



# Influence of a Music Therapy Program to Prevent Somatic Symptom Disorder Pain: An Experimental Study

Bin Wu\*

## ABSTRACT

This study aimed to develop an effective therapy program for preventing the somatic symptom disorder during the everyday life. Our experimental study randomly assigned the sample of 27 academic students referred to psychiatric clinic to a standard care (n=14) and intervention group (n=13). Students assigned to the music therapy intervention showed a increase in perceived relaxation (pretest: M = 4.35, SD = 0.55; posttest: M = 4.52\*\*, SD = 0.31) and a lower pain intensity (pretest: M = 3.26, SD = 0.33; posttest: M = 3.22\*, SD = 0.48). A therapy program composed of musical stimulations may prevent perceived pain in students with somatic symptom disorder. This program can be recommended to academic students in order to prevent psychosomatic pains.

**Key Words:** Somatic Symptom Disorder, Music Therapy, Perceived Relaxation, Perceived Pain

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## Introduction

Physical pains are common among people, and they do not have physical foundation. Much of these physical problems currently come from daily stresses of life. As studies have shown, back pain and increased blood pressure are directly related to life stress (Sarno, 2009), named as somatic symptom disorder.

Patients with somatic symptom disorder usually have multiple and current physical symptoms that are uncomfortable or lead to a significant discomfort in daily life, although sometimes there is only a severe symptom (mostly pain). The symptoms may be identified (such as localized pains) or unknown (such as fatigue). The symptoms sometimes reflect normal feelings or physical discomforts that generally don't imply serious illness. Physical symptoms without obvious medical justification are not

enough to diagnose. The suffering of the person is real, whether medically justified or not (American Psychiatric Association, 2013). In the process of forming this disorder, it is assumed that physical disorders are affected by biological, psychological-behavioral and social factors (Levenson, 2006). There are many indications that almost all range of pain and illness can be due to mental factors (Bejarpas et al., 2017; Fattahi et al., 2017), as many studies have shown the relationship between somatic symptom pains and mental complaints (Margalit et al., 2014; Gerrits et al., 2015; Alfvén, Östberg & Hjern, 2008; Gao, 2017) that is associated with different prevalence in the two sexes (McCall-Hosenfeld et al., 2014) and high risk of physical illness (Alfvén, 2012).

**Corresponding author:** Bin Wu

**Address:** Department of Basic, Shandong Women's University, Jinan, 250300, China

**e-mail** ✉ wubin7116@163.com

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Nowadays, the tendency to use non-pharmacological methods of pain relief is increasing. One of these methods is the use of pleasant sound stimuli, named as music therapy (Nilsson et al., 2003). Human has always used music to express his thoughts and feelings (Choi, 2008). The use of music, as a therapeutic method, has a historical background (Baranson and Timy, 2003). Further, the old inscriptions in Egypt, Greece, China, India and Rome mentioned music as a healer. Music has always had a relaxing and delightful role in human life. It leads to a decrease in heart rate, deeper respiration, anxiety, depression and as well as pain relief, in addition to creating vitality and enhancing feelings of sympathy (Johnson, Raymond & Goss, 2012; Winter, Paskin & Baker, 1998; Chen 2016; Peng 2016).

There are different types of music that each of them has different effects on mind and body, and the effects be can be used for therapeutic works in the field of counseling and psychotherapy (Krout, 2007). DeCharms et al. (2005) pointed the relationship between pain experience and brain GEE activity as well as the relationship between active change in brain frequencies and pain relief among patients. In general, there are two kinds of music therapies due to activity type of participants, including active music therapy (singing, playing or composing) and inactive music therapy (listen to recorded or live music). About inactive music therapy, Kenyon (2007) emphasized that participants should love the music.

The use of music to relieve pain is one of the most common and easiest methods of intellectual deviation (Parker, 2004), because music creates a synchronization with different bio rhythms unconsciously, in addition to emotional effects on humans. These effects include a variety of voluntary movements such as walking, knocking, shaking head, etc. Studies reported specific effects of the automated nervous system (Bergstrom et al., 2013). Maybe it can be said that music affects the mind before thoughts and feelings. These musical provocations simultaneously stimulate the upper and lower centers of brain as it leads to the production of a personal harmony.

Many studies reported positive effects of music on various forms of somatic symptom diseases, such as chronic pain (Siedliecki & Good, 2006), cancer pain (Kenyon, 2007), and pain perception (Hauck et al., 2013). Ciocal (2013) reported that music therapy can be considered as

an important method in treating somatic symptom disorders because of creating mental health and increasing ability to concentrate and plan that help the person to express feelings and thoughts. Some studies demonstrated positive effects of a music therapy on mental health, and nowadays a wide range of recent studies have studied how making or listening to music affects health improvement (Raymond, MacDonald & Wilson, 2014). However, research on the effect of music therapy on physical symptoms is still useful.

With respect to the occupational context, music listening is a predictor of perceived pain in process of music therapy, with perceived relaxation as a mediator between music listening and perceived pain. Better music listening is expected to lead to more perceived relaxation; more perceived relaxation should lead to less perceived pain (Hauck et al., 2013; Bergstrom et al., 2013; Heidarabadi, 2017). A negative relationship between perceived relaxation and different indicators of perceived pain was supported by the occupational context (Krout, 2007).

Our experimental study aims to test the effects of a music therapy on perceived pain for academic students. Our study used the variable pain intensity (Takata and Sakata, 2004; Dohrenwend, 1980). We also included perceived relaxation as an important relaxation-related outcome variable. For our sample of academic students with somatic symptom disorder, who have multiple and current somatic symptoms, we expect growing stresses during the everyday life. We used the variable stresses (Takata and Sakata, 2004; Gao 2017).

## Methods

### *Design*

An experimental trial was conducted from June to July 2016 at four Psychiatric Clinic centers, in Shanghai, China's biggest city. In this study, we used a pre-training/post-training, with a control group and intervention group and focused on the differences between the music group and the control group regarding the effectiveness of the music therapy.

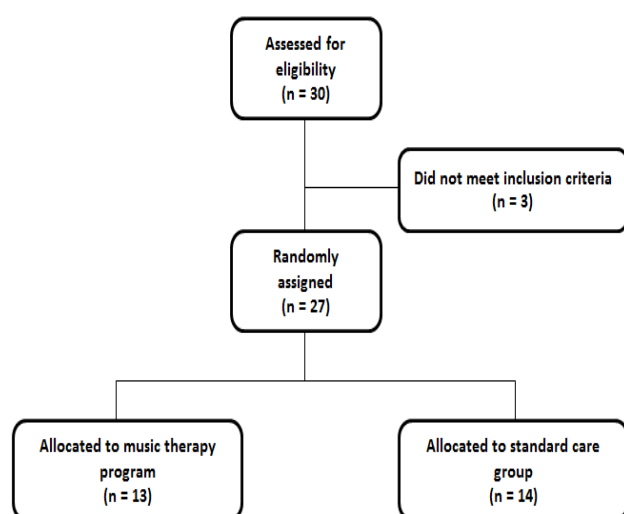
### *Participants and Procedure*

Research has proved that music relieves somatic symptom pains in people with young, middle and old ages, but it is unknown whether the music therapy can result in academic students. Therefore, our experimental study aims to



evaluate whether music therapy can improve somatic symptom disorder in academic students referred to four psychiatric clinic centers with conditions such as chronic pain (CP), tension headache (TH) and pain perception (PP). Many academic students with somatic symptom disorder, including patients with CP (about 22%), TH (about 41%) or PP (about 53%) from the psychiatric clinic centers in Shanghai, were interviewed to recruit suitable volunteer sample. We selected an appropriate age group (mean age = 24.5) and excluded unsuitable music-training subjects. Before participating in this experimental study, the participants signed all training-related subjects. There were no differences concerning sexes, ages and disease types.

For the music therapy group, we implemented a 25-days music therapy program to relieve somatic symptom pains in academic students > 22 years of age. For the control group, we provided a non-music standard care program to relieve somatic symptom pains. Groups of 5 participants with CP, TH or PP were separately selected to join the music therapy groups and standard care groups. All patients of this study signed institutional review board agreements before participating in this study. The sample invited of 30 academic students with somatic symptom disorder, all in students > 22 years of age to participate in this study. Two participants in the music therapy group and one participant in the standard care group were withdrawn from this study. Finally, 13 participants were included in the music therapy group, and 14 were included in the standard care group (Fig. 1).



**Figure 1.** Flow of sample through this study.

### *The program*

Participants in the intervention group participated in a 25-day program. The

participants listened to music for 30 minutes. In this research, music, including Mozart's Sonata K.448 and a number of Baroque pieces (Bach and Corley) that were selected based on the therapeutic results obtained in other studies, was used for therapeutic purposes. Before the intervention, training-relaxation techniques were taught, and they were asked to listen to the music presented to the participants as a compact disc. They practiced and listened the relaxation techniques, 5 days per week in an appropriate time and place condition. In the intervention, the first session was performed in a group, and the rest was practiced at home individually during for 5 weeks.

### *Measures*

Pain intensity was measured with a Japanese version of the Takata and Sakata's psychosomatic complaints scale (Takata and Sakata, 2004). The scale is short and detects somatic symptoms in a short time. It consists of 30 sections, having a single-agent structure. The Japanese scale ranges from 1 (never) to 3 (frequently) with a range from zero to ninety. The makers of this scale obtained a synoptic validity of 0.64 and 0.65 by calculating the correlation coefficient with the Goldberg Mental Health Scale in two separate studies, the first study in 1990 and the second study in 1999. By examining the structural validation of the scale in these studies, they concluded the explanation of the factor variance, 34.1% in the first study and 31.1% in the second study. They also used the factor analysis to determine the structure's validity, and the results showed that the best arrangement of agents is obtained in the one-factor structure. While the Cronbach Alpha coefficient on this 30-part scale was obtained more than 80 percent, its retest reliability showed an acceptable value. The reliability of this scale was confirmed by Cronbach's alpha coefficient obtained in different years, such as 0.93 in 1997, 0.91 in 1998, and 0.92 in 1999. Takata and Sakata (2004) reported the correlation between the sections of the scale equal to 50% or more, with three different implementations.

### *Data collection and analysis*

We collected outcome data by the trainers. If some data of this study were missing from the clinic notes, students were telephoned at university or home. All data were analyzed with 2 × 2 MANOVA with the time of measurement (before and after intervention).



**Table 1.** Characteristics of participants (age, gender, disease type and field of Study).

Variables		All participants		Music therapy group		Standard care group	
		n = 27		n = 13		n = 14	
		n	%	n	%	n	%
Age, mean (SD)		24.5	5.4	23.8	6.22	24.1	4.02
Gender	Male	14	51.8	7	53.8	7	50
	Female	13	48.2	6	46.1	7	50
Disease type	CP	3	11.2	2	15.4	1	7.1
	TH	10	37	4	30.8	5	35.8
	PP	14	51.8	7	53.8	8	57.1
Field of Study	Psychology	5	18.6	2	15.4	2	14.3
	Medicine	13	48.1	6	46.1	8	57.1
	other	9	33.3	5	38.5	4	28.6

**Table 2.** Average scores and standard deviations of the music therapy group and standard care group

Variables	Music therapy group (n=13)				Standard care group (n=14)			
	Pretest		Posttest		Pretest		Posttest	
	M	SD	M	SD	M	SD	M	SD
Stresses	3.41	0.44	3.45	0.36	3.47	0.61	3.56*	0.57
Pain intensity	3.26	0.33	3.22*	0.48	3.24	0.28	3.41**	0.37
Perceived relaxation	4.35	0.55	4.52**	0.31	4.36	0.48	4.21*	0.49

\* $\rho < 0.05$ , \*\* $\rho < 0.01$

### Findings

Twenty seven students with somatic symptom disorder were approached and consented to participate in the experimental study which ran from June to July 2016. There were 13 students allocated to the music therapy group and 14 to the standard care group. Characteristics of the students who participated in our study are shown in Table 1. The table shows that there are no differences concerning age (music therapy group: M= 23.8, SD = 6.22; standard care group: M= 24.1, SD = 4.02), gender, type of disease and field of Study.

As would be predicted by the two-way MANOVA with group membership as a between-subject factor, significant differences between before therapy and after therapy were found for the music therapy group but not for the standard care group. There were also no significant differences between the music therapy group and the standard care group before therapy, but significant differences after therapy. This would suggest that the music therapy group and the standard care group had similar conditions of times and spatial before therapy but the music therapy group had significantly improved when measured after therapy.

The findings show that there is a significant increase of stresses in the standard care group (pretest: M = 3.47, SD = 0.61; posttest: M = 3.56\*, SD = 0.57). In the music therapy group, there is a nonsignificant increase of stresses (pretest: M = 3.41, SD = 0.44; posttest: M = 3.45, SD = 0.36). Analyses in respect of pain intensity revealed no significant difference between the

music therapy and standard care groups before therapy (music therapy group: M = 3.26, SD = 0.33; standard care group: M = 3.24, SD = 0.28), but a significant difference after therapy (music therapy group: M = 3.22\*, SD = 0.48; standard care group: M = 3.41\*\*, SD = 0.37). Analyses in respect of perceived relaxation revealed no significant difference between the music therapy and standard care groups before therapy (music therapy group: M = 4.35, SD = 0.55; standard care group: M = 4.36, SD = 0.48), but a significant difference after therapy (music therapy group: M = 4.52\*\*, SD = 0.31; standard care group: M = 4.21\*, SD = 0.49). The analysis revealed no significant interactions, suggesting that most males and females students experienced high levels of stresses and high levels of perceived pain sometimes and often.

### Discussion

Previous study has suggested that higher levels of ability music listening and pain relief are desirable for a number of important reasons associated with feelings-related outcomes (Krout, 2007), but until now there have been few research showed increase levels of music listening and pain relief through therapy or training. Our therapy program has focused on a strong theory and was evaluated using the tools suggested in previous studies (Takata and Sakata, 2004). The findings of our study demonstrate a benefit for academic students with somatic symptom disorder in the music therapy group. In this group, there was a nonsignificant increase in stresses, a significant decrease in perceived pain



and a significant increase in perceived relaxation after the intervention. In standard care group, although improvements in somatic symptom disorder are not as degree as the music therapy group, there are positive improvements in our study. This could be explained by self-efficacy that might be increased in the standard care group through the development of appropriate strategies to achieve one's goals, which might lead to less perceived pain. Compared to the previous music-based interventions, our study carried out over 5 weeks and had important effect on the findings: students needed a longer period of therapy in order to develop vitality and sympathy feeling.

As expected, the everyday pressures in university and life are marked by a strong increase in stresses for students with somatic symptom disorder in the standard care group. It is quite reasonable that discomfort, suffering and fatigue in their life, as well as feeling-related stresses, and other new problems are potential somatic symptom for most of the students with somatic symptom disorder. Our first hypothesis was that such potential somatic symptom disorder causes should go along with an increase of stresses among the sample. Although there was an increase of stresses in the music therapy group, the increase was a slight tendency and also non-significant. We found a significant increase of stresses in the standard care group, which supported our first hypothesis. The music therapy program seems to lessen the increase in perceived stresses. While for all participants similar stresses occurred in the everyday pressures, the music therapy program might have been useful for perceiving stresses as deal with life and university problems. Our second hypothesis was that increase in everyday stresses and pressures was reflected by an increase in pain intensity in the standard care group. We found no increase in the music therapy group. This is a clear evidence for the effectiveness of our music therapy program on somatic symptom pains. The result in the standard care group shows that the development without the music therapy program would be marked by a significant increase in pain intensity. The students of the music therapy group showed no such increase. The results of this research are in line with the results of previous studies (Krout, 2007; Ciocal, 2013; Bergstrom et al., 2013; Hauck et al., 2013; Raymond, MacDonald & Wilson, 2014; Chen 2016).

### **Limitations and future directions**

We focused on data gathered from a single source in our study. Besides these data the use of multiple source methods can develop the findings. Another limitation of this research is the reliance on pain intensity and perceived relaxation as dependent variables. The impact of music therapy intervention on academic performance would create greater confidence in the findings.

### **Conclusion**

For the students in our study a music therapy program based on music listening exercises and relaxation-related techniques appears to reduce perceived pain and increase perceived relaxation. Our findings conclude that a music therapy intervention program of 5-weeks can protect academic students with somatic symptom disorder from an increase in perceived pain during everyday life.

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