

Original Research Article

Estimation of the effects of music therapy on the anxiety and patient's perception during an upper gastrointestinal endoscopy procedure: a randomised controlled trial

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ABSTRACT

Background: An upper gastrointestinal (GI) endoscopy procedure is an invasive medical procedure that is used in diagnosis and treatment of various intestinal disorders. Patients posted for upper GI endoscopy procedures often experience significant levels of pre-procedural fear, anxiety and discomfort during the procedure which can negatively affect cooperation levels during the procedure with the attending doctor. A very few studies have explored the beneficial effects of music therapy in this regard and so our study was planned.

Methods: A prospective randomised controlled trial was conducted with a sample of 54 patients who were enrolled for this study. They were randomly divided into two groups - group 1 consisting of 27 patients, receiving a music therapy intervention and group 2 consisting of 27 patients who served as a control group. Group 1 received a receptive music therapy intervention in the form vocal, relaxing, improvisational music with patient preferred chants for fifteen minutes before and during the endoscopy procedure. Group 2 did not receive a music therapy intervention.

Results: The results indicated that the post intervention, state-anxiety levels was significantly lower in the music therapy group compared to the control group with ($p=0.001$). Patients' cooperation levels during the procedure with the attending doctor was significantly higher in the music therapy group than in the control group ($p=0.001$).

Conclusions: Repeated music therapy intervention is highly beneficial in reducing state anxiety levels and improving cooperation levels during the GI endoscopy procedure.

Keywords: Anxiety, Endoscopy, Music therapy, Patient cooperation, Upper gastrointestinal surgery

INTRODUCTION

A hospital environment, from a patient's point of view, is commonly associated with feelings of worry and concern. This is due to, them being scheduled for various diagnostic or therapeutic medical procedures. The prospect of an invasive procedure can provoke feelings of

uncertainty, discomfort, physical and emotional pain, fear and anxiety. Procedure related anxiety can lead to increased pain perception and poor pain management during the post-operative period. Additionally, increased anxiolytic medication can have increased side effects and medical costs.¹ Listening to relaxing music has shown to have anxiolytic properties and positive effects on the

human stress response.¹⁻³ Music can serve as an alternate focus of attention during difficult invasive procedures and can provide comfort and familiarity in a medical environment.¹ As a result, musical interventions in a medical setting is relevant and is constantly gaining importance in the form of music medicine and music therapy.^{4,5} When pre-recorded music is administered by a medical professional for the patient to listen to, it is termed music medicine.^{4,5} Music medicine is passive listening to pre-recorded music administered by medical personnel. Whereas, music therapy adopts multifaceted and diverse approaches. Music therapy is practiced by a qualified music therapist and is a process where, a therapeutic relationship is developed between the patient and the therapist and music is more presented as an experience and not just as a stimulus. Music Therapists connect to the cultural profile of the patient in designing the music therapy interventions which includes ascertaining the musical profile/background of the patients.⁴ Music therapy attempts to present a musical experience to the patient whereas a music medicine approach employs passive listening to music.⁵ An upper gastrointestinal (GI) endoscopy is an invasive medical procedure used for diagnosis and treatment of various intestinal disorders.⁶ This procedure involves examining the esophagus, the stomach and the duodenum, by inserting a flexible tube (endoscope), through the mouth of the patient.^{7,8} Analogous to other invasive and minimally invasive medical procedures, a majority of the patients posted for an upper GI endoscopy report high levels of pre-procedural distress and anxiety.⁶⁻⁹ Patients with high levels of pre-procedural anxiety, as compared to patients with low anxiety levels prior to this procedure, perceive the procedure to be furthermore discomforting and painful, leading to poor cooperation levels during the procedure.^{10,11} Patient cooperation with the doctor is essential during an upper GI endoscopy to avoid complications and for a trouble-free completion of the procedure.^{12,13}

There have been a number of studies that have highlighted the effect of music on significantly reducing pre-procedural anxiety in patients posted for an upper GI endoscopy.^{11,14-17} Moreover, music has been shown to reduce discomfort during upper gastrointestinal endoscopy and colonoscopy procedures and as a result leading the patients to perceive the procedure to be not very difficult.¹⁷⁻¹⁹ However, these studies have all used pre-recorded music listening and only a few of them involve a music intervention during the procedure. The current study is conducted by a trained music therapist and using a receptive music therapy experience in the form of vocal, relaxing, raga improvisational music administered before and during an upper GI endoscopy procedure.

METHODS

The study was conducted over the span of four months (November 2018 to March 2019) at the endoscopy unit,

part of the Department of Surgery of a tertiary care hospital based in South India. The study consisted of two groups: group 1 (MT group) receiving a music therapy intervention and group 2 (control group) receiving no music therapy intervention.

A sample of 54 subjects fulfilling the inclusion criteria were chosen after getting an informed consent. They were randomly assigned to the control or music group. The inclusion criteria were- out-patients posted for an upper GI endoscopy procedure, those between the age group 21-70 and who had given informed consent for the study. The exclusion criteria were- patients with a hearing problem, who did not understand the local language, those with any known psychiatric disorders and who were unwilling for the study.

Ethics committee clearance ref no. 03/2018/139 was obtained from the hospital to conduct the study. The patients allocated to the MT group were given a music therapy intervention, in the form of live vocal, relaxing, raga improvisational music with patient preferred chants, for 15 minutes prior to the procedure in a separate quiet room.

The patients in the control group were asked to sit in silence for 15 minutes prior to the procedure in the same room. Only the patient and the therapist were present in the room during the intervention. Following the pre-procedural music therapy intervention, the patients in the MT group were given the same musical experience during the entire procedure as well. Patients were asked to try and keep their attention on the music during the procedure. Music therapy intervention was administered by a qualified music therapist

Data collection

State-anxiety levels were measured using a rating scale with measures 0 (not at all anxious), 1 (little anxious), 2 (moderately anxious) and 3 (very anxious) was used to measure state-anxiety levels. NAS was used from 0 (not at all cooperative) to 10 (extremely cooperative) was used to measure cooperation levels of the patients during the procedure with attending doctor. A quantitative proforma to measure patients' perception of overall difficulties faced during the procedure was developed after a survey that was conducted amongst the patient population in the hospital. It measured patient difficulties during the procedure. This proforma was used to measure discomfort, distress, pain, fear of the diagnosis and tolerability levels of the patients.

Music therapy intervention

Live, Raga improvisational vocal music, with patient preferred chants was administered in a slow tempo, using the signature raga phrases of morning ragas in accordance to the time theory of ragas.²⁰⁻²² Patients were given a list of chants to choose from. State anxiety levels of both

groups were recorded before and after the pre-procedural intervention using a single item Likert scale with measures from 0 to 3 where 0 was 'not at all anxious' 1 was 'little anxious', 2 was 'moderately anxious' and '3' was 'very anxious'. A quantitative proforma to assess perception of overall difficulties faced during the procedure was administered to both the groups after the procedure.

Cooperation levels of the patients were recorded by the attending doctor using a numerical rating scale from 0 to 10 where 0 was 'not at all cooperative', 5 'moderately cooperative' and 10 was 'extremely cooperative'. Feedback (open ended, user descriptive) was obtained from the patients to record responses to the music therapy intervention and was analysed for emerging themes. Feedback was obtained to be used as a way to support the intervention outcome that was generated out of this randomized clinical trial.

Statistical analysis

The scores of the Numerical rating scale (patient cooperation levels), state anxiety levels and patient's perception of overall difficulties were compared by Mann-Whitney U test. A normality test was done on all the dependent variables to determine if the data follows a normal probability distribution (Lilliefors Significance Correction) and results indicated that the data did not have a normal distribution. Thus a non-parametric test (Mann-Whitney) was used to analyse the data. A significance was considered when $p < 0.05$ in the intergroup comparison.

RESULTS

The study subjects fell between 21-70 years of age. The music therapy group comprised of 44.4% of males and 55.6% of females. The control group comprised of 51.9% of males and 48.1% of females. Dyspepsia proved to be the most frequently occurring indication for appearing for an upper GI endoscopy procedure. 82% of patients in the

music therapy group and 85.2% of the patients in the control group were diagnosed with dyspepsia.

The pre state anxiety levels in the music therapy group (mean rank=26.93, sum of ranks=727) and the control group (mean rank=28.07) were not significantly different. ($z=0.281, p=0.778$). However, the post state-anxiety levels were significantly lower in the music therapy group (mean rank=20.06, sum of ranks=541.50) than in the control group (mean rank=34.94,) ($z=3.782, p=0.001$) (Table 2).

The difference in anxiety scores, between the pre state-anxiety and the post state anxiety, was significantly greater in the music therapy group (mean rank=35.43) than in the control group (mean ranks=19.57, The anxiety difference between the two groups was significantly different. ($z=3.991, p=0.001$).

The patients' cooperation level during the procedure with the attending doctor was significantly higher in the music therapy group (mean rank=34.89), than in the control group (mean rank=20.11).

Table 1: Distribution of age and diagnosis of patients.

Demographic details	Music therapy group	Control group
Age (in years)		
All	27 (100 %)	27 (100%)
21-30	3 (11.1%)	9 (33.3%)
31-40	5 (18.5%)	4 (14.8%)
41-50	9 (33.3%)	7 (25.9%)
51-60	8 (29.6%)	5 (18.5%)
61-70	2 (7.4%)	2 (7.4%)
Diagnosis		
Dyspepsia	22 (81.5%)	23 (85.2%)
Abdomen pain	2 (7.4%)	1 (3.7%)
GB mass	1 (3.7%)	0 (0%)
S/P Omental patch closure	1 (3.7%)	0 (0%)

Table 2: Mann-Whitney U Test for pre state-anxiety and post state-anxiety between the groups.

Ranks	Group	N	Mean rank	Sum of ranks	Mann Whitney U value	Z value	p value
Pre music therapy intervention- anxiety	Music therapy	27	26.93	727.00	349	0.281	0.778
	Control	27	28.07	758.00			
	Total	54					
Post music therapy intervention- anxiety	Music therapy	27	20.06	541.50	163.5	3.782	0.001
	Control	27	34.94	943.50			
	Total	54					
Difference between pre and post anxiety scores	Music therapy	27	35.43	956.50	150.5	3.991	0.001
	Control	27	19.57	528.50			
	Total	54					

Table 3: Mann-Whitney U test for patient cooperation levels during the procedure with the attending doctor between the groups.

Ranks					Mann Whitney U	Z value	p value
	Group	N	Mean rank	Sum of ranks	value		
Patients' cooperation levels with the attending doctor	MT	27	34.89	942.00	165	3.499	0.001
	C	27	20.11	543.00			
	Total	54					

Table 4: Mann-Whitney U test for patients' perception of overall difficulties faced during the procedure between the groups.

Ranks					Mann Whitney U	Z value	p value
	Group	N	Mean Rank	Sum of Ranks	U value		
Q 1-Did you find the procedure to be discomforting?	Music therapy	27	23.74	641.00	263	1.893	0.058
	Control	27	31.26	844.00			
	Total	54					
Q 2-Did you find the procedure to be distressing?	Music therapy	27	24.11	651.00	273	1.660	0.097
	Control	27	30.89	834.00			
	Total	54					
Q 3-Are you afraid of the outcome/diagnosis of the procedure?	Music therapy	27	24.26	655.00	277	1.699	0.089
	Control	27	30.74	830.00			
	Total	54					
Q 4-Did you feel any pain during the procedure?	Music therapy	27	26.93	727.00	349	0.301	0.763
	Control	27	28.07	758.00			
	Total	54					
Q 5-How would you rate your tolerability levels of undergoing the procedure?	Music therapy	27	22.17	598.50	220.5	2.607	0.009
	Control	27	32.83	886.50			
	Total	54					
Patients' Perception of overall difficulties faced during the procedure	Music therapy	27	22.65	611.50	233.5	2.281	0.023
	Control	27	32.35	873.50			
	Total	54					

The patients' cooperation levels during the procedure with the attending doctor was significantly different between the two groups ($z=3.499$, $p=0.001$) (Table 3).

The perception of overall difficulties faced during the procedure between the two groups was assessed by five questions. The perception on procedure discomfort, distress, fear and pain were not significant between the group whereas the tolerability level and perception of overall difficulties were significant (Table 4).

DISCUSSION

The results of the current study indicate that music therapy intervention in the form of vocal, relaxing, raga improvisational music with patient preferred chants helped to reduce state-anxiety in patients, prior to the procedure. This was in consonance with the results of many studies assessing the effect of music listening

intervention on the state-anxiety levels of patients prior to their endoscopy procedure.¹⁵⁻¹⁹ Patients reported that the pre-procedural music therapy intervention (vocal, relaxing, raga improvisational music with preferred chants) helped them feel relaxed and more positive about facing the procedure. Patients reported that listening to devotional chants helped them gain confidence to face the procedure.

The relaxation response to relaxation music can be explained through the process of entrainment. Entrainment is the synchronization of body rhythms to an external rhythm.¹⁷ The music rendered was of slow tempo. Since anxiety is associated with an increase in blood pressure, heart rate and pulse rate, the music acted as an external pacemaker to regularize these physiological variables.¹⁷

Results of the study also showed that patients' cooperation levels during the procedure with the attending doctor were significantly higher in the music therapy group than in the control group. This was in consonance with another study that measured patients cooperation levels during an upper GI endoscopy procedure with and without music therapy interventions.¹⁷

The tolerability levels in the music therapy group were found to be significantly better than in the control group. This indicates that the patients in the music therapy group found the procedure to be not very difficult. This correlates with the patients' perception of overall difficulties faced during the procedure being lesser in the music therapy group.

Higher levels of patient cooperation during the procedure with the attending doctor can be attributed to the fact that the patients perceived the procedure to be less distressing. The music during the procedure managed to distract the patients from the procedure related difficulties.

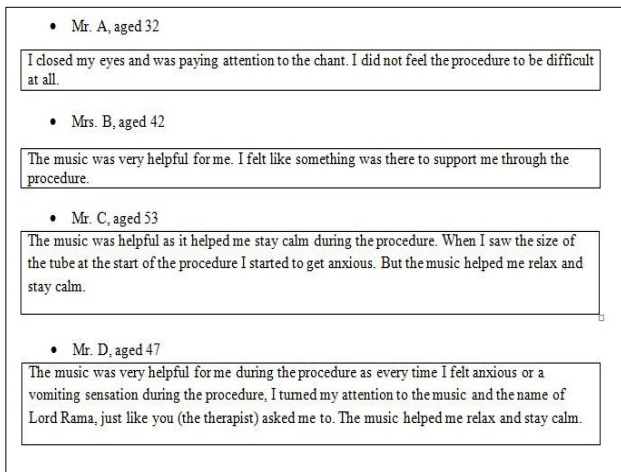


Figure 1: Feedback from patients after completing the procedure: section A.

A chant is a sacred text or a sacred word. Chanting is a form of prayer in the sense that chanting and prayer go hand-in-hand, as most chants in most religions use the name of God while chanting.^{15,23} Prayer is an effective means of coping with difficult circumstances, particularly anxiety and stress inducing situations like intimidating medical procedures.²⁴ It can be hypothesized that the chanting could have been an active coping mechanism serving as the primary focus of attention for the patients during the procedure, distracting them from the difficulties associated with the procedure.¹⁵ Additionally, positive outcomes of this study can also be attributed to the therapeutic interactions that the therapist had prior to the procedure and the therapeutic relationship that developed between the therapist and the patient during the process of this invasive procedure. These were simple words of hope conveyed after the pre-procedural musical

experience which was kept the same for all patients. Moreover, the patients were asked to actively try and keep their attention on the music during the procedure. This approach is in line with MAE (Music alternate engagement) as elaborated by Claire. M. Ghetti in her article 'Music therapy for procedural support during invasive medical procedures: towards the development of music therapy theory.'¹

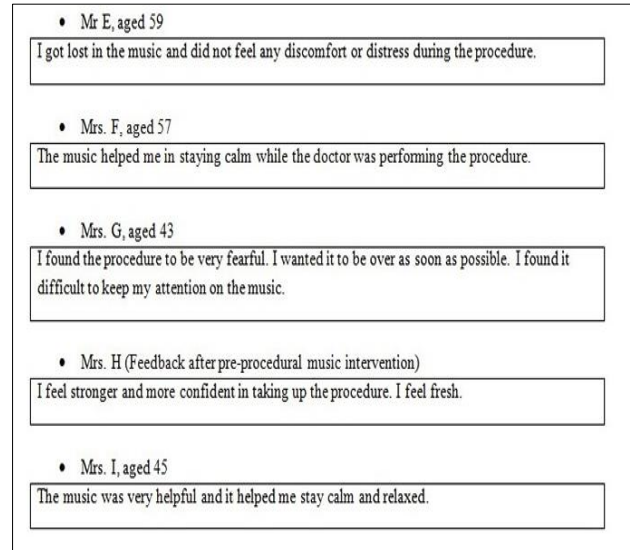


Figure 2: Feedback from patients after completing the procedure: section B.

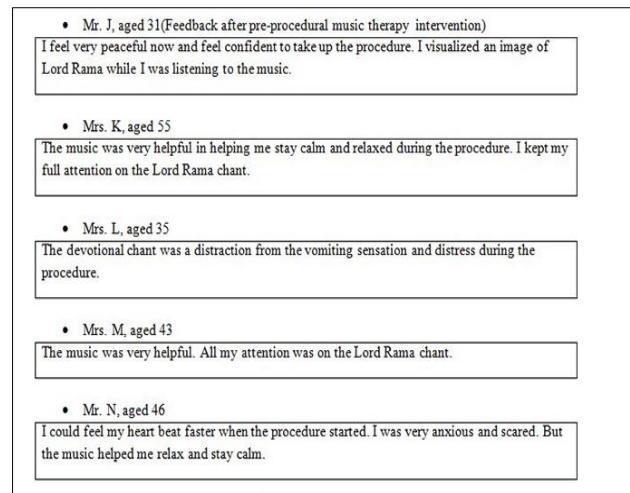


Figure 3: Feedback from patients after completing the procedure: section C.

There have been studies indicating that patients find upper GI endoscopy procedures to be anxiety invoking, discomforting, distressing and burdensome.²⁵ Furthermore, studies have shown patients to cooperate poorly during endoscopy procedures.¹³ This study indicates that a music therapy intervention can be used to address patient related difficulties associated with upper GI endoscopy procedures. A music therapy intervention can improve patient cooperation levels during the

procedure with the attending gastroenterologist. Some Common themes that emerged from the analysis of the feedback reports were 1) relaxation 2) calmness 3) distraction and 4) strength. Figure 1-3 shows narratives used by participants under music therapy.

The strength of the study lies in usage of live music therapy interventions by a qualified music therapist, evaluation of tolerability and recording of patient's narratives. The limitation of this study is the small sample size.

CONCLUSION

Music therapy intervention using ragas and chants may be beneficial in reducing state anxiety levels and improving cooperation levels during the upper GI endoscopy procedure. More studies with a larger sample size using ragas and chants are needed to draw more specific conclusions.

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Conflict of interest: None declared

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