Effect of Indian Classical Music Therapy on Depression, Anxiety and Stress Levels in Patients with Depression Measured by DASS-21: A Pilot Study

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ABSTRACT

Background and Objectives: Depression is a common global psychiatric disorder. The use of pharmacotherapy in the treatment of depressive symptoms has some disadvantages, such as side effects, long response time, and poor compliance to the medication regime. Various complementary interventions have been sought to reduce depressive symptoms and music listening can be one of it.[1] Therefore, this study is done to evaluate the effects of Indian classical music therapy on depression, anxiety, and stress levels in patients with Depression.

Method: Depression, Anxiety and Stress levels was assessed by the DASS-21 item questionnaires before and after Indian classical music (Raga-bilahari) therapy in patients with depression.

Results: There was statistically significant changes in depression (p=0.016), anxiety (p=0.018) and stress (p=0.025) scores in depression patients after music therapy.

Interpretation and Conclusion: Indian classical music (Raga-bilahari) therapy is beneficial in patients with depression, showing decreased levels of depression, anxiety and stress levels.

Keywords: DASS-21, depression, Raga- bilahari

INTRODUCTION

According to the World Health Organization (WHO), depression is a common psychiatric disorder affecting about 121 million people worldwide and is characterized by persistent low mood which leads to changes in appetite, sleep pattern and overall functioning.[2] Various psychiatric conditions are treated with either psychopharmacological or psychotherapeutic approaches and have been shown to be efficacious in many but not in all patients. For example in depression, only small differences have been found between anti-depressants and active placebos.[3] Recent evidence suggests that depressed young people prefer counselling than medication and active treatment.[4] Hence, the need for additional, innovative forms of therapy for treating psychiatric conditions. Music therapy is one such innovative form of therapy.

Music therapy is defined as " a systematic process of intervention wherein the therapist helps the client to promote health, using music experiences and the relationships developing through them as dynamic forces of change." Music experiences mean musical interaction, which can be either free or improvised. It includes either active music playing by patients or active listening to music or both. Other modes include playing composed music on instruments, singing and writing songs.[5]

The healing force of music is known since ancient times. The ancient Greek philosopher, Plato (428-

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347BC), quoted "music gives wings to mind". Plato considered that music played in different modes would arouse different emotions. Traditional systems of healing in India such as Ayurveda and Yoga systems include various musical treatment approaches. The Indian system of music treatment is defined as an "individualistic, subjective and spiritual art, aiming at personal harmony with one's own being and not at symphonic elaborations. Indian music therapy in contrast to the western form, which has its theoretical background predominantly based on psychotherapy, involves expression of devotional feelings as a key factor. The most common approach used in the Indian form of music therapy is the "raga based approach." This approach is found to be stimulating, anxiolytic, increases attention and is able to target musical preference and listening pattern.[6]

Bilahari raga: Bilahari is a raga in Carnatic music. It is a janyaraga (derived scale from the 29th melakarta scale, Shankarabharanam). It is a combination of the pentatonic scale Mohanam and the Sampurna raga scale Shankarabharanam.[7] Bilahari raga is suitable for the mornings exuding positivity and happiness. It reduces anxiety, pressures, skin diseases and allergies. Bilahari is known for the bhakti rasa that it pours forth. Ragas like bilahari, kedaram and dhanyasi (Prabhat ragas) are sung after sunrise. The ragas sound pleasant when they are sung at the proper time and sure to enhance the mood.[7,8]

OBJECTIVES

1. To assess the depression, anxiety and stress levels using DASS-21 scale before and after Indian classical music therapy along with standard care for depression in the intervention group.

2. To compare the depression, anxiety and stress levels using DASS-21 scale before and after Indian classical music therapy along with standard care in the intervention group, and standard care alone in the control group.

3. To examine whether, the Indian classical music therapy helps reduce symptoms of depression in patients with depression.

MATERIAL AND METHOD

Ethical clearance for the study protocol was obtained from the Institutional Ethical Committee (IEC NO: SIMS&RC/IECC/06/2012). Sample size was calculated from previous literature and 20 participants were enrolled, after taking written informed consent.

This pilot study is a randomized controlled trial with a pre-intervention–post-intervention design consisting of intervention group (n = 10) and a control group (n=10) using simple random sampling method.

Participants were recruited from Sapthagiri Medical College and Research Centre, Bangalore, Psychiatric OPD. Participants were adults (18–50 years of age) with a primary diagnosis of depression according to ICD-10 (F32 or F33) as assessed by Psychiatrist. Musical skills or any given musical background are not required, although these do not prevent from participation. Patients with psychosis, substance abuse, adjustment disorders, and other psychiatric disorders were excluded from the study. The study involved noninvasive procedures with no financial burden on the subjects.

Participants received adequate information regarding aim, benefits, and risks of the study before data collection. Participants in the intervention group listened to Indian classical music (Raga-bilahari) between 10am to 1pm, twice a week, each session lasting 60 minutes over a period of 2 months along with standard care. Thus, the intervention group received a total of 16 sessions of music therapy. The intervention tools included a laptop and a headphone of Hewlett Packard company. Raga-bilahari was recorded in the instrumental form and in vocal form, after obtaining 2 music experts' opinion.

The control group received only the standard care without music therapy. The standard care includes pharmacotherapy with psychiatric counselling.

The degree of patient's depression, anxiety and stress levels were measured using of 21-item Depression Anxiety and Stress Scale (DASS) at baseline i.e before treatment and after 1 month and 2 months of treatment, in the intervention group (Indian classical music therapy along with standard care) and in the control group (standard care alone).

The DASS is a 42-item self-administered questionnaire developed by Lovibond, S.H. and Lovibond, P.F.[9] This scale was designed to measure the magnitude of three negative emotional states: depression, anxiety, and stress. The **DASS- Depression** focuses on self reports of low mood, motivation and self-esteem, **DASS–Anxiety** on physiological arousal,

perceived panic, and fear, DASS–**Stress** on tension and irritability. A respondent indicates on a 4-point scale the extent to which each of the 42 statements in the DASS-21 scale applied over the past week. A printed overlay is used to obtain total scores for each subscale. Higher scores on each subscale indicates increasing severity of depression, anxiety, and stress. Completion takes 10 to 20 minutes. A shorter, 21 item version of the DASS (DASS-21) which takes 5 to 10 minutes to complete is also available. Subscale scores from the shorter questionnaire are converted to the DASS normative data by multiplying the total scores by 2.[10]

The essential function of the DASS is not only to assess the severity of the core symptom of Depression, Anxiety and Stress but a means of which a patient's response to treatment is also measured. DASS provides a comparison of symptoms from week to week, it is best given in first presentation and again after a period of time has lapsed long enough for the chosen treatment to have effect. DASS should be interpreted along side the clinical interview.[11]

In the statistical analysis, mean and standard deviation were used to describe data. Independent t-test, chi-square test of significance and ANOVA were used to analyze and compare the means. $P<0.05$ was considered the level of significance. Data were analysed by SPSS version (version-18.0) and R environment ver.R.3.2.2. software.

RESULTS

Demographic characteristics: As shown in table 1: In the present study, there was no statistically significant difference in demographic characteristics - age, gender, residence (rural/urban) and education level among participants of two groups (intervention group and control group). The participants of the two groups were demographically matched and comparable.

Table 1: Demographic characteristics of two groups

		Intervention group (n=10) No.(%)	Control group (n=10) No.(%)	P value
Age in years	21-30	2(20%)	4(40%)	0.355[a]
	31-40	5(50%)	5(50%)	
	41-50	2(20%)	1(10%)	
	>50	1(10%)	0(0%)	
	Mean±SD	37.70±8.33	34.20±8.16	
Gender	Female	4(40%)	5(50%)	1.000[b]
	Male	6(60%)	5(50%)	
Residence	Rural	1(10%)	2(20%)	1.000[b]
	Urban	9(90%)	8(80%)	
Education	Upto 10th std	5(50%)	4(40%)	1.000[b]
	Above 10th std	5(50%)	6(60%)	

[a]student t-test   [b]chi-square test

Depression score: As shown in Table 2: The baseline (pre-treatment) Depression score of the intervention group was lower than the baseline Depression score of the control group, but statistically not significant (p>0.05). After 1 month of treatment, the Depression score was lower in the intervention group than in control group but statistically not significant (p>0.05). However, depression score was lower in the intervention group compared to control group after 2 months of treatment and was statistically significant(p=0.016).

Anxiety score: As shown in Table 2: The baseline (pre-treatment) Anxiety score of the intervention group was higher than the baseline Anxiety score of the control group, but statistically not significant. (p>0.05). After 1 month of treatment, the Anxiety score was lower in the intervention group than in the control group but statistically not significant (p>0.05). However, the Anxiety score was lower in the intervention group, compared to control group , after 2 months of treatment and statistically significant(p=0.018)

Stress score: As shown in Table 2: The baseline (pre-treatment) Stress score of the intervention group was lower than the baseline Stress score of the control group, but statistically not significant. (p>0.05). After 1 month of treatment, the Stress score was lower in the intervention group than in the control group and was statistically significant (p=0.032). However, stress score was more significantly lower in the intervention group, compared to control group after 2 months of treatment(p=0.025).

Table 2: Changes in Depression, Anxiety and Stress score (Mean±SD) from baseline to 1 and 2 month.

		Intervention group (n=10) Mean ± SD	Control group (n=10) Mean ± SD	P value
Depression scores	Baseline	28.40±13.69	31.40±9.34	0.574
	After 1 month of treatment	14.80±10.80	20.60±8.90	0.206
	After 2 month treatment	3.80±3.05	8.60±4.81	0.016*
Anxiety scores	Baseline	17.00±9.15	14.80±10.92	0.631
	After 1 month of treatment	4.40±4.40	9.00±6.06	0.068
	After 2 month treatment	0.80±1.03	3.60±3.24	0.018*
Stress scores	Baseline	28.80±9.81	34.00±6.99	0.189
	After 1 month of treatment	10.80±8.23	19.80±9.02	0.032*
	After 2 month treatment	1.80±1.75	5.40±4.33	0.025*

*Significant unpaired t-test (p<0.05)

As shown in table 3: A significant (p<0.05) mean change was observed in depression, anxiety and stress scores in both intervention group and control group from baseline to 1 and 2 month and from 1 to 2 month, however, mean change was lower in intervention group than control group.

Table 3 : Mean changes in Depression, Anxiety and Stress score (Mean±SD).

	Difference	Intervention group (n=10) Mean ± SD	Control group (n=10) Mean ± SD
Depression	Baseline to 1 month (P value)	13.60±7.98 (< 0.001**)	10.80±3.29 (< 0.001**)
	Baseline to 2 month (P value)	24.60±11.70 (< 0.001**)	22.80±6.12 (< 0.001**)
	1 month to 2 month (P value)	11.00±7.92 (0.002**)	12.00±4.86 (,<0.001**)
Anxiety	Baseline to 1 month (P value)	12.60±5.66 (< 0.001**)	5.80 ±5.20 (0.006**)
	Baseline to 2 month (P value)	16.20±8.61 (< 0.001**)	11.20±8.33 (0.002**)
	1 month to 2 month (P value)	3.60±3.74 (0.014*)	5.40±3.52 (0.001**)
Stress	Baseline to 1 month (P value)	18.00±7.24 (< 0.001**)	14.20±4.26 (< 0.001**)
	Baseline to 2 month (P value)	27.00±8.75 (< 0.001**)	28.60±6.18 (< 0.001**)
	1 month to 2 month (P value)	9.00±6.68 (0.002**)	14.40±6.45 (< 0.001**)

*2×3 Repeated measures ANOVA (p<0.05)

In the present study, the primary outcome was improvement in the symptoms of depression, anxiety and stress levels in the intervention group (music therapy along with standard care) compared to control group (standard care alone) as measured by DASS-21.

DISCUSSION

Human nervous system processes music in different ways – perceptual processing and emotional processing.[6]

Perceptual processing: Music is primarily made of sound waves and enters the primary acoustic circuit through the outer ear. Human primary acoustic circuit involves auditory nerve, brainstem, medial geniculate body of the thalamus and the auditory cortex. In the inner ear- cochlea, the transduction of music into neural signal takes place and cochlea filters these signals and the outputs are tonotopically ordered.[12] These neural signals from cochlea are processed by the auditory brain

stem and sends them to thalamus, which then projects into the auditory cortex. The primary auditory cortex, secondary auditory cortex, the posterior and the anterior auditory fields are also involved in processing of music. These areas carry out perceptual analysis in terms of rhythm (timing of musical sound), pitch, intensity and roughness.[13,14]

Emotional processing: Cingulate gyrus, medial orbitofrontal cortex and amygdala are found to have auditory projections and there is evidence to suggest that music activates these regions. These regions are also involved in processing of emotional behaviors.[13,15] Research on different neuronal responses to pleasant and unpleasant music shows that, the brain activity for pleasant music is predominantly present in frontal lobes and for unpleasant music in temporal lobes.[16]

Neurochemistry: In subjects listening to pleasant music, dopamine is released from the ventral striatum and in the ventral tegmental area and thus postulated to be involved in the enjoyment of music.[13,17] Listening to music releases endorphins and nitrous oxide which produces physical effects such as local warming of the skin, reduction in blood pressure and vasodilatation and thus involved in emotional perception of music. [13] A study has found that listening to techno-music is accompanied by a significant increase in plasma norepinephrine, β-endorphin, adrenocorticotropic hormone, cortisol and growth hormone. However, while listening to classical music, no significant changes were detected in hormonal concentrations.[18]

In the present study, the music therapy with Indian classical music (Raga-bilahari) showed significant changes in the intervention group. The depression, anxiety and stress scores were decreased and was statistically significant. Our results are consistent with Deshmukh et al[19] who reported that depression scores improved with Indian classical music therapy intervention group compared to the control group and these effects persisted beyond the treatment period. Our results are also consistent with Gupta and gupta,[20] who found a significant decrease in the score on depression, state and trait anxiety in study participants who used Indian music compared to pre-test measurements.

CONCLUSION

In our study, Indian classical music therapy along with standard care showed a statistically significant beneficial changes in patients with depression showing improvement in levels of depression, anxiety and stress. Therefore, it is recommended to implement music therapy, as an adjunct in the management of depression. This technique is non-invasive, inexpensive, simple, and safe.

Limitations of the study: Further studies are required to examine the effect of music therapy over a longer time period, a larger sample size, and different forms of raga's in Indian classical music.

Conflicts of Interest: There are no conflicts of interest

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