International Journal of Medical and Health Research
ISSN: 2454-9142
Received: 02-05-2020; Accepted: 18-05-2020; Published: 03-06-2020
www.medicalsciencejournal.com
Volume 6; Issue 6; 2020; Page No. 05-09

Evaluating the effect of music therapy on the establishment of lactogenesis and maternal breastfeeding satisfaction levels

Bhuvaneswari Ramesh[1], Sumathy Sundar[2*], Seetesh Ghose[3], Gunasekaran D[4], Sivaprakash B[5], G Ezhumalai[6]

[1] Center for Music Therapy Education and Research, Sri Balaji Vidyapeeth (Deemed to be University), Pondicherry, India
[2] Centre for Music Therapy, Education and Research (CMTER), Sri Balaji Vidyapeeth (Deemed to be University), Pondicherry, India
[3] Department of Obstetrics and Gynaecology, Mahatma Gandhi Medical College and Research Institute, Sri Balaji Vidyapeeth (Deemed to be University), Pondicherry, India
[4] Department of Paediatrics, Mahatma Gandhi Medical College and Research Institute, Sri Balaji Vidyapeeth (Deemed to be University), Pondicherry, India
[5] Department of Psychiatry, MGMCRI, Sri Balaji Vidyapeeth (Deemed to be University), Pondicherry, India
[6] Senior Statistician and Research consultant, Sri Balaji Vidyapeeth (Deemed to be University), Pondicherry, India

Abstract
Background: Establishment of lactogenesis is an important determinant for a successful breastfeeding journey of first-time mothers. Breastfeeding is essential for provision of immunity and neurodevelopment. Primigravids commonly encounter issues with the initiation of lactation process. Music has been documented to have an impact on reducing anxiety, stress as well as pain perception during labour thereby benefiting lactating mothers. This current study had evaluated the effect of music therapy aiding on process of lactogenesis and breastfeeding in primigravids
Objectives: To evaluate the effect of active music listening and singing lullabies on the establishment of lactogenesis and maternal breastfeeding satisfaction in new mothers.
Methods: This is an exploratory randomized controlled trial with primigravids (n=62) randomized and allocated into two groups i.e. (music therapy/group A; n=33) and (control group/ group B; n=29) respectively. Music therapy intervention was provided to group A, while standard medical care was commonly given to both groups. The UNICEF breast feeding checklist and Maternal Breast-Feeding Evaluation Scale (MBFES) was used to evaluate initiation of lactation time and maternal breastfeeding satisfaction levels respectively.
Results: There was statistically significant improvement in the initiation of lactation time, time of each feed and maternal breastfeeding satisfaction levels with a steady rise in time of each feed in music therapy group. There was also a significant difference in increase in time of feeds between the music therapy and control groups.
Conclusion: Music therapy may be helpful as an effective coping strategy for first-time mothers and help them in establishing lactogenesis. Music therapy may also be helpful in enhancing the maternal breast-feeding satisfaction levels.

Keywords: anxiety, breastfeeding, Indian music, lactation, lactogenesis, maternal satisfaction, music therapy

1. Introduction

United Nations Children's Fund (UNICEF) defines the breast milk as the baby's "first immunization' and highly beneficial to child's overall heath. It is an established fact that breastfeeding for the first six months and slowly adding safe nutritive diet provides the child with necessary health [1]. Establishing lactogenesis can be delayed due to reasons like maternal or fetal stress associated with the breastfeeding for the first time and the infant's suckling ability [2, 3]. Literature has clearly listed on some modifiable factors that influence early lactation process inclusive of duration of labor, medication during labor, delivery mode, caesarean birth, overweight mothers stressful labor and delivery, emergency and psychosocial stress or pain due to childbirth which are documented risks for early initiation of lactation [4, 5].

Prolonged labor and stress can often lead to an emergency caesarean which may impact the child's ability to suckle and may result in incessant crying and irritability.[6] Prolonged labor influences oxygen levels of the baby, transient cardiac arrhythmias and amniotic fluid contamination which causes distress and affects baby's growth [7].

Music therapy has been recorded in various studies for its relaxing properties and its effects on pain perception, anxiety, stress in different stages of labor [8]. Also, music has been observed to calm down mothers after delivery [9]. Music prior to breastfeeding had been shown to reduce anxiety of mothers and also increase the milk volume and the suckling of the newborn [9].

However, no studies have been cited that have used music therapy to record the maternal satisfaction with breastfeeding, onset of lactation time and the effects of music on long term basis for the improvement of breast-feeding practices, which are primary objectives to be evaluated in our study.

2. Materials and methods

2.1 Study Design

We employed a randomized controlled trial design (RCT) and conducted this study in a tertiary care teaching hospital

in South India. The institutional human ethics committee approval was obtained (Reference no: PG dissertation/ 2017/02/65).

2.2 Subjects
A total of 115 primigravid mothers, who were admitted for delivery at the Department of Obstetrics and Gynecology in the tertiary care hospital for the study period of 6 months, were considered to take part in the study.

2.3 Inclusion and Exclusion Criteria
The inclusion criteria were (i) age between 19 years & 35 years (ii) a gestation period above 37 weeks (iii) who were visiting the same tertiary care hospital and accepted to participate in the study by giving informed consent.
Exclusion criteria were :all pregnant women who did not possess an electronic device in which their preferred music could be uploaded, those with hearing problems, having any pre-diagnosed medical illness including psychiatry disorders, unwilling/ uncooperative/ not consented for participation in the study.

2.4 Recruitment of subjects
Of the 115 pregnant women who were screened for the study, 81 women underwent normal delivery. 34 were ruled out due to complications like gestational hypertension/ diabetes. The obtained samples were randomly assigned by a computer assisted method in which random numbers were generated in the system and accordingly the participants were distributed in to two groups. Music therapy intervention group (n=42) and control group (n=39). Standard care needed for both groups was provided. The sample considered for final analysis was reduced by 9 and 10 mothers respectively in the intervention and control groups as they were lost in follow ups. The final sample of 62 i.e. music therapy (group A; n=33) and control (group B; n=29) was considered for statistical analysis. The methodology is shown in the flow chart (Flowchart 1)

2.5 Intervention
A qualified music therapist administered the music therapy intervention in this study. Preferred music from the therapist prepared playlist consisting of Indian classical flute music with the relaxation properties of soft timbre and slow tempo was played by individual MP3 players to all the primigravids recruited for the study in the labor room for half an hour duration over headphones in the morning and evening for three consecutive days in the postnatal ward. After discharge from the hospital, mothers allocated to the music therapy group were asked to listen to preferred music while at home from the play list prepared by the therapist consisting of Indian classical flute music for 15 minutes and were encouraged to sing the lullabies from the play list in regional language for 15 minutes (total of 30 minutes) twice every day in the morning and evening until the 45th day when they came for immunization.

2.6 Assessment
UNICEF Breast-feeding checklist (UBFC) was used to record the perception of breastfeeding and ability to breastfeed by the mother (maternal perception). Maternal breastfeeding evaluating scale (MBFES) was used to evaluate and measure the satisfaction levels of mothers after childbirth with regards to breastfeeding. Checklist for music therapy intervention for home use (CMLH) was used to record information on whether the mothers were able to listen to music at home. On call reminders were arranged daily**.**
Maternal perception of initiation of lactation time was recorded at baseline and after 72hours after occurrence of lactation. Onset of lactation was assessed by using the UNICEF Breast observational check list which was recorded every day after birth of child until the 4thday. Maternal Satisfaction on breastfeeding was assessed by maternal breastfeeding satisfaction evaluation scale (MBFES) on the 4th day and after 45 days following delivery. A checklist was used by the therapist to analyze and/or to note the confounding factors influencing the music interventions while the mothers were at home. The women were assessed on the music listening and lullaby singing patterns if they were able to listen to music/sing lullabies on a regular basis until the 45th day when they came for immunization.

3. Results & Discussion
SPSS version 19.0 (IBM SPSS, US) software was used for all testing. Descriptive analyses were reported as percentage, mean and standard deviation of continuous variables. Inferential analysis was reported with chi-square, independent-t tests. Mean, standard deviation and independent t test were used to measure the quantitative data for onset of lactation time and MBFES scores. Chi square and percentage were used to analyze qualitative data for UNICEF Breastfeeding checklist.

4. Results
The common age group of women were between 21-25 years (48.5%) followed by 26-30 years (33.3%). The education status was mostly higher secondary (45%) and maximum women belonged to a nuclear family background (78%). Majority of the women had spontaneous labour (63%). The homogeneity of the two groups was tested based on age of the participants, educational level and type of labour. The results show that the differences were not significant. Hence the two groups were comparable. (Table 1). The mean number of days for establishment of lactogenesis in music therapy group was 3±1 and for control group it was 4.14±1.16. Mothers in music therapy group had established lactogenesis earlier compared to control group and it was significant (p=0.001) (Table 2). The number of feeds on day 2 was assessed which indicated that 67 % in music group had below 8 feeds and 31% in control group had below 8 feeds and the differences was significant (p=0.005) (Table 3) The comparison of time taken for each feed on day 2 between music therapy group and control group was highly significant ($p < 0.0005$) (Table 4). The maternal satisfaction in breast feeding significantly increased with the ($p < 0.0005$) in the music therapy group. There was also a significant increase in the maternal enjoyment and role attainment, the infant satisfaction and growth subscales ($p<0.005$) (Table 5).

5. Discussion
Stress, anxiety and longer labor affects the establishment of lactogenesis [10, 11]. Non pharmacological interventions such as music have been found to be useful in reducing the pain and improving coping abilities for women in labor [12, 13]. Also few studies have concluded that music can reduce the

distress levels in the labor room considerably [14]. Oxytocin supported by prolactin influences maternal behavior during labour and immediately after as well. Stress during labor impacts release of oxytocin, which is necessary for delivery and the secretion of breast milk [15]. Delayed onset of milk secretion is frequently blamed with stress during labor [16] and the inadequate release of prolactin and oxytocin when stress is experienced during the labor [17]. Studies have shown that reduction of stress during labour after delivery in first time mothers may help in coping with pain and improve the process of lactogenesis [18].

Our study recorded significant difference in the establishment of lactogenesis between the two groups. The early establishment of lactogenesis in the primigravids as recorded in this study could be due to their reduced distress levels due to music therapy intervention, which helped them to cope well with the new-mother experiences. Also, our study indicated that the number of feeds and time of each feed improved notably in the1st and 2nd days with music therapy intervention.

Music has the ability to capture and hold attention/distract as well as engage emotionally [19]. Perceived control over experiences of pain and distress relates to the belief that one is able to respond in a particular way which subsequently decreases the effectiveness of an event [20]. Music in a way can be related to this perceived sense of control at any time to distract from pain and relieves anxiety, promoting a sense of belief in the controllability of pain [21]. In this study, the primigravids used their preferred music from the long playlist of instrumental relaxing music provided by the therapist. Preferred music is associated with contexts one is reminded of while listening, which is one's personal memories and meanings connected with the music.[22] These feelings of personal preferences in music have been associated to the reduced perception of pain and anxiety and use of analgesics [23].

Music brings about conscious positive emotions which increases the prolactin in breastfeeding mothers and prolactin is an essential hormone needed for milk secretion [24]. Researches have documented increase in milk production with music intervention in mother's who had premature babies [25]. Another study [26] recorded an increase in time of feeds with the use of music with the premature babies. This study recorded a steady increase in the time taken for each feed in the music therapy group when compared to the control group in full term babies.

There was significant difference in the time taken for the establishment of lactogenesis between the two groups. Establishment of lactation was measured in number of days and the breastfeeding checklist was used as a way to measure the time taken for establishment of lactogenesis based on maternal perception of breastfeeding practice and baby's behavior towards breastfeeding [27]. The breastfeeding checklist also similarly recorded significant difference in increase in feeding time of the infant, ability to feed and a greater satisfaction from the mother.

The breastfeeding satisfaction levels showed no difference between the two groups except for subscale 1 of maternal satisfaction and role attainment. However, there was significant improvement in breastfeeding satisfaction levels within the music therapy group with the pre and post test scores.

Maternal confidence and efficacy with breastfeeding is essential for comfortable breastfeeding practices as well as the mother's motivation to continue breastfeeding for a longer duration [28]. Maternal satisfaction and efficacy is essential for long term breastfeeding for the infant who ensures better health for the infant in terms of safety from infections as well as for normal growth development.

The present study has used a maternal satisfaction evaluation scale to test the long-term effects of music therapy on breastfeeding and recorded improvement in maternal satisfaction in breastfeeding with music therapy. However, intergroup comparisons did not show any difference in the MBFES Scale scores measuring the breast-feeding satisfaction.

6. Tables and Figures

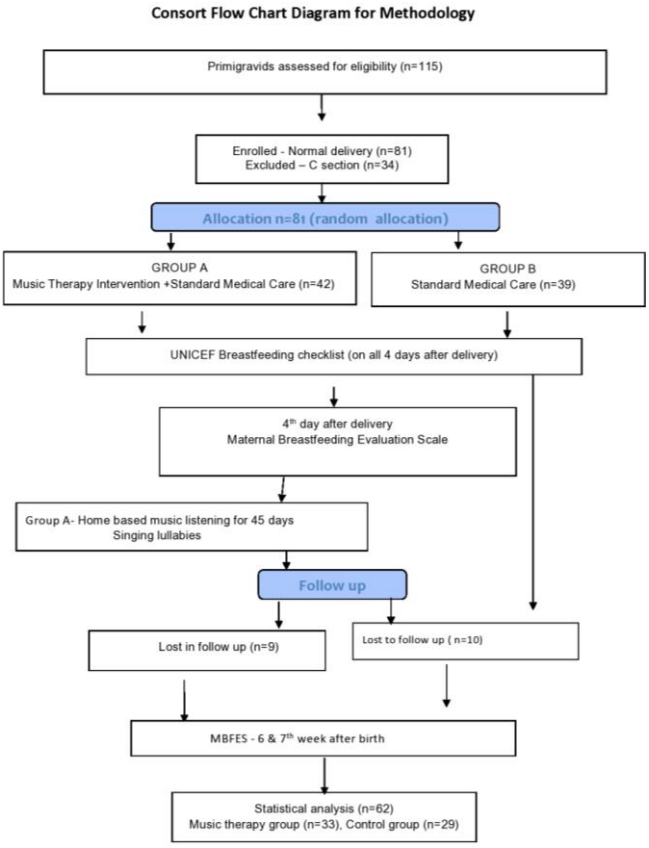

Table 1: Socio-demographic details

Demographic details	Music therapy group	Control group
Age (In Years)		
>20 years	6(18.2%)	9(31.0%)
21-25 years	16(48.5%)	13(44.8%)
26<	11(33.3%)	7(24.1%)
Total	33(100%)	29(100%)
Education (Literacy Rates)		
Higher Secondary	15(45.5%)	6(20.7%)
Diploma	1(3.0%)	0(0%)
Graduation	16(48.5%)	21(72.4%)
Post – graduation	1(3.0%)	2(6.9%)
Total	33(100%)	29(100%)
Type Of Labour		
Spontaneous labor	21(63.6%)	16(55.2%)
Induced labor	12(36.4%)	13(44.8%)
Total	33(100%)	29(100%)
Family Type/Settings		
Nuclear family	26 (78.8%)	16(55.3%)
Joint family	7(21.2%)	13(46.7%)
Total	33(100%)	29(100%)

Table 2: Days to establish lactogenesis between the Music therapy and Control groups

Initiation of lactation (days)	N	Mean (in days)	SD	Sig(2-tailed)
Music group	33	3.00	1.000	**.001**
Control group	29	4.14	1.156	

Table 3: Comparison of number of feeds on day 2 between the music therapy group and control group

Group		Number of Feeds day2			Chi value	P value
		Below 8 feeds	Above 8 feeds	Total		
Music	Count	22	11	33		
	% within group	66.7%	33.3%	100.0 %	7.8	0.005
Control	Count	9	20	29		
	% within group	31.0%	69.0%	100.0 %		
Total	Count	31	31	62		
	% within group	50.0%	50.0%	100.0 %		

Table 4: Comparison of duration for each feed on day 2 between music therapy group and control group

Time in minutes for each feed day 2		Group			P value
		Music	Control	Total	
5mins	Count	5	4	9	0.0005
	% within	55.6%	44.4%	100.0%	
10min s	Count	5	20	25	
	% within	20.0%	80.0%	100.0%	
15min s	Count	15	4	19	
	% within	78.9%	21.1%	100.0%	
20min s	Count	7	1	8	
	% within T_min3	87.5%	12.5%	100.0%	
Total	Count	33	29	62	
	% within T_min3	53.2%	46.8%	100.0%	

Table 5: Paired t-test – MBFES and subscales within the music therapy group

Name	N	Mean	SD	Sig(2tailed)
MBFES*	33	-7.516	7.149	0.0005
Subscale 1**	33	-5.065	5.008	0.0005
Subscale 2***	33	2.484	2.715	0.0005
Subscale 3****	33	.32	2.942	0.931

*MBFES – maternal breast feeding evaluation scale;** Subscale 1- maternal enjoyment and role attainment scale; *Subscale 2- Infant satisfaction and growth scale;****Subscale 3 – Maternal lifestyle and body image

8. Conclusions

Music therapy in the form of listening to relaxation music and singing lullabies to the new born may be helpful as an effective coping strategy for stress and anxiety in case of first time lactating mothers. Music can also help achieve early onset of lactation and aid in enhancing the maternal breast feeding satisfaction levels. Further studies with larger samples can provide a better insight on this subject.

9. References

1. Dodt R, Ximenes L, Almeida P, Batista Oriá M, Dennis C. Psychometric and maternal socio demographic assessment of the breastfeeding self-efficacy scale - short form in a Brazilian sample. Journal of Nursing Education and Practice. 2012; 2:1-8.
2. Hurst N. Recognizing and Treating Delayed or Failed Lactogenesis II. Journal of Midwifery & Women's Health. 2007; 52:588-94.
3. Dewey KG. Maternal and fetal stress are associated with impaired lactogenesis in humans. The Journal of nutrition. 2001; 131:3012S-5S.
4. Dewey KG, Nommsen-Rivers LA, Heinig MJ, Cohen RJ. Risk factors for suboptimal infant breastfeeding behavior, delayed onset of lactation, and excess neonatal weight loss. Pediatrics. 2003; 112:607-19.
5. Awi DD, Alikor EA. Barriers to timely initiation of breastfeeding among mothers of healthy full-term babies who deliver at the University of Port Harcourt Teaching Hospital. Nigerian journal of clinical practice. 2006; 9:57-64.
6. Neville MC, Morton J, Umemura S. Lactogenesis: the transition from pregnancy to lactation. Pediatric Clinics of North America. 2001; 48:35-52.
7. Mezzacappa ES. Breastfeeding and maternal stress response and health. Nutrition reviews. 2004; 62:261-8.
8. Lovelady CA. Is maternal obesity a cause of poor lactation performance? Nutrition reviews. 2005; 63:352-5
9. Chapman DJ, Perez-Escamilla R. Does delayed perception of the onset of lactation shorten breastfeeding duration? Journal of Human Lactation. 1999; 15:107-11.
10. Zhu P, Hao J, Jiang X, Huang K, Tao F. New insight into onset of lactation: mediating the negative effect of multiple perinatal biopsychosocial stress on breastfeeding duration. Breastfeeding Medicine. 2013; 8:151-8.
11. Escott D, Spiby H, Slade P, Fraser RB. The range of

coping strategies women use to manage pain and anxiety prior to and during first experience of labour. Midwifery. 2004; 20:144-56.
12. Tabarro CS, Campos LB, Galli NO, Novo NF, Pereira VM. Effect of the music in labor and newborn. Revista da Escola de Enfermagem da USP. 2010; 44:445-52.
13. Mohd Shukri NH, Wells JCK, Fewtrell M. The effectiveness of interventions using relaxation therapy to improve breastfeeding outcomes: A systematic review. *Matern Child Nutr*. 2018; 14:e12563.
14. Kıyıcı JM, Koçyİgİt R, Tüzemen N. The effect of classical music on milk production, milk components and milking characteristics of Holstein Friesian. Journal of Tekirdag Agricultural Faculty. 2013; 10:74-81.
15. Halldorsdottir S, Karlsdottir S. Journeying through labour and delivery: perceptions of women who have given birth. Midwifery. 1996; 12:48-61.
16. Mitchell LA, MacDonald RA. An experimental investigation of the effects of preferred and relaxing music listening on pain perception. Journal of Music Therapy. 2006; 43:295-316.
17. Phumdoung S, Good M. Music reduces sensation and distress of labor pain. Pain Manag Nurs. 2003; 4:54-61.
18. Colliver AA. The Effect of Music Listening on Relaxation Level and Volume of Breast Milk Pumped by Mothers of Infants in the Neonatal Intensive Care Unit. 2015.
19. Juslin P, Sloboda J. Music and emotion. Oxford: Oxford University Press, 2005.
20. Hansen G, Streltzer J. The Psychology of Pain. Emergency Medicine Clinics of North America. 2005; 23:339-348.
21. Beck SL. The therapeutic use of music for cancer related pain. Oncol Nurs Forum. 1991; 18:1327-37.
22. Brown C, Chen A, Dworkin S. Music in the Control of Human Pain. Music Therapy. 1989; 8:47-60.
23. Kittithanesuan Y, Chiarakul S, Poovorawan Y. Effect of Music on Immediately Postpartum Lactation by Term Mothers after Giving Birth: A Randomized Controlled Trial. Journal of the medical association of Thailand. 2017; 100:834.
24. Phumdoung S, Good M. Music reduces sensation and distress of labor pain. Pain Manag Nurs. 2003; 4:54-61.
25. Dimitraki M, Tsikouras P, Manav B, Gioka T, Koutlaki N, Zervoudis S *et al*. Evaluation of the effect of natural and emotional stress of labor on lactation and breast-feeding. Arch Gynecol Obstet. 2016; 293:317.
26. Shukri MNH, Wells JCK, Fewtrell M. The effectiveness of interventions using relaxation therapy to improve breastfeeding outcomes: A systematic review. Matern Child Nutr. 2018; 14:e12563.
27. Huron D. Why is sad music pleasurable? A possible role for prolactin. Musicae Scientiae. 2011; 15:146-58.
28. Weiss J, Bassett V, Cragg B. Developing a prenatal breastfeeding workshop to support maternal breastfeeding self- efficacy. J Obstet Gynecol Neonatal Nurs. 2006; 35(3):349-57.