



Received 5 January, 2010; received in revised form 15 February 2010; accepted on 25 February, 2010

## ANTI-DEPRESSANT POTENTIAL OF MUSIC THERAPY

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### Keywords:

Depression,  
cognition,  
Music Therapy,  
Blood Pressure

### ABSTRACT

Depression should be recognized as a clinical syndrome that is characterised by a cluster of emotional, behavioural, and cognitive features. The prevalence of depression is consistently high worldwide, and is associated with considerable morbidity. Music is one of the oldest and most basic socio-cognitive domains of the human species. Music Therapy is growing as a profession globally, both in quantity and stature as a recognized treatment. In the light of above, we were interested to elucidate the usefulness of Music Therapy in the management of depressed patients. This research project was carried out on fifty indoor patients admitted at Gupta Hospital, Hisar. All the patients, who received Music Therapy showed fast recovery from depressive symptoms and exhibited normal behavior after 5 days of Music Therapy. Music Therapy had positive influence on the cognitive parameters and patients showed stable mind, better perception, improved expression, good intellect, fine decision making ability and sharp memory after receiving Music Therapy. Music Therapy administered for five days evoked fall in blood pressure and heart rate close to normal values in patients, who showed hypertension and tachycardia at the time of admission into the hospital. EEG was found to be normal in all the patients under study before and after Music Therapy. Furthermore, Music Therapy had positive influence on the cognition status and general behavior of patients. In conclusion, this study provides clinical evidence for the application of Music Therapy in managing patients suffering from depression. Music has the unique capability of bringing back the charm and making the life worth living for depressed patients.

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**INTRODUCTION:** Misconceptions towards mental disorders and the prevailing stigmatizing attitude among both, the general public and health professionals constitute major barriers in the recovery of mentally ill patients. Depression should be recognized as a clinical syndrome that is characterised by a cluster of emotional, behavioural, and cognitive features manifested by low mood, anhedonia and low energy levels, feeling of worthlessness, guilt, suicidal tendencies, sleep disturbances, pessimism, guilty feelings, low self-esteem, suicidal tendencies and food- intake dysregulation<sup>1</sup>. The prevalence of depression is consistently high worldwide, and is associated with considerable morbidity. Depression is a common problem affecting about 121 million people world-wide<sup>2</sup>. It occurs in persons of all genders, ages, and back- grounds. Depression also poses a significant economic burden to society as it leads to reduced productivity, treatment costs and loss of human life by suicide. The patients resort to alternative systems of medicine for depression because they;

- Entail a lack of satisfaction with allopathic medicines and/or
- They desire to avoid side effects and/or
- They are scared of the stigma attached to conventional treatment

During the past few years, music has increasingly been used as a tool for the investigation of human cognition and its underlying brain mechanisms. Music is one of the oldest and most basic socio-cognitive domains of the human species. Music Therapy is growing as a profession globally, both in quantity and stature as a

recognized treatment. Music Therapy comprises of use of music interventions to accomplish individualized goals within a therapeutic relationship by a credentialed professional. Music Therapy interventions can be designed to promote wellness, improve communication and provide unique opportunities for interaction<sup>3</sup>.

**OBJECTIVE:** In the light of above, we were interested to elucidate the usefulness of devotional music in the management of depressed patients.

**EXPERIMENTAL DESIGN:** This research project was carried out at Gupta Hospital, Hisar with the kind cooperation of psychiatrist Dr. Narender Kumar Gupta MD. Fifty indoor patients admitted at Gupta Hospital during the period from 1<sup>st</sup> September to 31<sup>st</sup> December, 2007 served as research participants. Both, male and female patients participated in this study. Medical history was recorded for each patient soon after admission into hospital. The age of patients varied from 18 years to 60 years. All the patients belonged to Haryana State in India. For administering Music Therapy, only such patients, who were diagnosed to be suffering from depression, were selected. Music Therapy was administered in two sessions lasting for 30 min each. A collection of Indian devotional songs compiled in a CD was used uniformly throughout this study. Physiological parameters such as Heart Rate (Beats/ minute), Blood Pressure (systolic/ diastolic), Body Temperature (<sup>0</sup>F ) and EEG were observed before and after Music Therapy sessions. In addition to above physiological parameters, the general mental state of patients was assessed by observing their fluency in speech, orientation (understanding of

time and place), ability to concentrate and cognitive status (perception, thought process, mood swings, general intelligence and judgment) with the help of the clinical psychologists. The performance of patients (in respect of speech, orientation, concentration, memory, cognition) was rated as - = poor, - - = defective or - - - = impaired indicating progressively the severity of the abnormality. The improvement in the mental state of patients after Music Therapy was recorded as + = average, + + = proper or + + + = excellent.

**MUSIC THERAPY SESSIONS:** There were thirty patients in control group, who did not receive Music Therapy. These patients however underwent anti-depressant treatment from the day of admission till discharge from the hospital. Twenty patients consented to participate in the research project and received Music Therapy in two sessions per day lasting for 30 min each. Morning session of Music Therapy commenced at 9 AM and evening session at 6 PM. A minimum of 10 sessions spread over 5 days were administered to these patients. However, two patients had recovered considerably from depression and exhibited normal behavior after just two days (4 Music Therapy sessions). These two patients were discharged from the hospital, hence were not available for further Music Therapy intervention. The Music Therapy sessions were administered in a sound proof environment in the presence of the psychiatrist and the clinical psychologist. All the patients received classical antidepressant treatment (Clomiperamine -10mg TDS / Nortriptyline) on the day of admission two times in a day. Some patients also received lorazepam injection

on first day to take care of their sleep complaints. However, from second day onwards sedative (lorazepam) was removed from the treatment. This experimental design was approved by the Research Ethics Board / Institutional Ethics Committee constituted as per the guideline of ICMR (Indian Council of Medical Research), New Delhi.

**RESULTS:** Music Therapy administered for five days evoked fall in blood pressure and heart rate close to normal values in patients, who showed hypertension and tachycardia at the time of admission into the hospital. There was no significant change in the body temperature of depressed patients before and after Music Therapy (Table 1) EEG was found to be normal in all the patients under study before and after Music Therapy. All the patients, who received Music Therapy showed fast recovery from depressive symptoms and exhibited normal behaviour after 5 days of Music Therapy. Devotional music had positive influence on the cognitive parameters and patients showed stable mind, better perception, improved expression, good intellect, fine decision making ability and sharp memory after receiving Music Therapy.

The cognition status of these patients was assessed by testing their perception, mood swings, general intelligence and judgment. Music Therapy had positive influence on these cognitive parameters and the patients exhibited better perception, stable mind, good intelligence and fine decision making ability. In nutshell, the speech of depressed patients was more fluent; orientation had improved from poor to proper state and these patients showed

sharp memory after Music Therapy intervention (Table- 2). Music Therapy had been effective in controlling various symptoms of depression and improved overall behaviour and mental state of the patients as reflected by their good conduct, improved co-operation with hospital staff, good expression, positive attitude and increased interest in life. Thirty patients, who did not receive Music

Therapy (control group) exhibited headache and disturbed night-sleep during hospital stay and were advised to take antidepressants even after discharge from the hospital. On the other hand, the patients who received Music Therapy experienced sound sleep at night and did not complain of headache during hospital stay.

**Table 1: Effect of Music Therapy on physiological parameters of depressed patients**

| Patients | Age (Yrs.)<br>Gender | Blood Pressure<br>( mm Hg) |          | Pulse Rate (per min.) |          | Body Temperature<br>(°F) |          |
|----------|----------------------|----------------------------|----------|-----------------------|----------|--------------------------|----------|
|          |                      | Before MT                  | After MT | Before MT             | After MT | Before MT                | After MT |
|          |                      |                            |          |                       |          |                          |          |
| 1        | 38/M                 | 110/70                     | 120/80   | 60                    | 64       | 96                       | 98.6     |
| 2        | 28/M                 | 150/110                    | 140/90   | 122                   | 90       | 98.6                     | 98       |
| 3        | 18/M                 | 140/100                    | 130/90   | 78                    | 74       | 98.9                     | 98       |
| 4        | 45/M                 | 130/90                     | 126/90   | 86                    | 80       | 98.2                     | 96.9     |
| 5        | 30/M                 | 130/90                     | 120/80   | 88                    | 76       | 98.2                     | 98.2     |
| 6        | 19/M                 | 110/70                     | 120/80   | 118                   | 82       | 98.2                     | 96.5     |
| 7        | 30/F                 | 150/110                    | 130/90   | 66                    | 86       | 96.1                     | 98.6     |
| 8        | 60/M                 | 140/90                     | 120/90   | 90                    | 80       | 97.4                     | 98       |
| 9        | 31/M                 | 130/90                     | 120/80   | 92                    | 84       | 98.3                     | 98.7     |
| 10       | 22/F                 | 100/70                     | 120/80   | 102                   | 80       | 97.4                     | 98.7     |
| 11       | 23/F                 | 110/80                     | 120/80   | 84                    | 80       | 98.3                     | 98.7     |
| 12       | 21/M                 | 130/80                     | 120/80   | 82                    | 76       | 98.6                     | 98.6     |
| 13       | 18/F                 | 130/80                     | 120/80   | 80                    | 76       | 97                       | 98.6     |
| 14       | 35/M                 | 110/70                     | 120/80   | 88                    | 72       | 98.7                     | 98.6     |
| 15       | 42/M                 | 140/90                     | 130/90   | 96                    | 72       | 98.6                     | 98.2     |
| 16       | 18/M                 | 130/80                     | 120/80   | 88                    | 85       | 98.4                     | 98.8     |
| 17       | 40/F                 | 110/70                     | 120/80   | 84                    | 72       | 98.1                     | 98.5     |
| 18       | 38/F                 | 150/100                    | 140/100  | 94                    | 76       | 98.5                     | 98       |
| 19       | 15/F                 | 130/80                     | 120/80   | 96                    | 86       | 98.2                     | 98.4     |
| 20       | 35/M                 | 110/80                     | 120/80   | 84                    | 82       | 96.6                     | 98.6     |

Blood Pressure denotes - Systolic/Diastolic values; M= Male, F= Female; Music Therapy (MT)

**TABLE 2: Effect of Music Therapy (MT) on general mental state of patients**

| Patients | Before Music Therapy |             |       |        |           | After Music Therapy |             |       |        |           |
|----------|----------------------|-------------|-------|--------|-----------|---------------------|-------------|-------|--------|-----------|
|          | Speech               | Orientation | Conc. | Memory | Cognition | Speech              | Orientation | Conc. | Memory | Cognition |
| 1.       | -                    | -           | -     | -      | --        | ++                  | +           | +     | +      | ++        |
| 2.       | -                    | -           | -     | -      | -         | +                   | +           | -     | +      | ++        |
| 3.       | -                    | -           | -     | -      | --        | +                   | +           | +     | +      | ++        |
| 4.       | --                   | -           | --    | -      | -         | ++                  | +           | +     | +      | +         |
| 5.       | --                   | -           | -     | -      | --        | ++                  | +           | +     | +      | ++        |
| 6.       | -                    | -           | -     | -      | ---       | ++                  | +           | +     | +      | +         |
| 7.       | -                    | -           | -     | -      | --        | +                   | +           | +     | +      | ++        |
| 8.       | --                   | -           | -     | -      | -         | +                   | +           | +     | +      | +         |
| 9.       | -                    | -           | -     | -      | --        | ++                  | +           | +     | +      | ++        |
| 10.      | -                    | -           | -     | -      | -         | +                   | +           | +     | +      | +         |
| 11.      | -                    | -           | --    | -      | ---       | +                   | +           | +     | +      | ++        |
| 12.      | -                    | -           | --    | -      | -         | +                   | +           | +     | +      | +         |
| 13.      | ---                  | --          | -     | --     | --        | ++                  | ++          | +     | +      | ++        |
| 14.      | -                    | -           | -     | -      | --        | +                   | +           | +     | +      | +         |
| 15.      | -                    | -           | -     | -      | --        | +                   | +           | +     | +      | +         |
| 16.      | -                    | -           | -     | -      | --        | ++                  | +           | +     | +      | +         |
| 17.      | --                   | -           | -     | -      | --        | +                   | +           | +     | +      | +         |
| 18.      | --                   | -           | -     | -      | --        | ++                  | +           | +     | +      | +         |
| 19.      | --                   | -           | -     | -      | --        | +++                 | +           | +     | +      | ++        |
| 20.      | -                    | -           | -     | -      | --        | +                   | +           | +     | +      | ++        |

Conc. = Ability to concentrate; - = Poor; -- = Defective; --- = Impaired; + = Average; ++ = Proper; +++ = Excellent

**DISCUSSION:** Listening to music is a complex process for the brain, since it triggers a sequel of cognitive and emotional components with distinct neural substrates. Recent brain imaging studies have shown that neural activity associated with music listening extends well beyond the auditory cortex involving a wide-spread network of frontal, temporal, parietal and subcortical areas related to attention, semantic memory and music syntactic processing as well as limbic and paralimbic regions related to emotional processing<sup>4</sup>.

We examined the concentration ability, speech, short-term memory and cognitive status of various patients suffering from depression at Gupta Hospital, Hisar, in this research project. At the time of admission, the self expression of patients was incoherent and distorted. The speech of these patients was fluent, orientation had considerably been improved from poor to proper state and these patients showed sharp memory after Music Therapy intervention. These results are in agreement with the studies of Schellenberg et al., (2007); Schon et al., (2004), who showed that Music Therapy significantly improved performance on the speech content and cognitive performance<sup>5,6</sup>. Furthermore, Music Therapy considerably improved mood, facial expression and verbalization in chronically ill patients<sup>7</sup>. The patients, who received Music Therapy sessions, were able to concentrate effectively as compared to the concentration ability tested before administering Music Therapy in this study. Music facilitated problem solving ability, concentration, cognitive function and stimulated long term memory recall in Alzheimer's

patients<sup>5</sup>. These reports are in conformity with our observations. Music distracts patients from unpleasant symptoms<sup>7, 8</sup>. Music Therapy administered for 5 days in the present study evoked fall in elevated blood pressure. The heart rate was restored to normal values in some patients, who showed hypertension and tachycardia at the time of admission into the hospital. These results are in agreement with the studies of Sutoo and Akiyama, (2004), which showed that Music Therapy may influence central physiological variables like blood pressure, heart rate, respiration, EEG pattern and body temperature<sup>9</sup>.

Music Therapy can be considered as a complimentary or alternative means of treatment for the benefit of depressed patients in view of high prevalence of depression. Depression costs the US economy, directly and indirectly, over 44 billion dollars per year and it seems that the incidence of major depression is increasing and that the onset of this condition occurs at a much younger age now than in previous generations<sup>1</sup>. Music Therapy is an innovative, artistic; scientific and evidence based method of restoring, maintaining and improving the emotional, physiological and psychological well-being of human beings of all ages and abilities through the power of music. Music knows no boundaries. It pervades everywhere irrespective of caste, creed, culture, national barriers or blood-brain barrier. Music is a form of sensory stimulation, which provokes responses due to the familiarity, predictability, and feelings of security associated with it<sup>10, 11</sup>. Listening to pleasant music activates an interconnected network of subcortical and cortical brain regions, which includes

the ventral striatum, nucleus accumbens (NAc), amygdala, insula, hippocampus, hypothalamus, ventral tegmental area (VTA), anterior cingulate, orbitofrontal cortex and ventral medial prefrontal cortex<sup>4</sup>. In the present study, Music Therapy had been effective in alleviating various symptoms of depression and improved overall behavior and mental state of the patients. These findings are in line with the reports in literature<sup>12</sup>. Since allopathic medicines attack selected symptoms of depression & exhibit adverse effects, complimentary therapies are becoming popular. Music Therapy aims at exerting a possible beneficial effect on social, emotional and cognitive skills and helps in reducing the behavioral problems of patients with depression<sup>13, 14</sup>. Music Therapy stimulated hippocampus, cerebral cortex and medullary centers, thereby improving co-ordination of various body parts<sup>4</sup>. Listening to pleasant and relaxing music also enhanced the recovery of cardiovascular and respiratory functions and decreased cortisol levels after stress<sup>15</sup>. Thus, Music Therapy appears to possess promising anti-depressant potential.

### How Music Therapy Helps in Depression?

Music is a form of sensory stimulation, which provokes responses due to familiarity, predictability & the feeling of security associated with it.

1. Music Therapy improves the onset & quality of sleep<sup>16</sup>.
2. Music Therapy facilitates & restores motor skills<sup>13</sup>.

3. Music Therapy significantly lowers blood pressure & heart rate ( Present study)
4. Melatonin synthesis and release is enhanced by Music Therapy<sup>15</sup>.
5. Music listening leads to increased dopamine synthesis in the brain<sup>9</sup>.
6. Listening to music decreases the levels of cortisol, ACTH, Epinephrine and
7. Nor epinephrine, the stress hormones<sup>15, 4</sup>.
8. Passive music listening spontaneously activates limbic & paralimbic systems resulting in pleasant feelings<sup>4</sup>.
9. Music Therapy stimulates both the hemispheres of brain, hippocampus, cerebral cortex and medullary centers, thereby improving speech, language skills & self esteem<sup>4</sup>.

**CONCLUSION:** In conclusion, this study provides clinical evidence for the application of devotional music in managing patients suffering from depression. Music has the unique capability of bringing back the charm and making the life worth living for depressed patients. This therapy is now being recognized globally. An extensive research is in progress to reveal its new dimensions.

### How Music Therapy is superior to other therapies?

1. Music captivates and improves attention<sup>4</sup>.
2. People of all abilities, ages and communities can participate in this therapy.
3. It provides a safe social setting for verbal and non- verbal communication.
4. It initiates and encourages physical movements of the body.

5. It helps in recalling past memories and excites emotions<sup>4</sup>.
6. It is the best way of utilizing the time, particularly at advanced age.
7. It provides a pleasant & meaningful context for sensory, short term & long-term memory<sup>10</sup>.
8. It provides dramatic relief without any side-effects
9. It employs non-invasive, natural and pleasure some experience.

**ACKNOWLEDGEMENTS:** The authors are highly grateful to Dr. Narender Gupta, MD (psychiatrist), Dr. S. K. Bharti (clinical psychologist) and Ms. Madhu for their kind help.

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