

Original Article

Receptive Music Therapy: An Effective Means to Enhance Well-Being in Patients Undergoing Cesarean Section and Hysterectomy and their Operating Team

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ABSTRACT

Background: Cesarean section and hysterectomy are important life-changing gynecologic surgeries which can potentially influence physical and psychological well-being. There is a need to address the psychological aspects of care through nonpharmacological measures. Multilevel and multidimensional effects of music therapy have been shown to have potential benefits in many clinical conditions in this regard. **Objectives:** The aim of this study was to explore the effects of receptive music therapy on perioperative anxiety and hemodynamic profile in patients undergoing hysterectomy and cesarean section and to analyze perceptions and experiences of surgical team involved in their care. **Materials and Methods:** A total of 141 patients undergoing elective cesarean section/hysterectomy were enrolled. Physiological and psychological parameters such as pulse, respiratory rate, blood pressure, pain, fatigue, overall psychological well-being measured peri-operatively were compared between intervention group ($n = 65$) and control group ($n = 76$). Subjective well-being was assessed using the Visual Analog Scale for perioperative anxiety, postoperative fatigue was assessed using a 5-grade Linear Analog Scale, overall well-being was assessed using a 5-grade Linear Analog Scale. Experiences and perceptions of health-care team operating upon these patients about deliverance and effects of receptive music were recorded with the help of semi-quantitative questionnaire. **Results:** There was a statistically significant reduction in perioperative anxiety in patients receiving music therapy ($P < 0.05$). No difference in hemodynamic parameters was observed between intervention and control groups ($P > 0.05$). Health-care professionals reported positive influence of listening to music during the surgery in form of reduction of their stress and increase in comfort. **Conclusion:** Receptive music therapy reduces perioperative anxiety in patients undergoing hysterectomy and cesarean section and has de-stressing and refreshing effects on operating team.

KEYWORDS: Cesarean section, hysterectomy, psychological well-being, receptive music therapy

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INTRODUCTION

“The role of music lies in helping the consciousness uplifts itself toward the spiritual heights.”^[1] Music therapy is one of the expressive therapies, consisting of a process wherein music therapist uses music to

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create an effect on all planes of one's being—physical, emotional, mental, social, esthetic, and spiritual—to help the patients attain health at all levels of being. Described as an alternative medicine and allied health profession, its growth as therapeutic science is a well-researched phenomenon of a fact known since times immemorial. Number of studies have documented its positive effects in various clinical conditions, yet there is a dearth of studies of its effect during gynecological operations.^[2] Although psychological care is important in both these surgeries, it often takes a back seat due to priority of physical care over the one's emotional, spiritual, and psychological needs.

Therefore, we set out to offer composed music as adjunct therapeutic intervention to these patients and analyze its effects on well-being during their perioperative moments of pain, stress, and anguish. Our core aspiration was to provide an opportunity to connect patients with their inner being and receive the “harmonizing, healing, and ameliorating touch, that music has potential to give” and document its effects and also record reflections of health-care professionals involved in the treatment.

MATERIALS AND METHODS

1. **Conceptualization:** The research project was conceptualized by authors 1 and 8 with active help and guidance of authors 2 and 6 during the formers' visit to Sri Aurobindo Ashram in 2016. Authors 1 and 7 are gynecologist and physician, respectively, author 2 is a composer-educator who works with therapists and medical practitioners in health-care settings to compose music that can heal and author 6 is a complementary health therapist. It was decided to go for Receptive Music Therapy since it was not feasible for the music composer and therapist to be present at the pre, intra, and postoperative stages in operation theater/labor room at the concerned hospital
2. **Composition:** There were two separate recorded music compositions for each type of surgery. Each composition was about 12 min' duration. The process of composing music involved creating original music for therapy after discussing, analyzing, and understanding the potential range of psychophysical uniqueness, hospital settings and healing processes and relating them to relevant composition of musical and sonic elements. Discussion was also focused on understanding the psychological state of the patients for the two diverse conditions including cultural and musical preferences, the care giving team's psychological condition while operating, the sound environment of the operation theater, labor room, and recovery room, and the likely duration of the music intervention in pre, intra, and postoperative stages. The music used for therapeutic intervention was a piece of instrumental music based on Raag Darbari, Hamsadhvani, Kafi
3. The musical and sonic elements of the composed therapeutic music were Ragas (melodic modes from Indian Classical music system), Talas (rhythm patterns from Indian Classical music system), motifs, Laya (tempo), sound design including nature sounds that give the patient and care-giving team a sonic experience of being in nature, frequency, range, and amplitude. A special care was taken to maintain the amplitude at a medium level, ensure that the musical instruments don't go to very high frequencies and keep the timber of the overall music – pleasant to the ear. Every composed piece had two phases. For the composition for cesarean section, Phase I consisted of sonic elements of Nature from India, which was geographically and culturally relevant to the subject. Sonic elements were those that do not trigger fight-flight conditions, soothing to the ear and generating a sense of security and happiness-outdoors, i.e. in open air in communion with Mother Nature. Phase II: Along with the above, Raga Darbari rendition by the sitar, an instrument known widely in Indian classical music tradition, used in both Indian Classical and spiritually uplifting devotional songs as accompaniment. This Raga typically denotes joy. The “Rasa”— a kind of esthetic experience which has more important and significant contribution for creating the “esthetic” experience in the listening individual was “*Vir Rasa*.” For the composition for hysterectomy, Phase I comprised of repetitive motifs based on Raga Hansadhvani with ability to lead toward entrainment rendered by the piano. It is a lively Raga literally meaning “cry of the swan.” *Vilambit* laya with silence in between to bring down the pulse of the patient which may have a higher than normal pulse due to anxiety, silence allows the patient to breathe (inhale-exhale). Phase II comprised of Raga Kafi, also rendered by the piano. This fundamental Raga is often associated with Shringar Rasa, which can be translated in a psychological context as Empathy. The tempo is *Madhya Laya* to give a feeling of urgency toward wellness and well-being.
4. **Setting and intervention:** Study was carried out in the operation theater complex of Shree Krishna Hospital, a tertiary care medical college hospital in Central rural Gujarat. Selection of patients: Patients scheduled for elective surgery under spinal anesthesia

were randomly divided into intervention and control groups after taking their informed consent. The exclusion criteria were as follows: Cognitive or psychiatric disorders, hearing-impairing diseases, chronic treatment with analgesics, and presence of serious comorbidities. Intervention: Those in intervention group ($n = 65$) received dosages of music therapy (through ear phones/speakers as per patient's choice) for 15 min in preoperatively and at least 30 min intra and 15 min postoperatively. The control group consisted of patients who were being operated under similar setting for similar indications ($n = 76$) and received conventional care.

5. Parameters studied: In addition to sociodemographic parameters and clinical details, the following parameters were recorded
 1. Hemodynamic parameters: Pulse, blood pressure, respiratory rate, and SpO₂ (pre, intra, and postoperative states)
 2. Pain intensity by the Visual Analog Scale (VAS)^[3]
 3. Perioperative anxiety by VAS scale^[4]
 4. Postoperative fatigue by a 5-grade Linear Analog Scale
5. Overall well-being by a 5-grade Linear Analog Scale
6. Experiential feedback given by some of the patients
7. The experiences and perceptions of health-care team operating upon these patients while the music therapy was being offered were recorded with help of semi-quantitative questionnaire. Questionnaires for postoperative fatigue and well-being and caregiver experiences were designed and validated by the investigator team.

The work commenced in 2017 after obtaining permission from the Institutional Ethics Committee.

Descriptive statistics (mean [standard deviation], frequency [%]) were used to present the profile of study participants. Paired sample *t*-test was used to assess the change (if any) in the characteristics of interest before and after the surgery in both groups. Independent sample *t*-test on the difference was employed to assess whether the magnitude of the difference is significantly different across groups. The analysis was performed using STATA (14.2, Stata Corp LLC, College Station, TX, USA). $P < 0.05$ was considered statistically significant.

RESULTS

1. Demographic characteristics, surgical interventions, and physiologic parameters of intervention and control groups for each type of surgery are shown in Tables 1 and 2. There was no statistically significant difference between the two groups. Mean age:

Table 1: Basic demographic and clinical details

Demographic/clinical details	Intervention	Control
Number of patients	65	76
Mean age	37.12 (12.92)	33.92 (8.50)
Type of anaesthesia: SA	65	74
Type of anaesthesia: GA	00	02
Duration of surgery (h)	1.2672414	1.3839286
Type of surgery: Hysterectomy	20	35
Type of surgery: LSCS	45	41

LSCS: Lower segment cesarian section, SA: Spinal anaesthesia, GA: General anaesthesia

- Intervention group: 37.12 ± 12.92 Control group: 33.92 ± 8.50 Average gestational age: Intervention group: 38.3 weeks \pm 4 days Control group: 38.2 weeks \pm 3 days. Average duration of surgery: Intervention group: 1.26 ± 0.39 h Control group: 1.38 ± 0.50 h
2. Pre- and postoperative anxiety: Comparison between pre- and postoperative anxiety in intervention and control groups is shown in Table 3 (lower value indicates lesser difference before and after intervention for the parameter studied). There was statistically significant improvement in subjective well-being characterized by deep relaxation, relief from anxiety, distraction from worries was well-written on the faces of patients
 3. Pre- and postoperative fatigue: There was a reduction in post-pre fatigue and increase in well-being after 1 and 24 h post-pre following surgery, but it was not statistically significant [Table 4]
 4. Health-care professionals' observations and experiences: Health-care professionals' observations, cognitive, and emotional experiences about the effect of music therapy on their own work, comfort, and their perceptions about patients' physical and emotional well-being using a 10-item questionnaire on a Likert like scale was recorded ($n = 31$). All health-care professionals responded to the questionnaire. From among them, 12 were obstetricians and gynecologists, 10 anesthetists and 9 were nursing staff [Table 5].

DISCUSSION

Historically, music is even older than language; healing sounds have always been considered as an important aid in the medical practice. In recent times, growing need to provide integral care for pain, anxiety, and psychological well-being in perioperative periods has led researchers to scientifically study the effects of music therapy. Studies have reported that exposure to music does produce certain neuro-endocrinal and psychoneuroimmunological changes in the body which can contribute to its healing

Table 2: Hemodynamic parameters

Parameter	Mean±SD	
	Intervention	Control
Pulse rate: Baseline (per min)	90.20±11.806	89.42±8.356
Pulse rate: Peroperative (per min)	88.90±13.112	91.11±13.450
Pulse rate: Postoperative: 1 h (per min)	85.53±8.253	88.11±9.322
Pulse rate: Postoperative: 24 h (per min)	83.79±5.678	84.87±6.795
SBP: Baseline (mm Hg)	121.90±11.525	120.47±9.988
SBP: Peroperative (mm Hg)	120.82±10.945	118.68±9.634
SBP: Postoperative: 1 h (mm Hg)	118.69±11.033	116.05±9.329
SBP: Postoperative: 24 h (mm Hg)	120.34±10.987	113.18±19.590
DBP: Baseline (mm Hg)	78.6±7.184	78.68±6.646
DBP: Peroperative (mm Hg)	76.74±7.263	76.84±5.745
DBP: Postoperative: 1 h (mm Hg)	76.57±6.949	74.74±6.035
DBP: Postoperative: 24 h (mm Hg)	76.59±6.764	74.74±5.569

SBP: Systolic blood pressure, DBP: Diastolic blood pressure

Table 3: Preoperative and postoperative anxiety in intervention and control groups

Anxiety questions	Intervention	Control	P
Waiting for the operation	4.7813±2.66350	2.5526±1.32945	<0.001
Being at the mercy of medical staff	4.5625±2.53781	1.9474±1.65949	<0.001
Results of the operation	4.5625±2.53781	1.9474±1.65949	<0.001
Postoperative pain	3.7500±2.87849	1.8947±1.39089	<0.001
Discomfort after waking up after the operation	4.2031±2.70907	1.9474±1.52364	<0.001
Postoperative nausea and vomiting	3.8594±2.44863	2.5526±1.46486	0.001
Not knowing what is happening	4.1406±2.84447	2.2368±1.56713	<0.001
Physical and/or mental harm after the operation	3.5781±2.88843	3.1053±1.91424	0.323
Not awakening from anaesthesia	3.5938±3.36518	2.5789±1.50012	0.039
Awareness during anaesthesia	4.1250±3.43881	2.8947±1.81271	0.020

Table 4: Status of fatigue and wellbeing

Parameter	Intervention	Control	P
Postoperative-fatigue-1 h	2.87±1.024	3.61±0.946	0.313
Postoperative-fatigue-24 h	2.38±0.974	2.87±0.875	
WB-1	3.25±0.936	3.03±1.026	0.657
WB-24	3.88±0.781	3.58±0.889	

WB: Well being

effect.”^[5] The qualitative and quantitative research literature base of music incorporates varied domains such as clinical therapy, psychotherapy, bio-musicology, musical acoustics, music theory, psycho-acoustics, and embodied music cognition, esthetics of music, sensory integration, and comparative musicology.

Hysterectomy and cesarean section are two major yet entirely different life-changing events for women; each has its own peculiar psychological vulnerability, stress and anxiety. Removal of uterus *per se* can threaten women’s self-worth and thereby carry emotional sequels, including depression, anxiety, and guilt.^[6] In a pregnant woman, the very thought of the approaching birth and changes associated with it can create stress and cause discomfort.^[7] Cesarean section is an anxiety-ridden surgical operation which usually causes considerable feto-maternal discomfort.^[8,9]

Receptive music therapy is one of the three types (receptive, active, and participative therapies) wherein one merely “receives a prescribed music piece to listen to.” Details of aspects incorporated in music composition have been described in the section of methodology. Briefly, receptive music therapy aimed at to invoking the *Primordial Sound* which has harmonizing influences in health and disease.

Acceptance and results of music therapy is influenced by multitudinous factors such as cultural beliefs and preferences, cognitive level, and awareness about music, personal aptitudes, emotional requirements/susceptibilities, type of music, and musical instruments used. A few studies have demonstrated user selected music to be more advantageous, but equal data suggest that researcher-selected music is most effective in reducing anxiety, primarily because it incorporates evidence-based parameters such as consistent tempo and dynamics, stable rhythms, and smooth melodic lines.^[10] It has been shown that nurses’ knowledge or awareness about music as a therapeutic tool is significantly associated with behavioral intention.^[11] Evidence also suggests that music therapists can serve as experts to help medical personnel identify effective implementation

Table 5: Observations of operation theatre healthcare professionals

Question	Strongly disagree (%)	Disagree (%)	Can't say (%)	Agree (%)	Strongly agree (%)
Do you think music distracts you in your work in OT?	58.06	25.80	9.6	6.4	0
Do you think music reduces anxiety of patients before anaesthesia?	0	1.6	16.12	25.8	48.38
Do you think music reduces your vigilance in OT?	12.09	16.12	12.9	19.35	6.45
Do you think music reduces pain and discomfort of patients?	0	9.6	6.45	45.96	38.7
Do you think music produces a sense of familiarity in a strange environment for the patients?	3.22	3.22	19.32	41.93	32.25
Do you think music makes patient feel less fatigued?	0	9.6	6.45	54.83	29.83
Do you think music improves concentration in OT?	3.22	16.12	19.35	41.9	19.35
Do you think music restricts your communication with other staff in OT?	24	51.61	9.6	9.6	9.6
Do you think music reduces your autonomic reactivity in stressful surgeries?	3.22	16.12	16.12	48.38	16.12
Do you prefer music being played in OT?	0	0	0	54.83	45.96

OT: Operation theatre

strategies.^[12] Keeping this and in mind, the musician member of the study group composed two different kinds of music and offered the same to respective groups.

Our results indicate that as compared to the control group, the experimental group had significantly lower level of anxiety and a higher level of satisfaction in both the surgical interventions perioperatively. Patients also reported a reduced sense of insecurity and suspense at the commencement of operation, increased confidence, reduced discomfort after waking up from the operation, reduced postoperative pain, nausea, and vomiting. We failed to observe the beneficial effects of music therapy on hemodynamic parameters. Studies have shown either no effect or positive effect of music therapy on hemodynamic variables which is in conformity with a majority of studies on the subject. Ebnesahidi and Mohseni have reported that although music therapy reduced early postoperative pain and analgesic requirements, it did not influence anxiety and hemodynamic profile.^[13] This probably calls for the exploration of effects of music along paradigms which are different than biophysical. A Cochrane analysis investigating the effect of music during cesarean section identified one randomized study that was able to show a positive effect of music intervention on heart rate.^[14]

Health-care professionals (operating surgeons, anesthetists, and nurses) reported increase in enthusiasm, reduced fatigue, and stress of surgery as an effect of listening to music played during the surgery. They observed that it was helpful in focussing on surgical work and improved efficiency while making working in operation theater more comfortable and enjoyable. One consultant mentioned that the music played during surgery had long lasting soothing and quietening effects which persisted for hours after the surgery. They too felt that playing music peri-operatively reduced anxiety

and fatigue of patients through cultivation of a sense of comfort and familiarity in otherwise alien environment of operation theater. More than 69% health-care professionals observed that playing music during surgery did not distract them from their own work and in fact had calming effect on them by reducing autonomic reactions during stressful moments during surgery. Similar findings have been reported by George *et al.* who observed that majority of the respondents preferred playing music in the operation theater which helped them relax because it improved their cognitive function, created a sense of well-being elevated mood in them. It also helped in reducing the autonomic reactivity of theater personnel in stressful surgeries.^[15]

Elaborating upon detailed mechanisms of effects of music therapy is beyond the scope of the present paper. Briefly, effects of music can be described on the basis of its cognitive, emotional, and physiological effects through hormonal secretions and nociceptive reflexes.^[16] In the parlance of integral health, the so-called “alternative” healing methods try to evoke and stimulate – *through tools such as music* – the body’s own healing powers with remarkable results.^[17] The happiness derived by the experience of a rasa through music and poetry is not materialistic. It is transcendental inner happiness, which takes away the pain and miseries. Karuna *et al.* have provided a very scholastic description of Indian Ragas and rasās (a particular aesthetic emotional archetype), which could help to heal particular disease through release of negative thought pattern. Their elaborate review provides an insight into specific healing properties of various ragas on various diseases and emotional disturbances, for example, Asavari that which emanates Veer rasa which is helpful to counter anxiety.^[18]

Positive effects of music therapy on cognitive and physical parameters such as concentration and endurance,

and psychological parameters such as joy and relaxation, besides that of reducing stress, pain, and anxiety are well-known *truth-perceptions*. This perspective reflects a much profounder *truth* of basis of music therapy and its influence on deeper levels of one's consciousness which exceed biophysical paradigm of life and health. Music is one of the methods of inner opening and one of the most powerful.^[19] Music deepens the emotions and harmonizes them with each other.^[20] A composition of music, which is psychic in origin (and not vital/emotional, which may be the case most of the times) has the capacity to take oneself away from the outer consciousness deep down within oneself to the psychic plane which is the source of all experiential peace, joy, bliss, and tranquillity. It facilitates perfect expression of harmony and insensibly steepens the man in it.^[21] We believe that a especially composed music with an aspirational intent has a capacity of helping the listener in shifting focus of one's awareness away from the disturbing and uncomfortable milieu exterior to one's inner state of quietude through rising of consciousness of the listener. This shift in one's consciousness tends to lead to a higher probability of building a sense well-being and wellness. Incorporating music in mainstay of therapeutics would foster return to a newer concept of health based on the harmonies, which play fundamental role in balancing one's milieu exterior under the influence of one's milieu interior.

There are several unique features of our study. Effects of music therapy have never been studied simultaneously (in a formally published single study) for two divergent groups of very common obstetric/gynecologic operations. Effects of passively listening to the offered music on health-care professionals too have seldom been studied simultaneously. Our study opens up possibilities of future study in several areas: One possible extension of the study would be to offer the same music to the mother and the new born baby during their follow-up visits and record responses of mother and child, since the mother would be in a much better psychological frame to articulate her experience. Anecdotal reports suggest that the *in utero* fetus or new born baby do respond to environmental stimuli such as music to which it has been exposed priori. There are several limitations in the present study: Many confounding factors can influence the outcome, such as the gravidity of woman, gender of the new born child, indication of hysterectomy, one's educational status and liking, or, "openness" to music, etc., which have not been studied.

CONCLUSION

To conclude, the present study documents that in patients undergoing hysterectomy and caesarean

section, a especially composed receptive music therapy acts as a powerful nonpharmacologic tool to enhance psychological well-being. It also helps in creating an environment that stimulates and maintains relaxation, well-being, and comfort in the midst of prolonged, stressful working hours. Implementation in clinical routine therefore seems advisable. It can only be recommended that there is a need to create a "culture of care" founded on integral understanding of human beings for including multimodal interventions in care.

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Conflicts of interest

There are no conflicts of interest.

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