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## The Arts in Psychotherapy



### Effects of music therapy on depression compared with psychotherapy

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#### ABSTRACT

This paper reports a study testing the effects of music on depression and compares them with the effects of psychotherapy. There are mainly three conventional treatments for depression: psychotherapy, pharmaceutical treatments, and electroconvulsive therapy. Because conventional treatment has proven to be poorly successful, new means of treatment must be found that might improve depression when used together with other therapies. A randomized controlled clinical trial was performed with a convenience sample of 79 patients aged 25–60 years with low- and medium-grade depression. The Zung Depression Scale was employed for selection purposes. Patients were randomly assigned to the music-therapy group (classical and baroque music) ( $n = 41$ ), or the psychotherapy group based on conductive-behavioral therapy ( $n = 38$ ). The music therapy was applied for 50 min a day, every day, for eight weeks. At the end, the music-therapy group had less depressive symptoms than the psychotherapy group, and this was proven to be statistically significant with the Friedman test. We propose that patients with low- and medium-grade depression can use music to enhance the effects of psychological support.

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#### Introduction

In this changing world, increasingly severe changes are occurring in the frequency and types of stressors which, combined with certain personal vulnerabilities, are causing a general rise in depressive symptoms. Depression is a chronic disorder that can affect anyone of any age. Some risk factors are, family history of depression, female gender, childhood abuse or neglect, stressful life events, and chronic illness, which, if appearing, in childhood and adolescence, represent a risk for recurrent depressive disorders in adulthood (Hankin, 2006). There are three main effective treatments for depression: drug treatment, psychotherapy, and electroconvulsive therapy (Fountoulakis, Grunze, Panagiotis, & Kaprinis, 2008). The common triggers of depressive episodes include the following: divorce or separation from a romantic relationship, serious financial problems, physical disease, problems at

home, being laid off, marital problems or problems in an affective relationship, conflicts or difficulties at work, and negative events involving a close person, such as a relative or a close friend. Pharmaceutical treatments for depression, using either tricyclic antidepressants or selective serotonin reuptake inhibitors (Ferguson et al., 2005), make no difference in the odds ratio of suicide attempts. Music, on the other hand has been found to be effective for several disorders, like the management of acute pain (Koch, Kain, Ayoub, & Rosenbaum, 1998), cancer pain (Zimmerman, Pozehi, Duncan, & Schmitz, 1989), and labor pain (Phunmdoung & Good, 2003). This beneficial effect has been in part explained by the response to music and the physiological connectivity of the mesolimbic system, which provokes pleasurable experiences (Menon & Levitin, 2005).

Music therapy is the planned use of music to achieve therapeutic outcomes. In mental health services, music therapy is regularly offered through group and individual programs following a process of referral and assessment (Odell-Miller, 1995). Several studies describe the effect of music on mental states; for example, Mozart's Sonata for two pianos in D major K. 448 has been largely associated with the 'Mozart effect' condition, which has proven to enhance brain capacity by activating several signal pathways (Jaušovec,

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**Table 1**  
Demographic characteristics of the subjects included in this study.

Variable	Group assignment					
	MT (n = 41)			PT (n = 38)		
Gender	Men	Women	Total	Men	Women	Total
Age (years)	8	33	41	6	32	38
25–35	2	12	14	0	12	12
36–45	3	12	15	1	9	10
46–60	3	9	12	5	11	16
Educational level						
<Bachelor's	3	6	9	1	10	11
Bachelor's	1	4	5	1	9	10
2–4 years in professional	4	17	21	4	13	17
>4 years in professional	2	4	6			
Marital status						
Married	3	18	21	5	20	25
Separated	0	0	0	0	4	4
Widow	1	2	3	0	2	2
Common-law marriage	5	6	11	0	4	4
Other (single)		5	5	1	2	3
Annual income (\$, Mexican pesos)						
<60,000.00		6	6	6	8	14
60,000.00–100,000.00	9	23	32	6	15	21
>100,000.00		3	3	1	1	2

MT, music therapy; PT, psychotherapy.

Jaušovec, & Gerlic, 2006). Bach's Italian Concertos have demonstrated their effectiveness in recovering memory in adults with neurodegenerative disorders (Williamon & Valentine, 2002), and Corelli's Clavier Sonatas have been employed to enhance neuronal development in premature babies (Aikman, Nolte, & Dorfling, 1997). In the same way, music could have beneficial effects on some other neurological disorders like depression.

Few research studies have assessed the effects of music therapy on depression. No adverse effects for music therapy have been reported so far, whereas music therapy can indeed exert a positive effect on mental health (Edwards, 2006). In one study, adolescent women, randomly assigned to either massage or music therapy treatment, were noted to have a reduction in right frontal electroencephalography (EEG) scores after only 20 min of music listening while behavior and self-evaluations of mood states remained unchanged (Field et al., 1998). Moreover, music therapy was used over a two-week period with patients with major depressive disorders. Depressive scores for the music-listening group were significantly reduced, as were their sub-scores of depression in comparison with controls (Hsu & Lai, 2004). People with chronic non-malignant pain exposed to music showed more power and less pain, depression, and disability than the control groups (Siedliecki & Good, 2006). We compared the effects of music therapy and psychotherapy in a group of subjects with low and medium levels of depression from the city of Huajuapán de León, Oaxaca, Mexico. Our study is based on the fact that music can stimulate and activate signal pathways, which can, in turn, modulate chemical mediators; thus, facilitating recovery from depression or diminishing its symptoms.

## Subjects and methods

Patients (n = 79) selected for the study were from a clinic-hospital belonging to the ISSSTE (for its initials in Spanish: Institute of Social Security and Services for Government employees) in Huajuapán de León, Oaxaca, Mexico. Approval for the study was obtained from the Institutional Review Boards for the Master's in Sciences Program of the School of Medicine and Surgery of the UABJO (Benito Juárez Autonomous University of Oaxaca), Oaxaca, Mexico. The study was also approved by the Ethics Committee of

the corresponding health care institution. During the initial interviews, potential recruits were given an oral description of the study and, if interested in participating, they were given a copy of the consent form to review together with the researcher, and had the opportunity to ask questions. A signed consent form was obtained from all participants, whether they agreed or not to participate in the study; the data-collection instruments did not contain any identifying data; and all results of this study are reported as supplemental information.

An expert in psychology, with more than 10 years of experience in the diagnosis of psychological disorders, identified all patients to select only those with low and medium levels of depression. Patients were included only if they were not on any drug therapy or were not suffering from any other neurological pathologies or disturbances that could pose a problem for treatment. Two randomized groups were established: the music-therapy (MT, n = 41) group and the psychotherapy (PT, n = 38) group. Data from both groups are summarized in Table 1. Sociodemographic aspects, as well as the history and intensity of current and past depressive disorders, were evaluated during the interviews.

## Psychological interview

The initial selection was performed by applying the Zung Self-rated Depression Scale. We carefully monitored all patients to detect any discomfort, stress, or unrest, and provided all necessary attention and support. Every week, patients were evaluated using the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). The Beck Inventory is self-rating and was used in this study to evaluate the intensity of depressive symptoms based on patient perception. We also made a final evaluation using the Hamilton Depression Scale (Williams, 1988). The Hamilton Scale was used in this study to quantitatively evaluate the depressive symptoms. The Zung Scale and Beck Inventory were self-rating, and a member of the research team applied the Hamilton Scale.

The improvement criteria in the Beck Depression Inventory were measured by the total scores reported: 0–13 minimal depression, 14–19 mild depression, 20–28 moderate depression, and 29–63 severe depression. MT patients showed changes in their final scores that suggested improvement. Higher total scores indicate

**Table 2**

The progressive effect of music therapy or psychotherapy over eight weeks of treatment. MT patients show a decreased score on the Hamilton scale; when both groups were compared via the Friedman test, the  $p$ -value was 0.0356, considered statistically significant.

Session number	MT		PT	
	Subjects without improvement	Subjects with improvement	Subjects without improvement	Subjects with improvement
3rd	38	1	37	0
5th	34	3	27	3
7th	19	16	19	10
Final	4	29	16	12

MT, music therapy; PT, psychotherapy.

more severe depressive symptoms. The improvement criteria in the Hamilton Depression Scale were measured by the total scores: 0–7, generally accepted to be within the normal range (or in clinical remission); 20 or higher, moderate severity.

An expert psychologist at the health care center in Huajuapán de León, Oaxaca, Mexico, provided psychotherapy through individual sessions at the clinic. The psychotherapy method was of the conductive-behavioral type and consisted of 30-min sessions once a week. Evaluations were made weekly. As with the other group, we carefully monitored all patients to detect any discomfort, stress or unrest, and provided all necessary attention and support.

#### Music therapy

The therapist only monitored the development of the musical session and took care that there were no factors of inconvenience or stress. The music-therapy group was exposed to a selection of baroque and classical music. Baroque (Johann Sebastian Bach's Italian Concerto in F Major, BWV 780; Arcangelo Corelli's Concerto Grosso in D Major, Op. 6) and classical music (Wolfgang Amadeus Mozart's Sonata for Two Pianos in D Major, K. 448) were selected according to some other studies on their beneficial neurobiological effects. Music exposure was provided in single, self-administered 50-min sessions once a day at home, and one group session per week at the hospital. Patients were provided with a comfortable environment, with no distractions or stressful factors. The therapy was given over eight consecutive weeks.

#### Data analysis

Data were entered into GraphPad Prism Version 5.0 for Windows (GraphPad Software, San Diego, CA, USA). Friedman's test was used to test the research hypotheses.

#### Results

The sample ( $n=79$ ) consisted of 41 participants in the music-therapy (MT) group, and 38 in the psychotherapy (PT) group. Sample characteristics are summarized in Table 1. The sample included 14 men and 65 women, ranging in age from 25 to 60 years, with a mean age of 42.5 years. The duration of depression symptoms reported by the participants ranged from 6 months to 3 years, with a mean of 20 months. Of the 79 participants, 46 were married, 15 had at least a high school education, and 20 reported a family income of <60,000.00 Mexican pesos per year. A number of patients (43/79) reported that the initial cause of their depression were unknown, and more than half (67/79) of them reported that they had never received a depression-related diagnosis. Due to cultural and social reasons, this type of population does not seek care for what they consider to be emotional or psychological alterations. They came to the psychology service for the first time and, in this way, they were recruited. The reasons for consultation were symptoms of fatigue, lack of self-esteem, sensation of emotional

discomfort. After the interview and careful physical and medical examination, the diagnosis of depression was established. Of the 79 subjects, 67 answered that they did not know they were suffering from depression, 5 understood that something was wrong, although they had not thought to ask for help. Patients were monitored weekly via application of the Beck Depression Inventory. We found positive changes at the fourth session in the MT group, with the participants showing improvement in their symptoms. Between the seventh and eighth weekly sessions, we observed improvement in 29 participants, with a lack of improvement in 4, and 8 abandoned the MT group. In contrast, the PT group gave a final result of 12 subjects showing improvement, 16 without improvement, and 10 abandoned the study (Table 2).

When we compared the MT and PT groups with the Friedman test, we found the  $p$ -value to be 0.0356, considered statistically significant in favor of the music therapy treatment.

#### Discussion

Our results show a statistically significant effect for music, with the music-therapy group revealing a better improvement in their symptoms than the psychotherapy group. At the beginning of the study, many of the chosen patients did not show a good disposition to listen to the music, but, later on, they not only proved to be interested parties, but also asked for more music of this type. Statistical differences were found between both groups. Our findings extend the knowledge derived from previous studies by showing that Classical and Baroque music not only decrease the frequency of depressive symptoms, but also stimulate beneficial feelings and decrease levels of depression.

Music offers a simple and elegant way to treat anhedonia, the loss of pleasure in daily activities. Music has been used to treat a number of mental disorders including depression, schizophrenia, and bipolar disorder. Musical stimuli, such as those used in the present study, could be used to treat depression in conjunction with other forms of therapy.

A number of neuropeptides, including dopamine, are involved in producing the pleasurable sensations that enhance positive emotions and diminish depressive states (Burgdorf & Panksepp, 2006). Moreover, low levels of dopamine in the brain (Nestler et al., 2002) and a low number of dopamine receptors (Gotlib, Joorman, Minor, & Hallmayer, 2008) constitute two of the main causes of depression. Mozart's music improves dopaminergic neurotransmission, and regulates and/or affects various brain functions, and might, therefore, be effective for eliminating symptoms in a number of diseases that involve dopaminergic dysfunction (Sutou & Akiyama, 2004), including depression. Depression is often accompanied by a lack of interest in pleasurable stimuli. The hedonic aspect of reward is thought to be modulated by endogenous opioid peptide transmission within the nucleus accumbens, which, in turn, is known to be regulated by dopaminergic input from the ventral tegmental area (Kelley & Bridge, 2002). Music activates brain regions involved in reward and emotion, and can provoke intensely pleasurable responses in these areas (Blood & Zatorre, 2001). Music is clearly

a means for increasing positive affect and, in this way, we come to understand why it reduces depression.

Another fact about music is that it can activate several processes, which facilitate brain development and/or plasticity. Depressive disorders have a neurochemical basis and have been associated with regional reductions in central nervous system volume, as well as in the number and/or size of glia and neurons in discrete brain areas (Manji, Drevets, & Charney, 2001). Experimental and clinical studies have shown that signaling pathways involved in regulating cell survival and cell death are long-term targets for the action of music. At this point, exposure to music enhances neurotrophins, such as brain-derived neurotrophic factor (BDNF) and nerve growth factor (NGF) production in the hypothalamus (Angelucci, Ricci, Padua, Sabino, & Tonali, 2007). Mozart's music has been proven to enhance BDNF and its receptor, called TrkB (Chikahisa et al., 2006), as well as synaptophysin expression (Rickard, Toukhsati, & Field, 2005), syntaxin, and the anti-apoptotic Bcl2 protein (Alladi, Roy, Singh, & Wadhwa, 2005). On the other hand, psychotherapy improves post-treatment responses for depressed patients, but benefits are not sustained at longer-term follow-up (Merry, 2008). Because music can stimulate some brain areas strongly related with reasoning and cognitive function, it not only reduces depression, but can also repair neurodegenerative disturbances in brain cells by anti-apoptotic and neurotrophic factor expression, thereby facilitating neurogenesis, regeneration, and repair of neurons (Fukui & Toyoshima, 2008).

The major limitation in this study was the relatively small sample size. However, the observed differences in depression between the music-therapy group and the psychotherapy group were strong. In addition, most participants in the MT group showed less depressive symptoms than the PT group. Our results coincide with other studies that reveal the use of music to assist patients in relaxation. People who treat depressed patients could use music to enhance the effects of decreased depression and disabilities, and promote feelings of power.

Depression remains a major health problem and, despite using pharmaceutical agents, patients continue to report high levels of unrelieved depression. In conclusion, we consider that music is safe, inexpensive, and easy to use for and by patients. Music alters a number of behavioral and disability patterns associated with depression and self-administered music treatment can facilitate the decrease of depressive symptoms. In addition, self-administered music sessions allow patients the freedom to schedule their music therapy at times when it is most convenient and, perhaps, at times when it is most needed. Specific selections or types of music may have different effects on different people, and may provide different effects for the same people at different times. Our results strongly suggest that some Baroque music and the music of Mozart have conclusive beneficial effects on depressed patients.

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