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Effect of music therapy on pain during first stage of labour among Primi parturient mothers in Kasturba Gandhi hospital for women and children, Chennai

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Abstract

Pain in childbirth is a universal experience and considered as a normal occurrence. Understanding the cause and characteristics of pain in the labour room will help the nurse to provide care for the women in labour process. Non-pharmacological management of labour includes mental stimulation, thermal stimulation, and cutaneous stimulation (Campman & Durham, 2010). The objectives of this study were to: (1) To assess the level of pain among Primi parturient mother during the first stage of labour in the intervention group and control group, (2) To assess the effectiveness of music therapy during the first stage of labour in terms of pain reduction in the intervention group compared to control group. Method: The study was conducted among 30 primi parturient mothers in Kasturba Gandhi Hospital for Women and Children, Chennai District, Tamil Nadu. Primi parturient mothers were assessed by using tools like Socio-demographic proforma, Clinical variables, Maternal physiological parameters – vital signs, FHR, and Labour pain was assessed by Numerical pain rating scale. The result of the present study found that there is no significant mean difference in pre-test concerning pain level of intervention and control group ($p > 0.05$). whereas in post-test 1 the mean pain level in the intervention group was 6.53 which is less than the control group 7.06 (mean difference 0.53). In post-test 2 the mean pain level in the intervention group was 6.60 which is less than the control group 8.86 (mean difference 2.26). This finding revealed that music therapy was effective in the reduction of pain at $P < 0.05$. To conclude a music therapy was effective in reducing pain during the first stage of labour among Primi parturient mothers. Thus, it can implement as non-pharmacological therapy to reduce labour pain.

Keywords: Music therapy, Primi parturient mothers, maternal physiological parameters, pain level

Introduction

As the women progress through childbirth, numerous physiologic responses occur to adapt to the laboring process. Maternal physiological responses includes; heart rate increases by 10 to 20 bpm, cardiac output increases by 10% to 15% during the first stage of labour and by 30% to 50% during the second stage of labour, blood pressure increases by 10 -30 mm of hg during uterine contractions in all labour stages, the white blood cell count increases to 25,000 to 30,000 cells/ mm³ perhaps as a result of tissue trauma, respiratory rate increases and more oxygen is consumed related to the increase in metabolism, gastric motility and food absorption decrease, which may increase the risk of nausea and vomiting during the transition stage of labour, gastric emptying and gastric PH decrease, increasing the risk of vomiting with aspiration, body temperature rises slightly, possibly due to an increase in muscle activity, muscular aches/ cramps occur as a result of the stressed musculoskeletal system, basal metabolic rate increases and blood glucose levels decrease because of the stress of labour (Ricci, 2009) [7].

Pain is a basic protective mechanism that alerts a person that something threatening is happening somewhere in the body. The sensation of pain begins in nociceptors, the endpoint of afferent nerves when they are activated by mechanical, chemical, or thermal stimuli. Nociceptors are located predominantly in the skin, bone periosteum, joint surfaces, and arterial walls. When these end terminals are stimulated, chemical mediators such as prostaglandins, histamine, bradykinin, serotonin are synthesized and help to transmit the pain impulse along small and unmyelinated C fibers and large, myelinated A-delta fibers to the spinal cord. The more numerous C fibers conduct slowly and carry dull, low-level pain, the fewer A-delta fibers carry sharp, well-localized pain such as labor contraction. (Pillitteri & Pillitteri, 2010) [6].

Melzack and Wall, (1965) gate control theory of pain control is the most widely accepted theory of pain response, proposes that pain can be halted at three points: the peripherals end terminals, the synapse points in the dorsal horn, or the point at which the impulse is interpreted as pain in the brain cortex (Pillitteri & Pillitteri, 2010) [6]. Many factors contribute to the client's emotional response to birth. Lack of knowledge, fear of pain, personal or family stress, lack of labour support from a significant other, degree of self-confidence, feelings of loss of control, negative attitudes about birth, cultural background, and concerns for personal safety can all serve to block labor's progress (Goodman *et al.*, 2004; Turley, 2004).

Pain is perceived differently by different individuals because of psychosocial, physiologic, and cultural responses. The body's ability to produce and maintain endorphins (naturally occurring opiate-like substances) may influence a person's overall pain threshold and the amount of pain a person perceives at any given time. Women who come into labour believing the pain will be horrible are usually surprised afterward to realize that the agony they expected never materialized. On the other hand, women who thought that pain would be minimal can be overwhelmed by its intensity. Patterns of interventions are there to promote comfort and manage pain in labor has swung from a philosophy of no intervention to a philosophy that drug intervention was required, to a modern approach of empowering women and their partners with information so that they can choose how to best relieve pain during labour, within the limits of medical safety (Pillitteri and Pillitteri, 2010) [6].

Nurses play a key role in educating women and their support persons about the numerous comfort and pain relief strategies available and making sure couples understand the choices available to them along with the benefits and risks (Pillitteri and Pillitteri, 2010) [6]. The nurse should give support to the mother, give an explanation and encourage the mother to concentrate on relaxation techniques during first stage of labour. Advise the mother not to push down during first stage of labour because it causes cervical laceration and fetal hypoxia (Bhaskar, 2014) [1].

Tintu Xavier, Lekha Viswanath (2016) [8] was conducted a quasi-experimental study on the effect of music therapy on Labour pain among women in active labour among 40 women in an active stage of labour, with cervical dilatation of 4-7cm admitted in tertiary care hospital, Kochi. The first 20 women were allotted to the control group and the next 20 to the experimental group to avoid contamination. Semi-structured interview and record review was used to collect background information and a visual analogue scale was used to measure pain and anxiety. Results show that the mean post-test pain score of the experimental group (7.9) was significantly lower than the posttest score of the control group at 30th minute (5.75+/- 0.44 vs 8.55+/- 0.51, $P < 0.001$) and 60th minute (7.9 +/- 0.45 vs 8.7+/- 0.47, $P < 0.001$). No difference was observed in uterine contraction between the groups. The mean anxiety score of the experimental group was lower than the control group ($P < 0.001$)

The above study supports that music therapy is effective in reducing the pain and anxiety of women in labour without affecting uterine contractions. Thus, music can be used as a non-pharmacological pain management measure for providing comfort during labour. Hence, the researcher felt

the need of assessing pain during first stage of labour among primi parturient mothers.

Aim and Objectives

The present study is aimed to assess the level of pain during first stage of labour among primi parturient mothers in Chennai, Tamilnadu. The objectives of this study were to: (1) To assess the level of pain among primi parturient mother during first stage of labour in the intervention group and control group, (2) To assess the effectiveness of music therapy during the first stage of labour in terms of pain reduction in the intervention group compared to control group.

Materials and Methods

Quasi-experimental design, non-randomized control group design was applied to find the effect of music therapy in pain reduction during the first stage of labour among primi parturient mothers. The study was conducted in October 2020. The study consists of 30 primi parturient mothers during first stage of labour and who are admitted to the labour room of Kasturba Gandhi Hospital for Women and Children, Chennai. The present study included primi parturient mothers who have completed 37 weeks of gestation, with a singleton pregnancy, with vertex presentation, and who are in the latent phase. Purposive sampling technique was used to select the subjects who met the inclusion criteria. Thus, the first 15 were allotted in the control group and another 15 were in the interventional group to avoid contamination.

The present study was conducted after getting approval from Madras Medical College Institutional Ethical Committee. Primi parturient mothers were enrolled after getting informed consent. The researcher explained about the intervention and data were collected by using tools like Socio-demographic proforma, clinical variables, and Vital signs, and FHR were collected through observation method. The numerical pain rating scale was used to assess pain during labour which is a subjective pain assessment tool that comprises points from 0-10. The pain score is classified into 0= no pain, 1-3= mild pain, 4-6= moderate pain, and 7-10= severe pain. The reliability in terms of internal consistency of pain scale is analyzed by Cronbach's Alpha $r=0.89$ indicates highly reliable.

Pre-test pain level was assessed at 1-3 cm of cervical dilatation in the intervention group and control group. Music therapy was administered to the intervention group at 4-5 cm of cervical dilatation for 20 minutes and the second session of music therapy at 6-7 cm of cervical dilatation for 20 minutes. After each intervention post-test I and post-test II pain score were assessed. The Control group received routine care and the Post-test was assessed after 20 minutes at 4-5 cm of cervical dilatation and 6-7 cm dilatation respectively. Data analysis in terms of descriptive and inferential statistics was performed using SPSS v.20.

Results

The demographic data shows that the age of primi parturient mothers ranges between 18-34 years, were about 53.3% of mothers in the intervention group and 40% of mothers in the control group belonged to 22-25 years of age group. Regarding education, 40% of mothers in the intervention group have a degree and above, whereas mothers in the control group have 33.3% of primary education. In both,

groups all of them were housewives (100%). In religion, 60% of mothers in the intervention group and 87% of mothers in the control group were Hindus. In the type of family, the majority 73% of mothers in the intervention group belong to a joint family and on contrary, 67% of mothers in the control group belong to a nuclear family. But, in both groups about 67% of mothers were from the urban community. In both the intervention and control group, the major proportion had a non-consanguineous marriage which is 80% and 93% respectively. In the duration of married life majority 73% of mothers in the intervention group and 53% in the control group reported the duration of the marriage is less than one year. The majority 80% of mothers in the intervention group and 73% of mothers in the control group has opinioned as mother is

the support person. Remarkably, in both the groups, all of them (100%) were opinioned as leading satisfactory marital relationship, pregnancy is planned, attended antenatal counseling, registered their pregnancy and not practicing complementary therapy.

Moreover, the clinical variable shows that the mothers of both groups were between 37-40 weeks of gestation. The majority 60% of mothers in the intervention group and 67% in the control group had 7-9 antenatal visits. Also shows that the majority 73% of mothers in the intervention group and 93% of mothers in the control group were had induction of labour and augmentation of labour for 80% of mothers in the intervention group and 100% of mothers in the control group.

Table 1: Distribution of clinical variables of primi parturient mothers in the intervention group and control group. N = 30

Variable	Intervention group (n=15)		Control group (n=15)		t-value	p-value
	Mean	SD	Mean	SD		
Number of Antenatal Visit	3.26	0.593	3.40	1.242	0.375	0.710
Haemoglobin level in grams	11.36	0.900	11.20	1.101	0.471	0.680
Height in cm	154.60	7.452	153.93	4.317	0.300	0.767
Weight in kg	60.80	8.072	61.06	7.648	0.093	0.927
BMI	25.51	3.688	25.82	3.523	0.232	0.818

The clinical variables exhibit that, the mean hemoglobin level of mothers in the intervention group is 11.36 and in the control group is 11.20. Further, the mean Height, Weight, and BMI in the intervention group were 154.6, 60.80, and 25.51 respectively. Similarly, the mean Height, Weight, and

BMI in the control group were 153.93, 61.06, and 25.82 respectively. It shows that there is no significant mean difference in pre-test concerning clinical variables of intervention and control group ($p>0.05$) (table 1).

Table 2: Distribution of maternal physiological parameters of primi parturient mothers in the intervention group and control group. N = 30

Variable	Intervention group (n=15)		Control group (n=15)		t-value	p-value
	Mean	SD	Mean	SD		
Body temperature	98.53	0.097	98.56	0.112	0.695	0.493
Pulse rate	82.26	3.692	82.13	3.961	0.095	0.925
Respiratory rate	16.00	0.755	16.13	0.915	0.435	0.667
Systolic blood pressure in mmhg	114.00	7.367	115.06	7.245	0.400	0.692
Diastolic blood pressure in mmhg	74.66	5.163	75.46	6.523	0.372	0.712
Foetal heart rate	148.53	4.501	144.80	6.085	1.910	0.066

The pre-test maternal physiological parameters like vital signs and foetal heart rate show that the mean body temperature, pulse rate, and respiratory rate in the intervention group were 98.53, 82.26, and 16 respectively. Similarly, the mean body temperature, pulse rate, and respiratory rate in the control group were 98.56, 82.13, and 16.13 respectively. However, the mean systolic and diastolic

blood pressure in the intervention and control group was 114, 74.66, and 115.06, 75.46 respectively. Followed by, the mean foetal heart rate in the intervention group was 148.53 and the control group was 144.8. It shows that there is no significant mean difference in pre-test concerning maternal physiological parameters in the intervention and in the control group ($p>0.05$) (table 2).

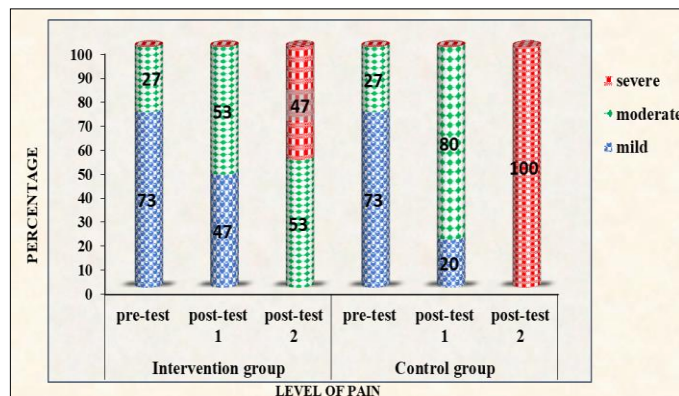


Fig 1: Bar diagram shows the percentage distribution of pain of Primi parturient mothers in the intervention and control group during the pre-test, post-test 1, and post-test 2

The level of pain during the pre-test shows in both groups majority 73% of mothers had mild pain and the remaining 27% of mothers had moderate pain. Followed by in post-test 1, in the intervention group, 53% of mothers had moderate pain and 47% of mothers had mild pain. In the control group

majority 80% of mothers had moderate pain and at least 20% of mothers had mild pain. Further in post-test 2 shows that 53% of mothers in the intervention group had moderate pain and 47% of mothers had severe pain. In the control group, all of them (100%) reported severe pain (figure 1).

Table 3: Comparison of pain scores of Primi parturient mothers in the intervention group and control group N=30

Pain level at assessment	Intervention group (n=15)		Control group (n=15)		Mean difference	t-value	p-value
	Mean	SD	Mean	SD			
Pre-test	3.06	.703	3.26	.457	0.20	0.923	0.364
Post-test1	6.53	.516	7.06	.703	0.53	2.366*	0.025
Post-test 2	6.60	.736	8.86	.516	2.26	9.757**	<0.01

*Significant at $P<0.05$, **Significance at $P<0.01$

The effect of music therapy during the first stage of labour among primi parturient mothers in terms of pain was analyzed by an independent t-test. The mean pre-test pain score in the intervention and control group was 3.066 and 3.266 respectively. The present study reveals that there is no significant mean difference in pre-test pain level in both groups ($p>0.05$). Further in post-test 1, the mean pain score in the intervention group was 6.53 which is less than the control group 7.06 (mean difference 0.53). This revealed that music therapy is effective in pain reduction in terms of significant mean difference $t=2.366$ ($P<0.05$). Similarly, in post-test 2 the mean pain score in the intervention group and control group was 6.60 and 8.86 respectively (mean difference 2.26). The present study revealed that the pain score in the intervention group was significantly lower than the control group at $P<0.01$ (table 3).

Discussion

Complementary and alternate therapies for pain relief involve non-pharmacologic measures that may be used either as a women's total pain management program or to complement pharmacologic interventions. Pharmacologic measures for pain relief during labor include analgesia and anesthesia which causes a complete loss of sensation. It includes narcotic analgesia, lumbar epidural block, pudendal block, Local infiltration of the perineum, and general intravenous anesthetics (Pillitteri and Pillitteri, 2010) [6].

Non-pharmacologic management includes music therapy, Reflexology, meditation, Relaxation, Breathing techniques, Aromatherapy, Hot and cold therapy, Hydrotherapy, and Transcutaneous electronic nerve stimulation (Lowdermilk *et al.*, 2006) [5].

The present study was conducted among 30 primi parturient mother who have completed 37 weeks of gestation, with a singleton pregnancy, with vertex presentation, and who is in the latent phase. A purposive sampling technique was used to select the study subjects. The first 15 were included in the control group and another 15 in the intervention group. The findings show that in post-test 1 the mean pain score in the intervention group was 6.53 which is less than the control group 7.06. This finding supports that music therapy is effective in pain reduction in terms of significant mean differences ($P<0.05$). In post-test 2 the mean pain score in the intervention group and control group was 6.60 and 8.86 respectively. The present study revealed that the pain score in the intervention group was significantly lower than the control group at $P<0.001$.

The present study findings were supported by a true experimental study to assess effectiveness of music therapy in labour pain reduction among primigravida mothers in first stage of labour in selected hospitals at Udaipur, Rajasthan. The study was conducted among 60 primigravida

mothers 30 experimental and 30 control group who are in first stage of labour was selected by using simple random sampling technique. Result shows that, the mean score of post-tests in experimental group 7.23 (24.01%) was apparently lower than the mean score of post-tests in control group 9.7 (32.33%), suggesting that the music therapy was effective in labour pain reduction ($P<0.05$). Findings of the study revealed that music therapy would be very helpful in reducing labour pain perception in primigravida mothers during first stage of labour (Kumarilohar, *et al.*, 2018) [4].

Conclusion

To conclude, music therapy is effective to reduce pain during the first stage of labour among primi parturient mothers. 30 primi parturient mothers who underwent music therapy are compared with a control group who received routine care. The present study findings revealed that music therapy is effective in the reduction of pain during the first stage of labour. Since it is cost-effective, feasible intervention without any side effects, it can implement as non-pharmacological therapy to all the mothers who are admitted to the labour room.

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