

# Effect Of Music Therapy On Depression, Anxiety And Stress Levels In Patients With Depression

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## Abstract

**Introduction:** The outcome of any treatment or therapy is significantly impacted by the patient's psychological behaviour.

Our study aims to assess the depression, anxiety and stress levels using DASS-21 scale before and after music therapy along with standard care for depression in the intervention group.

**Material and Methods:** This is a quasi-experimental study with pre-intervention–post-intervention design consisting of intervention group (n = 30) and a control group (n=30) using simple random sampling method. Participants were adults (18–50 years of age) with a primary diagnosis of depression according to ICD-10. Patients with psychosis, substance abuse, adjustment disorders, and other psychiatric disorders were excluded from the study. The study involved non-invasive procedures with no financial burden on the subjects.

**Results:** After two months of therapy, the depression score, anxiety score and stress score were significantly lower in the intervention group as compared to the control group and this difference was statistically significant ( $p < 0.05$ ) respectively.

**Conclusion:** According to the findings of our research, patients diagnosed with depression who also received regular medical care experienced statistically significant favourable changes, including an improvement in their levels of depression, anxiety, and stress.

**Keywords:** Anxiety, depression, patients, music therapy

## INTRODUCTION

The outcome of any treatment or therapy is significantly impacted by the patient's psychological behaviour.

Along with the clinical evaluation, it was suggested that the patient's psychological state should also be evaluated, and the patient should also be counselled regarding appropriate management regimens.

This not only helps to alleviate the stress, but it also makes the treatment more effective overall.

The pharmacologic treatment is successful but comes with a number of negative effects, and it is not possible to prescribe it for long-term usage.

In light of this, the current study attempted to alleviate patients' levels of stress by playing traditional music. The effect that ragas have on one's mental health is significant. It has been discovered that ragas possess a great deal of power inside the Indian culture.

It has been demonstrated that there are specific ragas influence a person on various elements. Regularly listening to ragas is a particularly beneficial practise since it has the potential to stimulate all of the chakras in the body.

It will also improve both the quality and the quantity of one's life. Raga Bhairavi is one of the more traditional ragas, and it has been shown to be quite helpful in the treatment and management of mental health issues.

## Material and Methods:

This is a quasi – experimental study which was conducted in Indian settings from 2020 to 2023.

After ethical clearance was obtained from the Institutional Ethical Committee the study was initiated.

Sample size was calculated from previous literature and 60 participants were enrolled, after taking written informed consent.

This is a quasi-experimental study with pre-intervention–post-intervention design consisting of intervention group (n = 30) and a control group (n=30) using simple random sampling method.

Participants were adults (18–50 years of age) with a primary diagnosis of depression according to ICD-10. Patients with psychosis, substance abuse, adjustment disorders, and other psychiatric disorders were excluded from the study. The study involved non-invasive procedures with no financial burden on the subjects.

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 study group (music therapy along with standard care) and in the control group (standard care alone).

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 of the survey took 10 to 20 minutes.

Subscale scores from the shorter questionnaire are converted to the DASS normative data by multiplying the total scores by 2.1.

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.

### Statistical analysis

Descriptive statistics were reported as mean (SD) for continuous variables, frequencies (percentage) for categorical variables.

Independent t test was used.

Chi square was used to find the association between categorical variables.

ANOVA was used to compare variances across the means (or average) of three groups. Repeated measure ANOVA was used to find the significant difference within the group. Data were statistically evaluated with IBM SPSS Statistics for Windows, Version 26.0., IBM Corp., Chicago, IL.

## Results

In the current study, there was no statistically significant difference in the demographic features of participants of both the groups, including age, gender, location (rural/urban), and education level. These variables include age, gender, residence (rural/urban), and education level of study group and control group.

The people who took part in each of the two groups were equivalent to one another in terms of their demographics.

Table 1. Distribution of demographic variables among the study participants (N=60)

Sl no	Variable	Study group (n=30)	Control group (n=30)	X <sup>2</sup> (df), p
1	<b>Age</b>			
	21-30	6 (20)	12 (36.7)	3.98 (3)
	31-40	15 (50)	15 (50)	0.26
	41-50	6 (20)	3 (10)	
	51-60	3 (10)	1 (3.3)	
2	<b>Gender</b>			
	Male	12 (40)	15 (50)	0.60
	Female	18 (60)	15 (50)	(1),0.43
3	<b>Residence</b>			
	Rural	3 (10)	6 (20)	1.17 (1),
	Urban	27 (90)	24 (80)	0.27
4	<b>Education</b>			
	Illiterate	3 (10)	3 (10)	
	Primary	6 (20)	5 (16.7)	5.12 (3),
	Higher secondary	9 (30)	2 (6.7) 1	0.17
	Graduates	15 (50)	20 (66.7)	

Table 2: Distribution of changes in Depression, Anxiety and Stress score (Mean SD) from baseline to 1 and 2 months.

Sl no	Variable	Time line	Study group (n=30)	Control group (n=30)	p
1	Depression Scores	Baseline	27.30±12.19	30.12±8.14	0.57
		After 1 month of treatment	13.80±9.70	19.70±7.80	0.21
		After 2 months of treatment	3.17±2.95	7.60±3.81	0.001
2	Anxiety Scores	Baseline	18.01±7.15	15.80±9.92	0.63
		After 1 month of treatment	4.20±4.10	9.08±7.06	0.07
		After 2 months of treatment	0.70±1.09	5.60±4.24	0.02

3	Stress Scores	Baseline	27.90±8.91	32.00±7.99	0.19
		After 1 month of treatment	10.60±7.23	18.50±8.02	0.03
		After 2 months of treatment	1.40±1.57	5.34±3.23	0.03

Depression score:

Although the baseline Depression score of those in the intervention group was lower than the baseline of depression score of those in the control group, the difference was not statistically significant ( $p>0.05$ ).

After one month of therapy, the Depression score was significantly lower in the intervention group than in the control group; however, this difference did not reach statistical significance ( $p>0.05$ ).

After two months of therapy, the depression score was significantly lower in the intervention group as compared to the control group and this difference was statistically significant ( $p = 0.016$ ).

Anxiety score:

Although the baseline (pre-treatment) anxiety score of the intervention group was significantly greater than the baseline (pre-treatment) anxiety score of the control group, this difference did not reach statistical significance. ( $p>0.05$ ).

After receiving treatment for one month, the intervention group had a lower Anxiety score than the control group; however, the difference was not statistically significant ( $p>0.05$ ).

However, after two months of therapy, the anxiety score was significantly lower in the intervention group as compared to the control group ( $p=0.018$ ). This difference was statistically significant.

Stress score:

The stress score at the start (before treatment) for those in the intervention group was lower than the stress score at the start for those in the control group, but the difference was not statistically significant. ( $p>0.05$ ). It was statistically significant ( $p=0.032$ ) that after one month of therapy, the Stress score was lower in the intervention group than in the control group. This change occurred in both groups.

After two months of treatment, the stress score was considerably lower in the intervention group as compared to the control group ( $p = 0.025$ ).

## Discussion

Perceptual processing and emotional processing are two distinct ways in which music is processed by the human nervous system.

Sound waves are the basic component of music, and these waves reach the primary acoustic circuit through the external auditory canal. The auditory nerve, the brainstem, the medial geniculate body of the thalamus, and the auditory cortex are all components of the basic acoustic circuit in humans.

The translation of music into brain signals takes place in the cochlea, which is located in the inner ear.

The cochlea then filters these signals, and the outputs are sorted tonotopically.<sup>7</sup>

These neural impulses originating from the cochlea are processed by the auditory brain stem, which then transmits them to the thalamus.

The thalamus subsequently projects these signals into the auditory cortex. The processing of music also involves the primary auditory cortex, the secondary auditory cortex, the posterior and the anterior auditory fields.

In these regions, perceptual analysis is carried out with regard to rhythm (the timing of musical sound), pitch, intensity, and roughness.<sup>8,9</sup>

It has been discovered that the cingulate gyrus, the medial orbitofrontal cortex, and the amygdala all have auditory projections, and there is evidence to suggest that music activates these regions of the brain. Additionally, the processing of emotional behaviours involves certain parts of the brain.<sup>8,10</sup>

The frontal lobes are where most of the brain activity is while listening to happy music, but the temporal lobes are where most of the brain activity is when listening to bad music, according to research on the differing neuronal responses to pleasant and unpleasant music.<sup>11</sup>

Dopamine is thought to be involved in the enjoyment of music since it is released from the ventral striatum and the ventral tegmental region in subjects who listen to nice music. These areas are located in the ventral part of the brain.<sup>8,12</sup>

When people listen to music, endorphins and nitrous oxide are released into the body.

These chemicals produce physical effects, such as a local warming of the skin, a fall in blood pressure, and vasodilation, and are therefore implicated in the emotional sense of music.<sup>8</sup> A rise in plasma levels of norepinephrine, beta-endorphin, adrenocorticotrophic hormone, cortisol, and growth hormone was shown to be associated with listening to techno music, according to the findings of a research study.

On the other hand, listening to classical music did not result in any discernible shifts in the concentrations of the various hormones.<sup>8</sup>

The current study found that the intervention group that received music therapy saw considerable positive change.

The ratings for despair, anxiety, and stress all went down, which was a change that was statistically significant.

Deshmukh et al<sup>14</sup> observed that depression scores improved with Indian classical music therapy intervention group compared to the control group and that these effects maintained beyond the treatment period.

Our findings are consistent with their findings.

When compared to pre-test measurements, Gupta et al<sup>15</sup> discovered that research participants who listened to Indian music saw a significant reduction in their levels of depression, state anxiety, and trait anxiety.

## Conclusion

According to the findings of our research, patients diagnosed with depression who also received regular medical care experienced statistically significant favourable changes, including an improvement in their levels of depression, anxiety, and stress. As a result of this, it is strongly suggested to include music therapy as an additional component in the treatment of depression. This method is not invasive in any way, it is not expensive, it is not complicated, and it is safe.

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