study aims to determine the effectiveness of visual biofeedback in hastening stage II of labor between primiparous women administered with adjunct intervention and those who were not.

Specifically, this study sought to determine if there is a difference in the length of stage II of labor between the control and experimental groups.

**SCOPE AND LIMITATION**

This study focused on the effectiveness of using visual biofeedback as a new technique in hastening the stage II of the labor process. This study was conducted for 14 days.

The group of women studied were primiparous with no fetopelvic disproportion, no fetal malposition or malpresentation, no multiple pregnancy, and none treated with heavy sedation, oxytocin, or operative intervention; uterine contractions are regular and of adequate intensity, all had a normal pelvis and were at term with a vertex presentation and delivered averaged sized infants.
The constraint of the study involved the unpredictability in the number of deliveries by primiparous women at the Cebu City Medical Center which translated to low sample population.

**HYPOTHESIS**

There is no difference in the length of stage II of labor between the control and experimental groups.

**MATERIALS AND METHODS**

**RESEARCH LOCALE**

Subject selection and data collection took place at Cebu City Medical Center (CCMC) located at Panganiban Street corner N. Bacalso Avenue, Cebu City. This public hospital, catering to the needs of Cebu City residents, houses a delivery room which offers services to pregnant women belonging to the lower socio-economic bracket. This facility was chosen as the place to conduct this research due to its high number of referrals and admissions.

The labor and delivery room are located at the right wing of the second floor adjacent to OB ward. The labor room, consisting of 2 adjoining quarters, houses 5 beds that can accommodate as many as 10-15 clients. The delivery room is suited to handle two simultaneous deliveries.

**RESEARCH DESIGN**

This quasi-experimental study, with a control group, tested the effectiveness of employing biofeedback among primipara clients undergoing stage II labor. No randomization was done in obtaining sample population.

Non-equivalent post-test only design was employed in measuring the effectiveness of the intervention administered.

**RESEARCH SAMPLE**

The target population included 20 primiparous women undergoing the second stage of the labor process. The second stage of labor starts from full cervical dilatation and effacement to delivery of the baby. A purposive sampling of women meeting the inclusion criteria was done. A sample of 20 had the capability of providing preliminary evidence as to the effectiveness of the intervention given to the experimental group.
RESEARCH INSTRUMENTS

This quasi experimental research utilized the following instruments: a 3 x 2 foot mirror to provide visual biofeedback (treatment), a stopwatch to measure the length of time elapsed from full cervical dilatation and effacement to the delivery of baby, and a tally sheet for recording of data. Direct observation was employed throughout the course of the experiment.

RESEARCH PROCEDURE

A.1 PREPARATORY STAGE

Ethical approval was secured from the institution where the study is to be conducted.

A.2 IDENTIFICATION OF RESEARCH SAMPLES

A purposive sampling plan was utilized to select target population in two groups of equal size. Inclusion criteria required that clients are primiparous and are planning to deliver via normal spontaneous vaginal delivery (NSVD). The clients selected represented a variety of ages, socio-economic status, and educational levels in the general community. After the pre-interview, the population sample was established. The first 10 clients were considered as the experimental group (administered with mirror intervention), while the next 10 clients were designated under the control group (conventional only). Signed informed consent was obtained from all intervention participants prior to the experiment.

B. ADMINISTRATION OF TREATMENT

Once clients have achieved full cervical dilatation and effacement per doctor’s confirmation, administration of the treatment will be initiated. This research utilized a 3 x 2 foot mirror held overhead and directed towards the perineum providing the client a full view of the progress of the entire birthing process.

C. DATA COLLECTION

The length of the stage II of labor of both groups as measured from the time of full cervical dilatation and effacement to delivery of the baby was
noted using a stopwatch. Data was then recorded using a tally sheet.

D. DATA COLLATION AND STATISTICAL TREATMENT

Collected data was analyzed statistically using t-test of mean difference to determine the significant disparity between the two groups. Statistical results were interpreted and documented.

RESULTS AND DISCUSSIONS

The table shows that the control group obtained the mean of 18.923 while the experimental group obtained a mean of 6.774 with a mean difference of 12.149. The standard deviation of the control group is 7.166 while 5.240 for the experimental group. The computed t-test value is 4.37, which was greater than the table value of 2.228 tested at 0.05 level of significance two tailed. Thus, the null hypothesis of no significance is rejected. The rejection of the null hypothesis implies that there is a remarkable decrease in length of stage II labor process.

Table 1. Summary table of the duration of stage II labor of the control and experimental groups

<table>
<thead>
<tr>
<th>SUBJECTS</th>
<th>CONTROL GROUP Duration of Stage II Labor in Minutes</th>
<th>EXPERIMENTAL GROUP Duration of Stage II Labor in Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25.08</td>
<td>3.50</td>
</tr>
<tr>
<td>2</td>
<td>24.08</td>
<td>6.47</td>
</tr>
<tr>
<td>3</td>
<td>25.93</td>
<td>20.83</td>
</tr>
<tr>
<td>4</td>
<td>26.25</td>
<td>3.83</td>
</tr>
<tr>
<td>5</td>
<td>14.15</td>
<td>10.30</td>
</tr>
<tr>
<td>6</td>
<td>24.50</td>
<td>8.17</td>
</tr>
<tr>
<td>7</td>
<td>10.23</td>
<td>4.67</td>
</tr>
<tr>
<td>8</td>
<td>10.40</td>
<td>1.95</td>
</tr>
<tr>
<td>9</td>
<td>21.43</td>
<td>4.30</td>
</tr>
<tr>
<td>10</td>
<td>7.18</td>
<td>3.72</td>
</tr>
</tbody>
</table>
Table 2. Summary table of the significant difference of the duration of stage II labor of the control and experimental groups

<table>
<thead>
<tr>
<th>Group</th>
<th>X</th>
<th>SD</th>
<th>Mean difference</th>
<th>t-test value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>18.923</td>
<td>7.166</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experimental</td>
<td>6.774</td>
<td>5.240</td>
<td>12.149</td>
<td>4.33</td>
<td>Reject $H_0$</td>
</tr>
</tbody>
</table>

The researchers sought to investigate whether there is a significant difference between the duration of stage II labor process of the control group and the experimental group that employed the adjunct mirror intervention.

The individual duration of stage II labor of the control and experimental groups were tabulated accordingly in Table 1. By simple observation of the study’s results, one could readily note the apparent difference in the length of the labor process (Stage II) between the samples from both groups. Statistical treatment using t-test of mean difference further reinforced this observation as evident in Table 2. The data gathered from the experiment consistently showed a marked variation in the duration. Although this study used a small population size, it provided ample evidence regarding the effectiveness of the said intervention applied in the field of maternal and child nursing. The results established that the use of visual feedback in maternal nursing is as effective as used in other disciplines as proposed by the study conducted under the guidance of Technol, wherein there was a significant effect with the use of visual feedback using the mirror in stroke patients with impaired sitting balance compared with the outcome in patients receiving conventional physical therapy.

The outcome of the study was further supported by the works of Dr. Eric Altschuler, et al. which assessed the use of new mirror therapy in helping patients regain movement in the limbs. The said study reported that the mirror therapy provides patients with proper visual input because the reflection helps the patient think that their affected arm is moving correctly, hence stimulating the brain to help with nerve control of limb movement.

Biofeedback used in this study employed the same modality and principle applied in other sciences. As reflected in the study, the visual feedback provided by the mirror becomes an immediate and continuous source of
visualization of the birthing process thus affirming the mother’s correct effort of “bearing down” resulting to ease of delivery hence, shortening the duration in stage II of labor.

Based on the results of this study, the researchers affirm the findings of previous studies adopted by other health sciences that visual feedback is indeed a useful tool in monitoring patients with motor performance through the use of sensory modalities, in this case, visual feedback to reinforce correct motor behavior.

CONCLUSION

Based on the findings of the study, utilization of a mirror as an instrument in providing visual feedback to the mothers on the second stage of labor reduces the length of this stage providing an effective adjunct intervention

RECOMMENDATIONS

This study provides preliminary evidence as to the effectiveness of the visual feedback: adjunct mirror intervention in hastening stage II labor among Primiparous women.

The future researchers shall conduct a more comprehensive study using a bigger sample size that is representative of the whole population and taking into consideration other factors like weight, socio-economic status, activity level during pregnancy, diet, life-style, obstetric and healthy history of mother. This research will also serve as a reference guide for future related studies.

Health institutions and health professionals rendering obstetric care must become aware of the relevance of this study and apply the proposed technique in their pursuit of continuous development of their services.

This research will also serve as a reference guide for future related studies.

NOTE: Pursuant to the international character of this publication, the journal is indexed by the following agencies: (1) Public Knowledge Project, a consortium of Simon Fraser University Library, the School of Education of Stanford University, and the British Columbia University, Canada; (2) E - International Scientific Research Journal Consortium; (3) Journal Seek - Genamics, Hamilton, New Zealand; (4) Google Scholar; (5) Philippine Electronic Journals (PEJ); and, (6) PhilJol by INASP.
LITERATURE CITED


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Music on the Second Stage of Labor among Women in their First Pregnancy

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Abstract - This study determined the effects of music on the duration of the second stage of labor among primigravida or women in their first pregnancy at Cebu City Medical Center. An experimental design was utilized in this study with experimental and control group. A random sampling was utilized with the following criteria considered: a) primigravida or women on their first pregnancy admitted at the Delivery Room; b) age bracket: 20-30 years old; c) no complications of pregnancy. All respondents had Normal Spontaneous Vaginal Delivery (NSVD). Each qualified respondent was chosen randomly to three conditions. A total of forty-five respondents (15 for classical music group, 15 fast music group and 15 for silence or control group) was selected. The shorter the second stage of labor, the more effective is the treatment provided. Findings revealed that the group of mothers who had no music has the shortest duration of the second stage of labor, followed by the group using fast music and the longest duration was that of the
group using slow music. ANOVA computation was done which was significant at p=.05. Scheffe’s Test further showed that fast music is more effective in hastening the second stage of labor than slow music and a significant difference between the slow music group and the no music group was also identified.

INTRODUCTION

The phenomenon of delivering a baby is considered as one of the oldest manifestations of the physiological wonders in the medical field. The process of labor, which is basically characterized by back pains and lower abdominal pains which accompany uterine muscle contractions has been the subject of study of different researchers focusing more on how to reduce pain during labor. It is indeed necessary to study this phenomenon of labor since pregnant women are subjected to a lot of stress and fatigue and incidence of maternal mortality are observed due to the mother’s inability to withstand the rigors of labor. More so, when a mother approaches the second stage which is culminated by the delivery of the baby. Complications related to the delivery of the baby are caused by prolonged second stage of labor which can lead to the baby’s inability to acquire adequate oxygenation (hypoxia) and maternal exhaustion. Thus, it is the aim of the health team assisting the deliveries to hasten the second stage of labor.

The attitude of every health practitioner should constantly be the identifying means which are conventional in nature which will be utilized by mothers in their labor and delivery experiences. Nurses, whose focus of care is the prevention of complications and the emotional and psychological support for women in labor should innovate means to provide comfort to mothers before, during and after delivery. It is indeed ideal to determine means that do not need pharmacological nor surgical interventions for pregnant women because these entails possible side effects or adverse reactions and complications.

One alternative means of hastening the second stage of labor, which is the delivery of the baby, is on the use of music. The use of music in reducing labor pains and distress has been advocated by many birthing centers. It has been identified that music has calming effect on the woman in labor (Phumduong, 2003). On the other hand, experiences and studies identified that music do
not only have a calming effect but it motivates a person and increases his or physical ability (Ferguson, Carbonneau, & Chambliss, 1994). The presence of music tends to motivate women about to deliver the baby to increase their effort in pushing the baby and can contribute to the reinforcement which the health team is providing the mother.

Ancient stories tell that in times of war, battalions of soldiers were always accompanied by musicians or bands who played marching songs while the fighting took place to motivate and strengthen the soldiers to fight against their enemies. This suggests that music has a psychological effect in individuals and can energize one into action. It is on this aspect that the researchers anchored the assumption of this study that if music has such effect on individuals, it can also have the same effect to a mother who is going to exert effort to push her baby out for delivery, thus reducing the duration second stage of labor.

Based on the premise cited above, the researchers determined the effect of music on the duration of the second stage of labor.

**FRAMEWORK**

The delivery of a baby goes through a process of labor. Labor is the series of events by which uterine contractions and abdominal pressure expel the fetus and placenta from the woman’s body (Pillitteri, 2003). Regular contractions cause progressive dilatation of the cervix and sufficient muscular force to allow the baby to be pushed to the outside. It is a time of change, both an ending and a beginning, for the woman, the fetus and the family.

Furthermore, labor and birth require the woman to use all the psychological and physical coping methods she has available. Pregnant women are subjected to physiological discomforts and distress due to the pain experienced prior to the delivery of a baby. Labor is categorized into three stages: first stage of dilatation, begins with true labor contractions and ends when the cervix is fully dilated; second stage, starts from the time of full cervical dilatation until the infant is born; and a third stage or the placental stage, from the time the infant is born until the delivery of the placenta.

The successful delivery of the baby depends basically on the ability of a mother to push when full cervical dilatation has taken place. The bearing down is in most cases reflexive and spontaneous in the second stage of labor, but occasionally the mother needs to employ her expulsive forces to good advantage. Her legs should be half-flexed so that she can push with them.
against the mattress. Instructions should be to take a deep breath as soon as the
next uterine contraction begins and with her breath held, exert a downward
pressure exactly as though she were straining during bowel movement. At
this stage, mothers need to be cheered and reinforced so as to motivate her to
push harder. This activity involves a lot of physical activity and strength, as
well as, background motivation from the health team attending the delivery.

It is desirable that the second stage of labor should be shortened so as
not to cause injury and complications to the baby. It is on this factor that
interventions to shorten such stage should be innovated by health care
members.

A unique treatment is conceived about in shortening the delivery of the
baby such as music therapy. Literatures and studies cited that soft music is
effective in reducing distress and pain of women during labor (Phumduong
2003). But if soft music can have calming effect on women in labor, what could
be the effect of stimulating music to the behavior of a woman on the active state
of delivering the baby? According to Karageorghis & Terry (1997), music has
been widely recommended as a technique to enhance the psychophysical state
of individuals in sports and exercise. Their study suggests that appropriately
selected music can enhance enjoyment levels and adherence to physical
activity. (Kravitz 2004) reported that in the study conducted the introduction
of jazz music increases respiration and moderately increases heart rate which
prepares the students for the forthcoming workout. Delivering a baby is
metaphorically likened to a physical workout that has to be prepared for and
through music the mother can be physically prepared for the strenuous effort
of pushing the baby out.

Music is an ancient method for healing. In the year 550 B.C., Pythagoras from
Greece developed a concept for the use of music in medicine, esteeming music
higher than many other medical treatments. The Medical Resonance Therapy
Music (MRT-Music) of the German classical composer and musicologist Peter
Huebner is built on this concept of Pythagorean music medicine. Its therapeutic
effect may be best explained by the natural phenomenon of resonance between
the harmony laws of the microcosm of music and the biological laws of the
body. The study of Sidorenko (2000) showed results received after application
of MRT-Music indicate multiple positive effects on the organism of pregnant
women both with a healthy pregnancy as with a pathologic one, reducing
the rate of premature births very effectively. Furthermore, MRT-Music
came out to be an effective method in the complex therapy of late gestoses
and a nearly irreplaceable method for preoperative preparation of pregnant
woman for caesarean section. It demonstrated a powerful anti-stress effect and allowed to reduce the amount of administered pain-killers to pregnant women by the factor 1.5 to 2.0, thus reducing the negative pharmacological load to the foetus. It furthermore reduced labour time and shortened hospital stay. It helped to create optimal conditions for the course of pregnancy and heightened pain sensitivity threshold by means of improving the functional, hormonal, and psycho-emotional conditions of pregnant and lying-in women. Thus, the labour process became more natural, the delivery non-traumatic, and motherhood more happy and safe.

In the study of Clark, McCorkle & Williams (1981), a new clinical music therapy program was described for application in the labor and delivery setting, and presents results of a preliminary study to evaluate effectiveness of the treatment. Over 50 women participated in the project; however, inclusion of patients in the data collection portion of the project was limited by criteria designed to minimize the effects of spurious variables. An experimental group of 13 patients participated in six individual predelivery music therapy training sessions during the third trimester of pregnancy. Experimental patients listened to preselected musical works throughout labor and delivery, with the music therapist in attendance. A control group of seven subjects participated in labor and delivery according to regular hospital routines. Data consisted of patients’ responses to questionnaire items reflecting subjective perceptions and recollections of the labor/delivery experience and reports of frequency and duration of home practice. Experimental subjects achieved significantly higher “success” scores than did control subjects on five of seven indices (p less than .05). A moderate correlation between music home practice and successful childbirth outcome was demonstrated, with frequency/length of music home practice revealed as a significant predictor of success in the childbirth experience. In this study, it presents the labor and delivery experiences of the respondents in relation to music. It further identified that music has an effect on the labor and delivery of women.

The application of music in pain management has become popular in the past two decades. The study of Browning (2000) described the responses of primiparas to the use of music therapy during the births of their children. In the study, eleven women who attended childbirth education classes in Brantford, Ontario, Canada, volunteered to participate in a music therapy exercise. During pregnancy each participant selected preferred music, listened to it daily, and received instruction about focused listening. Within 72 hours after birth they were interviewed about their use of music as a coping strategy.
during labor. The findings revealed that women selected the combination of music and labor support as a helpful coping strategy during labor. All women used the music during labor to help distract them from the pain or their current situation. The study concluded that the planned use of music by mothers and caregivers can be an aid to prenatal preparation and an important adjunct in pain and stress management during labor and birth.

A study investigated the effects of rhythmic stimuli in the rehabilitation of gait disorders. Neuromuscular and skeletal disorders may seriously affect the quality of a person’s life by limiting a person’s daily functioning capacity and impeding mobility. Research has steadfastly demonstrated that external auditory cues, such as rhythmic music and percussion pulses favorably affects coordinated walking and proprioceptive control (Rudenberg 1982; Staum 1983). It has been suggested that the music or auditory stimuli improves gait regularity due in part to the use of the beat, which helps individuals to anticipate the desired rate of movement. This study implies that the use of music and auditory stimuli can be advocated to enhance a person’s physical capability and gross motors skills, leading to increased stability and mobility of the clients. In application to pregnant women, music can enable them to control effort in pushing the baby in consonance with contraction so as to effectively deliver the baby.

A study suggested that reaction to music depends on the type of music which the respondents are exposed to. In the study of Pearce (1981 as cited by Kravitz 2004) a comparison was made on the influence of stimulative music, sedative music, and silence (no music) on measured grip strength of subjects which consisted of 33 male and 16 female undergraduate students randomly assigned to the order of the three types of stimulation (stimulative, sedative, and silence). Analysis indicated that listening to sedative music decreased strength significantly when compared to stimulative music and silence. However, no statistically significant difference was seen between stimulative music and silence. This implies that stimulating music increases muscle tension while sedative music decreases muscle tension. This study further implies that since women in the second stage of labor needs to increase their strength and energy in pushing the baby, stimulative music is the choice of music which they should be exposed to.

Another investigation of submaximal intensity walking/jogging on a treadmill showed that subjects had longer times to exhaustion when listening to slow, soft music as compared to loud fast music (Copeland & Franks 1991 as cited by Kravitz 2006).
Most of the related literature consulted scanned were not specifically focused on labor but it is the focus of this study to investigate the effects of music on the shortening of the second stage of labor which involves physical activity and the motivation of the mother to exert effort to take part in the delivery. The studies and literature cited above focused mainly on the effects of music to the physical strength and capability of the respondents. The therapeutic values of music apply to many experiences in life.

**OBJECTIVES OF THE STUDY**

The basic task accomplished in this study was to determine the effects of classical or soft and fast or stimulative music on the duration of the second stage of labor among primigravida or women in their first pregnancy at Cebu City Medical Center.

**HYPOTHESIS**

Based on the literature reviewed, it is hypothesized that there is a significant effect of certain types of music (classical or soft and fast or stimulative) on the duration of the second stage of labor among primigravida.

**SIGNIFICANCE OF THE STUDY**

The results of this study will benefit the following:

**Pregnant Mothers.** This study will provide them assistance in the safe and easier delivery of their baby, thus avoiding complications to develop on the mother and on the infant.

**Medical Practitioners.** This will help them in lessening their burden of waiting for the delivery of the baby and will enable them to provide care to other patients.

**Nurses.** They will be able to help pregnant women in the provision of a non-pharmacological intervention in the easier delivery of infants, thus reducing their burden and stress of caring for a post-partum with complications.

**Limitation of the Study**

This study focused on the effect of types of music on the duration of the second stage of labor among women during the first pregnancy.

The respondents were limited to women ages 20 to 30 years old since
ages younger or older than the proposed age range are considered high-risk age of pregnancy and pose a number of labor complications which affect the validity of the study. Furthermore, this study focused on normal deliveries since pathologic deliveries are expected to have prolonged labor duration due to pathological complications. Furthermore, women who are on pathologic labor process will not be receptive to environmental stimulations since most of them are either sedated or placed on anesthesia for cesarean section.

MATERIALS AND METHODS

This section includes research design, research locale, research sampling, research procedure and measurement of variables.

Research Design

A quasi-experimental design, specifically non-equivalent control group post test only design, was utilized in this study with experimental and control group. The treatment utilized in this study was the music therapy which was classified into two: classical or soft music and stimulating or fast music, and this also served as its independent variables. The dependent variable was the duration of the second stage of labor from the full cervical dilatation to the delivery of the baby which were measured in minutes. The median duration of the second stage (from complete dilatation of the cervix to delivery) is 50 minutes in nulliparas and 20 minutes in multiparas, but it can be highly variable.

Research Locale

This study was done in the Delivery Room of Cebu City Memorial Medical Center, Cebu City. This hospital caters to patients coming from the city of Cebu.

Research Sampling

A random sampling was utilized with the following criteria considered: a) primigravida or women on their first pregnancy admitted at CCMC Delivery Room; b) age bracket: 20-30 years old; c) no complications of pregnancy. All respondents had Normal Spontaneous Vaginal Delivery (NSVD). Each qualified respondent was chosen randomly and assigned randomly to three conditions. A total of forty-five respondents (15 for classical music group, 15 fast music group and 15 for silence or control group) were selected. The random selection of respondents was done in all three shifts.
Research Instrument

In order to introduce the treatment of this study, the researchers used an audio component and the compact disc player for the music which were played through headphone once the doctor announced a full cervical dilatation. To measure the duration of the second stage of labor, the researchers utilized a stopwatch which determined the gap between the full cervical dilatation to the expulsion of the fetus in minutes. The shorter the second stage of labor, the more effective is the treatment provided. The same stopwatch was used for all respondents.

Research Procedure

This study commenced once the researchers obtained the permit from the CCMC Chief Officer. The researchers stayed at the Delivery Room of CCMC to screen the possible respondents of the study. An informed consent was obtained from the respondents before they can be considered as part of the study.

To control extraneous variables, the following conditions were fulfilled: a) the music started upon full cervical dilatation or when cervical dilatation has reached approximately 10 centimeters and this was played at a duration of 30 minutes for both classical music and fast music group; b) the same audio component was played for all respondents and the same set of volume and amplitude was imposed; c) the data were gathered throughout the whole shifts (5 for 7:00am to 3:00 p.m.; 5 for 3:00 pm to 11:00 pm; 5 for 11:00 pm to 7:00 am) to control the effects of environmental noise; d) only one respondent was tested every session even if there was more than one case simultaneously in second stage of labor. Other cases were not included in the study. In timing the duration of the second stage of labor, the researchers assigned three members of the team who acted as timekeepers using a stopwatch and the result of the three timers were averaged to get the final duration per patient.

Statistical Treatment of Data

A One-way Analysis of Variance (ANOVA) was used to determine the significant difference in the duration of the second stage of labor between control and experimental groups. Statistical results were interpreted as significant at 0.01 level of significance.
RESULTS AND DISCUSSION

The findings of the study are presented based on the main problem of the study. Table 1 shows the group means of the group using fast music, slow music and no music at all in minutes which shows the duration of the second stage of labor.

Table 1. Use of music, means of three groups

<table>
<thead>
<tr>
<th>Group</th>
<th>N (Group Count)</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fast Music</td>
<td>15</td>
<td>16.8</td>
</tr>
<tr>
<td>Slow Music</td>
<td>15</td>
<td>35.87</td>
</tr>
<tr>
<td>No Music</td>
<td>15</td>
<td>14.8</td>
</tr>
<tr>
<td>Total</td>
<td>45</td>
<td>22.49</td>
</tr>
</tbody>
</table>

From among the three groups, it is clearly noted that the group of mothers who had no music has the shortest duration of the second stage of labor, followed by the group using fast music and the longest duration was that of the group using slow music. This findings imply that the usual environment in the delivery room without the influence of music promotes shorter duration of labor. Yet, it should be noted that the group with fast music also shows a shorter duration which shows a closer mean value with that of the no music group. Furthermore, findings imply that the type of music plays a role in the shortening of the second stage of labor favoring the fast music.

Based on the results, it is further analyzed that the reason for the shorter duration of labor among mothers in the no music group could be attributed to the fact that the respondents were not totally deprived of any sound since they were not made to wear earphones to block the noises but this could be due to the health team’s voices and verbalizations of either positive or negative reinforcements to hasten the labor process. Furthermore, the researchers also entertained the possibility that the respondents in the fast and slow music may have felt self-conscious with the earphones in place thus affecting their reactions to the labor process.

To determine the significance of the difference between the three groups, Table 2 shows the ANOVA results.
Table 2. Test of difference using one ANOVA on the effects of music on the duration of labor

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
<th>Significance</th>
<th>Levene Statistic</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>4056.7</td>
<td>2</td>
<td>2028.3</td>
<td>14.91</td>
<td>.00</td>
<td>22.13</td>
<td>00</td>
</tr>
<tr>
<td>Within Groups</td>
<td>5712.5</td>
<td>42</td>
<td>136.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>9769.2</td>
<td>44</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As per computation of the F-value, it is noted at 14.91 with the computed level of significance at .00. This result implies that the null hypothesis is rejected, thus the difference in the duration of the second stage of labor is significant. The test of homogeneity shows a Levene’s statistic of 22.13 with a p-value of .00 which makes the researchers assume that the variances of the populations from which the samples were drawn are equal.

These findings support the studies of Rudenberg (1982) and Staum (1983) which states that the auditory stimuli perceived by individuals tend to affect their physical strength and gait. In this study, music has shown a significant influence on the second stage of labor which implies that music has really an effect on the motivation and strength of a person to mobility such as a woman in labor.

In order to determine which groups differ significantly from each other, a multiple comparison was computed using Scheffe’s Test as shown in Table 3.

Table 3. Multiple comparisons based on post hoc analysis of fast, slow and no music groups

<table>
<thead>
<tr>
<th></th>
<th>Mean Difference</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fast slow</td>
<td>-19.07*</td>
<td>.00</td>
</tr>
<tr>
<td>No music</td>
<td>2.0</td>
<td>.89</td>
</tr>
<tr>
<td>Slow fast</td>
<td>19.07*</td>
<td>.00</td>
</tr>
<tr>
<td>No music</td>
<td>21.07*</td>
<td>.00</td>
</tr>
<tr>
<td>No music fast</td>
<td>-2.0</td>
<td>.89</td>
</tr>
<tr>
<td>Slow slow</td>
<td>-21.07*</td>
<td>.00</td>
</tr>
</tbody>
</table>

* The mean difference is significant at .05.
From the table, it is gleaned that the type of music used has significant difference which indicates that fast music is more effective in hastening the second stage of labor than slow music. There was also a significant difference between the slow music group and the no music group. This implies that no music is more effective than slow music. But between fast music and no music there is no significant difference noted. The findings are supported by the study of Pearce (1981) in which greater strength is noted when respondents were subjected to stimulative or fast music than slow music. It was noted in the study that when respondents were subjected to slow music they tend to show reduction of strength. However, the same observation was noted in the study that there was no difference noted between stimulative music group and the silent group.

**CONCLUSION**

It is concluded that fast music aids women in labor to hasten the second stage of labor.

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