



## Group music therapy for patients with persistent post-traumatic stress disorder – an exploratory randomized controlled trial with mixed methods evaluation

Catherine Carr<sup>1,2\*</sup>, Patricia d'Ardenne<sup>1</sup>, Ann Sloboda<sup>3</sup>,  
 Carleen Scott<sup>1</sup>, Duolao Wang<sup>4</sup> and Stefan Priebe<sup>1,2</sup>

<sup>1</sup>East London Foundation NHS Trust, London, UK

<sup>2</sup>Unit for Social and Community Psychiatry, Queen Mary, University of London, UK

<sup>3</sup>Guildhall School of Music & Drama, London, UK

<sup>4</sup>London School of Hygiene and Tropical Medicine, London, UK

**Objectives.** Not all patients with post-traumatic stress disorder (PTSD) respond to cognitive behavioural therapy (CBT). Literature suggests group music therapy might be beneficial in treating PTSD. However, feasibility and effectiveness have not been assessed. The study objectives were to assess whether group music therapy was feasible for patients who did not respond to CBT, and whether it has an effect on PTSD symptoms and depression.

**Design.** The study employed mixed methods comprising of an exploratory randomized controlled trial, qualitative content analysis of therapy, and patient interviews.

**Method.** Patients with significant PTSD symptoms ( $n = 17$ ) following completion of CBT were randomly assigned to treatment ( $n = 9$ ) or control groups ( $n = 8$ ). The treatment group received 10 weeks of group music therapy after which exit interviews were conducted. Control group patients were offered the intervention at the end of the study. Symptoms were assessed on the Impact of Events Scale-Revised and Beck Depression Inventory II at the beginning and end of treatment.

**Results.** Treatment-group patients experienced a significant reduction in severity of PTSD symptoms ( $-20.18$ ; 95% confidence interval [CI]:  $[-31.23, -9.12]$ ) and a marginally significant reduction in depression ( $-11.92$ ; 95%CI:  $[-24.05, 0.21]$ ) at 10 weeks from baseline compared to the control. Patients viewed music therapy as helpful and reported experiences concur with current literature.

**Conclusions.** Group music therapy appears feasible and effective for PTSD patients who have not sufficiently responded to CBT. Limitations include the small sample size and lack of blinding. Further research should address these limitations, test sustainability, and identify specific factors that address symptoms in treatment.

\*Correspondence should be addressed to Catherine Carr, Unit for Social and Community Psychiatry, Academic Unit, Newham Centre for Mental Health, East London NHS Foundation Trust, Glen Road, London, E13 8SP, UK (e-mail: Catherine.Carr@eastlondon.nhs.uk).

Declaration of interest: Catherine Carr and Ann Sloboda are music therapists.

Current National Institute for Health and Clinical Excellence (NICE) guidance for treating post-traumatic stress disorder (PTSD) advocates cognitive behavioural therapy (CBT) (NICE, 2005). However, a small but significant number of patients do not respond sufficiently, and still have significant symptoms after therapy (Harvey, Bryant, & Tarrrier, 2003; Spinazzola, Blaustein, & van der Kolk, 2005). Commonly, these are patients who have had prolonged and multiple exposures to trauma (Robertson, Humphreys, & Ray, 2004; Spinazzola *et al.*, 2005) and those with poor verbal memory (Wild & Gur, 2008). To date, this patient group has no recommended alternative intervention, whilst existing evidence-based treatments for PTSD make no reference to non-responders (Bisson *et al.*, 2007; NICE, 2005).

PTSD is diagnosed using the 4th edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) criteria (American Psychiatric Association [APA], 1994). The person must have directly experienced or witnessed a threat to life, serious injury, or personal integrity, and responded with helplessness or horror. Symptoms must include re-experiencing, avoidance, and hyperarousal, and the person must have significantly impaired social, interpersonal, or occupational functioning. These symptoms are severe and extend at least 12 weeks after the index trauma.

PTSD sufferers often have associated emotions of guilt (including survivor guilt) and shame and experience great fear in being confronted with their traumatic memories. Unknown numbers never reach specialist help because of this. There are many cultural presentations, but these clusters can always be found (d'Ardenne, Capuzzo, Ruaro, & Priebe, 2005). Depression and anxiety are significantly associated with PTSD (Breslau, Davis, Peterson, & Schultz, 1997; Jakupcak *et al.*, 2006; Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995), often requiring medication and additional psychological intervention. Mood disorders are therefore routinely monitored and treated concurrently in interventions.

### **Features of music therapy for PTSD**

Music therapy might be a beneficial intervention for PTSD sufferers for a number of reasons. Patients sometimes perceive talking therapies as distressing and intrusive. Music engages people in a perceived safe and enjoyable context, is universal to all cultures (Blacking, 1973; Pavlicevic, 1997) and lifelong. Music therapy, therefore, offers a means for traumatized people to relate to their healthy identity (Orth, 2005; Pavlicevic, 2002). Above all, it may encourage traumatized people to engage in treatment more than with current NICE-recommended treatments (Gold, Solli, Krüger, & Lie, 2009).

Music therapists work with many different types of trauma, across a broad range of populations including refugees (Dixon, 2002; Jones, Baker, & Day, 2004; Orth, 2001, 2005; Orth, Doorschodt, Verburgt, & Drozdek, 2004; Orth & Verburgt, 1998; Orth, Verburgt, van Nieuwenhuijzen, & Wijzenbeek, 2006; Tyler, 2002), people affected by war (Amir, 1998; Bensimon, Amir, & Wolf, 2008; Heidenreich, 2005; Hughes, 2000; Lang & McInerney, 2002; Pavlicevic, 2002), childhood sexual abuse, and complex trauma (Henderson, 1991; Hussey, Reed, Laymen, & Pasiali, 2008; Macintosh, 2003; Robarts, 2006; Strehlow, 2009; Volkman, 1993). Individual work with children features most prominently. In contrast, most adult studies utilized a group setting, citing potential to address, and improve social interaction (Amir, 1998; Hussey *et al.*, 2008; MacIntosh, 2003; Orth, 2001, 2005; Orth *et al.*, 2004; Orth & Verburgt, 1998; Volkman, 1993). To date, only two studies have examined the use of music therapy to treat adult PTSD patients (Bensimon *et al.*, 2008; Orth *et al.*, 2006).

### **Re-experiencing**

Re-experiencing includes unwanted memories, dreams, smells, images, or sounds of the trauma, as well as dissociative episodes that include 'flashbacks' of the traumatic event where the sufferer cannot distinguish the past from the present. Volkman (1993) suggests that active musical response helps the person to distinguish the present moment from past traumatic events, enabling the patient to remain grounded. Music therapists have observed the potential for music to evoke traumatic memories providing access for discussion and processing of the past (Bensimon *et al.*, 2008; Orth, 2001). Bensimon *et al.* (2008) found traumatic associations elicited by music reduced over the course of therapy. They postulate that the establishment of 'a safe space' might have enabled tolerance of such experiences. Orth (2001) emphasizes music's capacity to evoke emotional responses, and argues that active music making provides a means of control and self-expression of the traumatic memory.

### **Avoidance**

Avoidance includes the use of alcohol or substances to forget the past, or restricting contact with people, places, or events that might elicit a traumatic memory. Sufferers may report 'numbing' of emotional response (APA, 1994). Group music therapy is a social process that addresses the avoidant behaviour of PTSD sufferers. Musical improvisation demands an active response, not just within the music, but to the music and utterances made by others (Orth, 2005; Orth & Verbugt, 1998; Volkman, 1993). Difficulties in engaging and fostering group commitment have been noted, but trust and engagement increase over time (Bensimon *et al.*, 2008; Orth, 2005; Robarts, 2006). Musical structure may address detachment and restricted affect by enabling patients to connect with and express feelings musically (Orth, 2005).

### **Hyperarousal**

Hyperarousal includes sleeplessness, irritability, aggression, poor concentration, and a general mistrust of others, often manifested by hypervigilance and exaggerated startle responses (APA, 1994). Music therapy attempts to address hyperarousal within physical, cognitive, and emotional domains. Hypervigilance and startle responses may be regulated through encouraging tolerance of silence and loud sounds (Hughes, 2000). Poor concentration is addressed through requiring patients to attend to their own sounds and those made by others. The physical experience of attending and partaking in music making requires participants who find it difficult to attend to and concentrate on present stimuli.

Within the emotional domain, musical instruments are used to express feelings of anger and irritability (Bensimon *et al.*, 2008; Orth, 2005; Volkman, 1993). Bensimon *et al.* (2008) found patients favoured loud drumming as a means of expressing anger, resulting in feelings of 'relief, satisfaction and empowerment' (p. 46). Musical components may be combined to lower anxiety and foster feelings of safety. Both Orth *et al.* (2006) and Bensimon *et al.* (2008) suggest that the musical structure can offer safe, predictable limits for expression and experimentation. Orth uses a gradual approach to music-making in therapy, from composition and recording of relaxation music to musical improvisation and song-writing to formulate a narrative of traumatic and autobiographical experiences (Orth *et al.*, 2006). Most pertinently, improvisation in music therapy appears to enable arousal regulation by promoting relaxation (Orth, 2005). Orth (2005) notes that this is

often music that is 'standard instrumental, predictable, of slow pace and with an even rhythm' (para. 32) and observes that patients often chose familiar music associated with pleasant memories or experiences.

### **The current study**

Arts therapists have begun to explore underlying mechanisms in trauma work. Focus has turned to neuroscientific models (Read-Johnson, 2009) and preliminary evidence suggests that music therapy positively affects structures associated with traumatic responses (Krout, 2007; Swallow, 2002). Music therapy might, therefore, be able to modulate and affect responses at an implicit emotional level, an important prerequisite for psychological exploration (Van Der Kolk, 2006). The capacity for music to communicate at a preverbal level may also explain how therapist and patient use music to communicate non-verbally (Hughes, 2002; Malloch & Trevarthen, 2009; Robarts, 2006, 2009; Sutton, 2002).

Group music therapy may better address symptoms of avoidance and limited social functioning, and be a useful alternative to trauma-focused CBT, as the setting uses mainly non-verbal components. However, no randomized controlled trials have been undertaken to validate either its feasibility or effectiveness with PTSD or associated mood changes. The purpose of this trial was to establish whether symptomatic PTSD patients would engage with group music therapy, whether severity of their PTSD and depressive symptoms would change, and to describe their qualitative experiences.

## **Method**

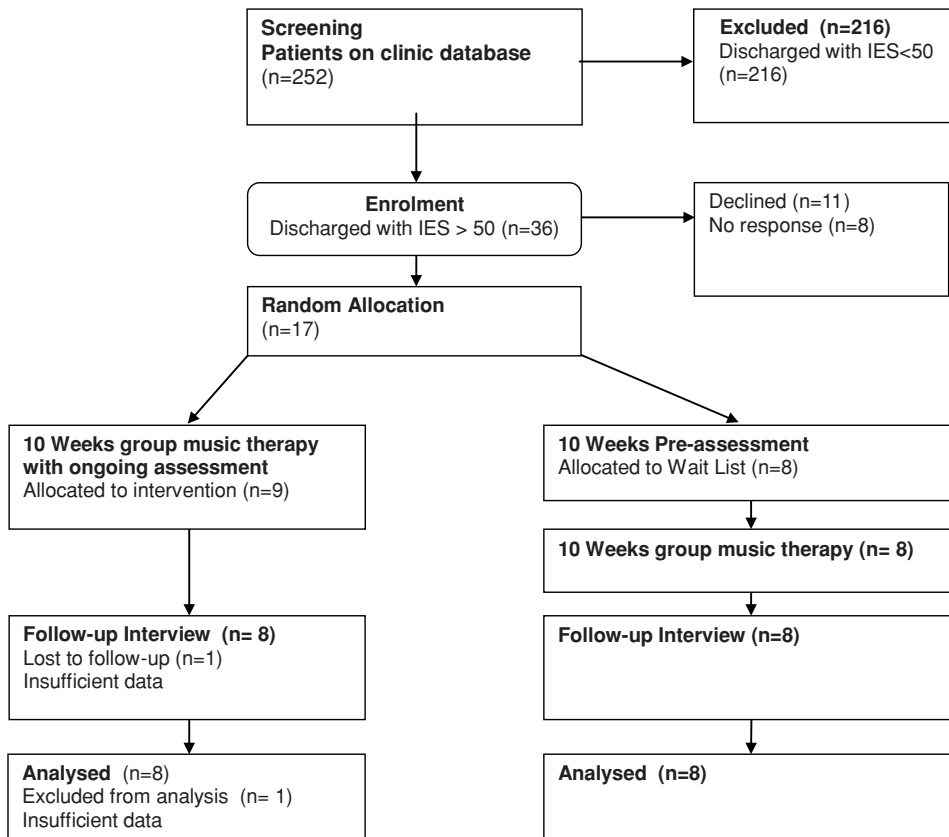
### **Study design**

An exploratory randomized controlled trial was conducted with a waiting group design. The intervention group received weekly group music therapy for 10 weeks after baseline, and outcomes were assessed in both groups at the beginning and end of the 10-week period. Following this, the waiting group also received group music therapy. Content analyses of video recordings, process notes, and exit interviews were conducted for triangulation with quantitative data.

### **Participants and recruitment**

Patients were recruited from a specialized National Health Service (NHS) in London, providing trauma-focused CBT for patients with PTSD (d'Ardenne *et al.*, 2005). Patients were between 18 and 65 years, had basic English, and were receiving no other psychotherapy. All had a PTSD diagnosis, using the Clinician-Administered PTSD Scale (CAPS) (Blake *et al.*, 1990). All had previously received and completed CBT, but retained significant symptoms on discharge, as measured by the Impact of Events Scale (IES score of  $\geq 50$ ; i.e., defined as severe and 15 points above the clinical cut-off for PTSD) (Horowitz, Wilner, & Alvarez, 1979). The study was approved by the East London and the City Local Research Ethics Committee 1 in September 2007.

Patients with a discharge IES score of  $\geq 50$  (Horowitz *et al.*, 1979) were identified from the clinic database. They were sent a letter introducing the study, explaining its rationale, and why they had been chosen, together with an information sheet, consent form, and telephone contact of the clinic. If willing, patients attended a pre-treatment interview at the clinic with a clinician (Pd'A). A complete description of the study was then provided, and written informed consent was obtained. Those who consented then completed the baseline assessment.



**Figure 1.** Consort diagram showing patient flow through study.

Group allocation was made by an independent researcher (CS) who randomly generated a list of consenting names and a sequence of group allocations. Each name was then allocated either to treatment or the waiting list. Patients were paid a single fee at the end of the study: treatment group received £20; waiting group received £30. Patient flow and figures are shown in a CONSORT diagram (Figure 1).

Of 252 patients discharged by the clinic, 36 (14.3%) had a score > 50 on the IES. From these, 17 (47.2%) agreed to participate, and were randomly allocated to a treatment group ( $n = 9$ ) and control group ( $n = 8$ ). Eleven (30.6%) declined to participate and eight (22%) did not respond. One treatment patient attended one session and was then offered care elsewhere. Recruitment was done in September–December 2007; follow-up was completed in March 2008. Patient characteristics taken from medical records are summarized (Table 1). Fourteen patients were taking conventional antidepressants (Treatment: 7; Waiting: 7), four on antipsychotics (Treatment 1; Waiting 3), two on benzodiazepines (Treatment: 1; Waiting: 1), and three on hypnotics (Treatment: 2; Waiting: 1).

### **Procedure**

Data were collected at baseline prior to therapy and immediately after the final session at 10 weeks. The control group was then offered group music therapy. PTSD symptoms

**Table 1.** Demographic and trauma characteristics by group

Characteristics	Treatment <i>n</i> = 8	Wait-list control <i>n</i> = 8
Age (years), mean (range)	34 (20–57)	44 (33–53)
Gender, male ( <i>n</i> )(%)	3 (37.5)	4 (50.0)
Ethnicity ( <i>n</i> )		
White British	2	2
Black African, Caribbean, other black background	3	2
Any other Ethnic Group	3	4
Native English speakers ( <i>n</i> )	4	2
Index trauma ( <i>n</i> )		
Torture	2	3
Civilian casualties of war	2	1
Bullying	1	0
Child sexual abuse	1	1
Rape	1	2
Terrorism	1	1
Intercurrent medication ( <i>n</i> )		
Antidepressants	7	7
Antipsychotics	1	3
Benzodiazapines	1	1
Hypnotics	2	1

were assessed again in this group after treatment completion, that is 10 further weeks after the end of the evaluation period in the randomized controlled trial. All assessments were completed by NHS psychologists (Pd'A, CS, & NW), 30 minutes before the start of the first music therapy group and after the end of the last group. Assessments were conducted via telephone for the control group. Due to the small size of the research team, no attempt was made to mask researchers from patient allocation.

Mean attendance was seven sessions (range; 2–9). Seven (78%) attended seven sessions or more. Despite fluctuating attendance, all maintained telephone contact with the clinic, detailing their challenges. These included educational examinations, difficulties with child care, eviction from home, court attendance, and domestic violence. Patients commenced group music therapy in the neighbouring Guildhall School of Music and Drama, and were escorted there after baseline measures were taken. Both groups were maintained on the NHS clinic caseload with full access to mental health care.

### **Intervention**

Group music therapy was provided by music therapists (AS and CC) 1 hr weekly, for 10 weeks. Music therapy is a postgraduate state-regulated profession in the United Kingdom. Therapists must be skilled, flexible musicians trained to use instruments in a variety of ways to support their patients' activity. The intervention was manualized (Odell-Miller, 2007; Odell-Miller, 2002; Towse, 1997; Wigram, 2004), and off-site supervision was provided by a senior consultant in music therapy (HO-M). Adherence to the manual was monitored through video recording of sessions.

The primary goals of therapy were as follows:

- (1) Foster safety and encourage use of the setting and instruments to communicate, as manifest by regular and complete attendance.

- (2) Increase self-agency and question assumptions of leadership in order to increase independence, autonomy, and initiation of musical ideas.
- (3) Alleviate re-experiencing, avoidance, hyperarousal, and associated depression.

As we wished to examine current use of UK music therapy, our secondary goals were those common to music therapy groups held in UK adult psychiatric settings, that is to:

- (1) offer opportunities for socialisation and support,
- (2) provide experiences of making music leading to potential psychological, physical and emotional benefits,
- (3) utilise music to lower anxiety and enhance self-esteem,
- (4) provide a space to think freely and promote relaxation,
- (5) provide opportunities to speak within a group setting,
- (6) provide the potential for creative play without dependence upon verbal instruction.

The Music Therapy Department of the Guildhall School of Music and Drama provided a wide range of musical instruments including a selection from Africa, India, and Asia and small percussion. Instruments were chosen for ease of accessibility. Many required little or no prior musical knowledge/technique in order to produce a sound (e.g., xylophones, maracas, Indian bells, gato drums, djembe, tone bars, and cabassas). More complex musical instruments (such as a guitar and two pianos) were also available to patients. Physical properties were taken into account with a selection of sizes, resonances, timbres, and methods of sounding (such as those requiring a beater or varying ranges of movement). Instruments were arranged inside a circle of chairs, and patients were free to move around. A video camera was discretely placed in a corner. Latecomers were welcomed and acknowledged within the group.

The methods employed are widely used in psychodynamic music therapy for UK adult mental health care, with a combination of active and receptive activities, and an emphasis on free improvisation (Odell-Miller, 2007; Odell-Miller, 2002; Towse, 1997; Wigram, 2004). Patients were introduced to the instruments and encouraged to improvise, with therapists providing improvised instrumental support. Within musical improvisations, the therapists began by listening carefully to the music and providing close accompaniment. The therapists responded to the music of the group by: (1) imitating an aspect of an individual member's music (e.g., pitch, resonance, or timbre); (2) providing a broader musical structure to encompass the expressions of the group as a whole (Wigram, 2004). The therapists used their primary instruments (flute and piano) to provide musical support as well as the range of percussion instruments. As therapy progressed, the therapists then extended and varied the nature of the musical interaction.

Verbal reflection on thoughts and feelings arising from the musical experience was encouraged but not insisted upon. The therapists used supportive psychotherapeutic interventions, drawing together common themes. Personal statements about symptoms were highlighted and made relevant to the whole group. Once patients had left, the therapists made notes on the group content, process, and notable individual contributions.

### **Outcome measures**

Primary outcome was change at 10 weeks from baseline in total symptom severity score on the IES Revised (IES-R) (Weiss & Marmar, 1996). The IES-R is a 22-item rating scale

to assess distress of PTSD symptoms in the previous 7 days. Items are rated by patients on a Likert scale and scored from 0 to 4. Mean responses are taken for subscales of re-experiencing, avoidance, and hyperarousal. It has good internal consistency (Intrusion  $\alpha = .89$ , Avoidance  $\alpha = .84$ , and Hyperarousal  $\alpha = .82$ ) and construct validity (Creamer, Bell, & Fialla, 2003).

The secondary outcome was change in symptom severity score on the Beck Depression Inventory-II (BDI-II) (Beck, Steer, & Brown, 1996). The BDI-II is a 21-item rating scale to assess self-reported symptom severity of depression. Items are rated on a 4-point scale from 0 to 3. The BDI-II has good internal consistency (coefficient  $\alpha = .91$ ) and construct validity ( $r = .89$ ) (Steer, Ball, Ranieri, & Beck, 1999). Scores indicate depression severity of *minimal* (0–13), *mild* (14–19), *moderate* (20–28), and *severe* (29–63).

### **Qualitative analysis**

Content analysis of video-taped sessions, process notes, and exit interviews focused upon four areas:

- (1) Occurrence and severity of PTSD symptoms; (headaches, sensitivity to sounds, traumatic associations, avoidance of session) to establish presence of symptoms and any change within therapy.
- (2) Leadership; (therapist led, patient led) to evaluate the goal of increasing autonomy.
- (3) Patient experiences of music therapy to better understand subjective experiences.
- (4) Content of interventions and discussions within sessions to describe therapeutic process.

Exit interviews were conducted after the final session of music therapy by psychologists (Pd'A & CS) and consisted of four open-ended questions:

- (1) What was helpful in music therapy?
- (2) What was unhelpful in music therapy?
- (3) What has changed for you since you began to attend?
- (4) What would have made it better in any way?

Sessions were watched sequentially, alongside typed process notes. A data-collection proforma, detailing analysis themes, was constructed and session content analysed. Discussions were transcribed along with a log of events, initial themes defined, and the data re-analysed and coded within these. Three sessions were re-analysed by a psychologist (Pd'A), to check for reliability. Quantitative data were triangulated with discussion transcriptions, process notes, and exit interviews.

### **Statistical analysis**

As this was an exploratory trial, and no empirical data were available to estimate variability of outcomes on which to base a sample size calculation, no formal calculation was performed. The sample size was chosen to maximize the number of possible patients within a group, whilst taking into account limitations of space and possible attrition. Summary statistics were calculated to describe trends and variations of outcome variables comparing both groups. Primary outcome was analysed using a mixed model



with baseline measurement of symptom score as covariate; treatment, period, treatment and period interaction as fixed effects; and subject as random effect. The least square mean (LS), treatment differences in LS means, and their 95% confidence intervals (CIs) were derived from the mixed model. LS mean for each treatment group reflects the within-treatment comparisons between baseline and post-treatment time points in the scores. Secondary outcomes were analysed similarly. Analysis was done on an intention to treat basis.

## Results

### Outcomes

At follow-up, 16 assessments were completed. Table 2 shows the summary statistics by group and mixed model analysis results.

At period 1, on average, patients reported a greater reduction at 10 weeks in symptom severity in the treatment group ( $-24.50$ ; 95%CI:  $[-32.30, -16.69]$ ;  $p = .0001$ ) than in the control ( $-4.32$ ; 95%CI:  $[-12.06, 3.42]$ ;  $p = .2286$ ), representing a statistically significant mean difference of ( $-20.18$ ; [95%CI:  $[-31.23, -9.12]$ ;  $p = .0035$ ]). A statistically significant mean difference was found within all three domains: Avoidance ( $-1.30$ ; 95%CI:  $[-1.79, -0.80]$ ;  $p = .0004$ ); hyperarousal ( $-0.94$ ; 95%CI:  $[-1.64, -0.25]$ ;  $p = .0150$ ); re-experiencing ( $-0.73$ ; 95%CI:  $[-1.44, -0.02]$ ;  $p = .0463$ ]). On the BDI-II, patients reported a greater reduction in symptom severity in the treatment group ( $-8.01$ ) than in the control ( $3.92$ ) demonstrating a marginally statistically significant difference ( $-11.92$ ; 95%CI:  $[-24.05, 0.21]$ ;  $p = .0531$ ).

At period 2, the mixed analysis of symptom changes after the control received treatment showed a mean IES-R significant reduction from baseline of ( $-17.20$ ; 95%CI:  $[-24.94, -9.45]$ ;  $p = .0012$ ). Statistically significant mean differences were again found within all three subdomains: Avoidance ( $-0.74$ ; 95%CI:  $[-1.09, -0.39]$ ;  $p = .0016$ ); hyperarousal ( $-0.82$ ; 95%CI:  $[-1.29, -0.34]$ ;  $p = .0049$ ); re-experiencing ( $-0.77$ ; 95%CI:  $[-1.27, -0.27]$ ;  $p = .0081$ ). A reduction in BDI-II symptom severity ( $-0.71$ ) was also seen but was not statistically significant (95%CI:  $[-9.26, 7.84]$ ;  $p = .8500$ ).

### Qualitative Results

Qualitative analysis provided detailed insights into processes and subjective experiences. Engagement, establishment of safety and trust, identification and expression of emotion, and capacity to tolerate particular sound qualities of instruments emerged as features of importance. An overview of the therapy content and process is presented, followed by content analysis of patient symptoms, experiences during therapy, and exit interviews to provide the context for discussion of these themes.

### Content and process of therapy

Interventions closely followed those outlined in the manual. Sessions 1–2 introduced the group to the musical instruments and improvisation. The therapists directed improvisations, using suggestions aimed to reduce anxiety (e.g., ‘listen to the group and then begin to link the sounds you make to those of others’) and to encourage group cohesion (each member to begin playing gradually over a shared pulse). By session 2, patients began to identify instruments that were difficult to tolerate. These instruments were resonant with high-pitched frequency or loud in volume. From session 3 onwards, the group discovered drumming could facilitate group cohesion and self-expression and enabled members to lead the group. Conflicting preferences for instruments and

**Table 2.** Results from mixed model analysis of change in symptom scores from baseline

Symptom Scores	Baseline (n = 16)	10 weeks follow-up (n = 16)	Results from mixed model analysis*		Difference in LS means (95% CI), p-value
			LS mean**		
			Period 1	Period 2	
<b>IES-R – Total (SD)</b>					
Standard care	58.78 (10.98)	53.12 (9.20)	-4.32 (-12.06, 3.42), p = .2286		-20.18 (-31.23, -9.12), p = .0035
Music therapy	52.69 (13.82)	30.87 (10.6)	-24.50 (-32.30, -16.69), p = .0001	-17.20 (-24.94, -9.45), p = .0012	
<b>IES-R – Re-experiencing (SD)</b>					
Standard care	2.76 (0.601)	2.07 (0.72)	-0.55 (-1.05, -0.05), p = .0355		-0.73 (-1.44, -0.02), p = .0463
Music therapy	2.34 (0.72)	1.34 (0.49)	-1.28 (-1.78, -0.77), p = .0005	-0.77 (-1.27, -0.27), p = .0081	
<b>IES-R – Avoidance (SD)</b>					
Standard care	2.36 (0.60)	2.58 (0.41)	0.23 (-0.12, 0.58), p = .1641		-1.30 (-1.79, -0.80), p = .0004
Music therapy	2.32 (0.75)	1.27 (0.58)	-1.07 (-1.42, -0.72), p = .0002	-0.74 (-1.09, -0.39), p = .0016	
<b>IES-R – Hyperarousal (SD)</b>					
Standard care	2.98 (0.48)	2.83 (0.42)	-0.09 (-0.56, 0.39), p = .6809		-0.94 (-1.64, -0.25), p = .0150
Music therapy	2.57 (0.71)	1.67 (0.59)	-1.03 (-1.52, -0.54), p = .0016	-0.82 (-1.29, -0.34), p = .0049	
<b>BDI-II – Total (SD)</b>					
Standard care	36.47 (10.09)	40.00 (8.37)	3.92 (-4.64, 12.47), p = .3148		-11.92 (-24.05, 0.21), p = .0531
Music therapy	34.85 (8.26)	27.63 (11.19)	-8.01 (-16.58, 0.57), p = .0629	-0.71 (-9.26, 7.84), p = .8500	

Note. \*Mixed model was used for the analysis of change in symptom scores from baseline with baseline measurement of symptom score as covariate and treatment, period, treatment and period interaction as fixed effects, and subject as random effect.

\*\*LS mean = Least Square mean from the mixed model.

IES-R, Impact of Events Scale-Revised; BDI-II, Beck Depression Inventory-II.

negotiation remained a theme for sessions 3–8. Issues of leadership, autonomy, and control were explored. By session 7, the group began consider the use of music to manage and integrate strong emotions and identified instruments that enabled expression of anger (fast, loud music on drums); and relaxation (slow, steady music involving piano, flute, and low-resonant instruments). Sessions 8–10 focused primarily upon these elements along with preparation for ending. Discussions centred around positive effects of music; likes and dislikes of instruments; managing conflict; group strategies to deal with intolerable sounds; keeping out ‘bad’ thoughts; uncertainty in how to experience, express, or name emotions; value of group support and getting in touch with a pre-trauma self and memories.

### **Occurrence of PTSD symptoms within sessions**

#### *Re-experiencing and dissociation*

No instances of dissociative flashbacks were observed within sessions. However, patients often commented upon the music giving them a ‘bad head’ or evoking ‘bad memories’.

#### **Session 3 (after group drumming):**

Patient 1: ‘I didn’t like the drumming’.

Therapist: ‘You didn’t like it. Why was that?’

Patient 1: ‘It was something . . . ’ [looks to therapist and sighs]

Therapist: ‘. . . something unpleasant?’

Patient 1: ‘Yeah’.

Later on in the same session (after improvisation with resonant instruments):

Patient 2: ‘This time it was noisy. Makes my eyes hurt’.

Therapist: ‘So which sound is not so good for you?’

Patient 2: [points to wind chimes and tone bar]

After making music, these patients expressed discomfort rather than referring directly to their traumatic memory. The therapist interpreted this discomfort as ‘something unpleasant’ which the patients confirmed. From session 7, patients described music therapy grounding dissociative states. In the penultimate session, one patient, who suffered a continual state of dissociation, commented that music enabled her:

‘To be yourself again. You feel like you’re **you** and not just somebody else walking around as if you’re up there watching down on you . . . ’

‘ . . . When I’m in this room and I’m playing, I feel **me** again . . . like I was before . . . before everything that happened. When I go out that door – out there – I feel as if I’m up there again in a cloud watching me’.

#### *Avoidance*

Avoidance took many forms from occasional non-attendance, leaving the room momentarily and non- or limited participation in music making. Instances of avoidant behaviour were observed to decrease over the course of therapy. For example, at the beginning of

therapy, one patient would excuse herself from the room to visit the toilet but gradually communicated her feeling state:

Session 1-‘My head hurts- I need to wash [my] face’.

Session 3-‘Feeling tired’.

Session 5-looks for words to describe sadness

Session 6-‘nothing feels right’.

This patient was able to remain in the room for longer as sessions progressed.

Patients commented on the wish to avoid feelings that would trigger a traumatic memory, although some later began to express value in tolerating and exploring such emotions. Patients spoke of using music to block out or get rid of evocative emotions, particularly anger and sadness. For example in session 3, one patient noted that the flute when by itself evoked sad feelings and memories, which he wished to avoid, but that these feelings were relieved when others joined in playing.

Therapist: ‘[name], you said you felt better when everyone joined in’.

Patient: ‘... the sadness is good shared. It gives you back memories that you don’t wanna have and it makes you feel depressed. So when other people join in it kind of evens out that it’s meeting the other so you don’t feel like that’.

### Hyperarousal

Arousal was indicated by instances of headaches and difficulties in tolerating sounds. Indicators decreased rapidly with no references to traumatic associations, or difficulties tolerating the music from session 7 onwards (Figure 2). Patients commented upon the ways in which musical instruments enabled them to express anger.

‘It helps to feel if you’re hitting something ... you release your anger through your arm into the music’.

‘Some of them [*the drums*] are really loud and you kind of..um..well..I was feeling these are my angry feelings and it sounds really loud. I was hitting with anger and getting rid of them listening ... I wanted to get rid of the anger so I felt more relaxed afterwards’.

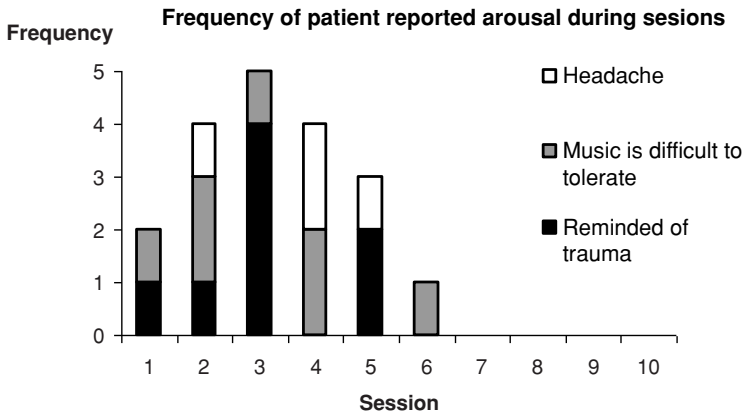


Figure 2. Patient reported traumatic associations and difficulties tolerating music during music therapy.

Towards the end of therapy, patients commented upon generalizing these experiences in their day-to-day life, particularly when on public transport.

‘Sometimes when I’ve left here, going back on the bus, I start tapping, playing, or start up on a table or something’.

#### *Positive experiences within sessions*

Relaxation and enjoyment occurred throughout therapy.

‘It [drumming improvisation] was fun’

‘... it was good – relaxing. The different pieces that we played, different tunes’.

‘I couldn’t concentrate... [pause]... but you [patient] played on this guitar and I was hearing- it was soothing’.

Difficult moments were often diffused with humour. In session 4, a patient played a high-pitched instrument causing another group member to hold her head and gesture, laughing, for her to stop.

Patient 1: ‘Sorry! I didn’t realise – sorry group.’ [group laughs]

Patient 2: [laughs] It’s like this sounding in your head “oww” [laughing].

The group became more cohesive in its music making. Patients initially played separately but gradually established a shared pulse and rhythms. Members played in pairs, and shared instruments giving thought to their instrument choice so that instruments would ‘fit in’, and minimize distress to others. Patients valued the normative and shared social experiences, commenting upon support experienced by playing and being with others.

‘... I felt like crying, but when other people join in, it uplifts me. So I loved that’.

‘It was very good because of the different tunes. At first it was like everyone was playing their own, then they all joined together and at the same time changing the tune or rhythm’.

‘Everybody knows what you’ve been through’.

Patients were frequently reminded of their pre-trauma self and ‘good memories’, often from within their own culture including church, family occasions, and school.

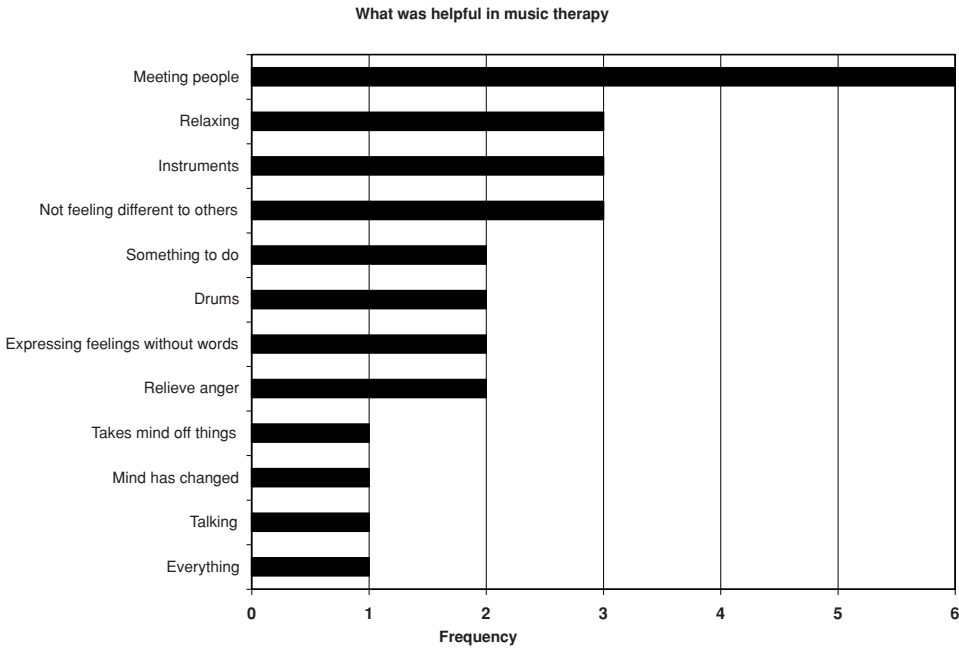
‘When I play this drum, it reminds me of when I’m back home at church. It’s very nice’

[smiling] ‘It’s in my country- the same [tambour]. Big ones, small ones. A lot of women play this at weddings, celebrations and sing songs’.

‘... in this group, I always think of the phrase “you played ‘em” [them]. Just like you wanted to play, like big wild beats of these good times which are like from your childhood. I like that’.

#### **Exit interviews**

The exit interviews asked what patients had found helpful and unhelpful, what had changed since attending, and what they would change about the group. As patients gave



**Figure 3.** Aspects of music therapy reported as helpful by patients.

more than one response, the total responses differ from the total number of patients interviewed ( $n = 8$ ).

*Helpful factors*

Patients valued the social opportunities offered by the group. Six cited ‘meeting people’, with three stating that knowledge of shared traumatic experiences had helped (Figure 3):

‘... it’s not only me who has problems’.

‘Meeting other people as well, that I think are in the same situation as me’.

‘I can socialise with these people and I’m not feeling different because I know some of us been through what I’m going through or more than what I’m going through, so I feel welcome’.

The musical instruments were cited by three patients as helpful. Two specifically named the drums:

‘I loved the drum. It takes my brain to other way’.

‘I’ve been quite angry lately and especially banging on the drum helped releasing my anger’.

The third valued the opportunities for different instruments to express different feelings:

‘Every instrument has its own music or every time I play a different instrument I get a different feeling’.

The opportunity for expression without words was valued by two members, whilst two felt that this had helped to relieve anger:

‘I think having the chance to express my feeling not using words, but just using music itself and just feeling it’.

‘The drums bring out whatever frustration and anger I’m feeling’.

Music therapy was also valued for providing occupation and distraction. Two felt that the group had given them ‘something to do’, whilst two indicated that music had positively affected their mind:

‘Takes my mind away’

‘My mind has changed’

Both these patients had limited English vocabulary, and had great difficulty in describing what these changes represented. However, both expressed that these changes were positive and helpful. One patient felt that ‘talking was good’, whilst another stated that ‘everything’ had been good.

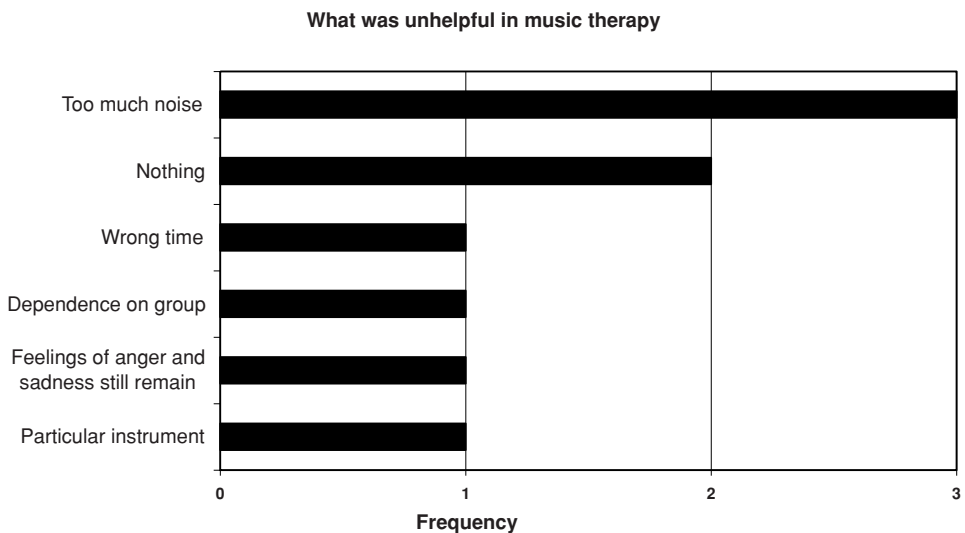
*Unhelpful factors*

Three cited difficulties with ‘noise’ or particular instruments (Figure 4).

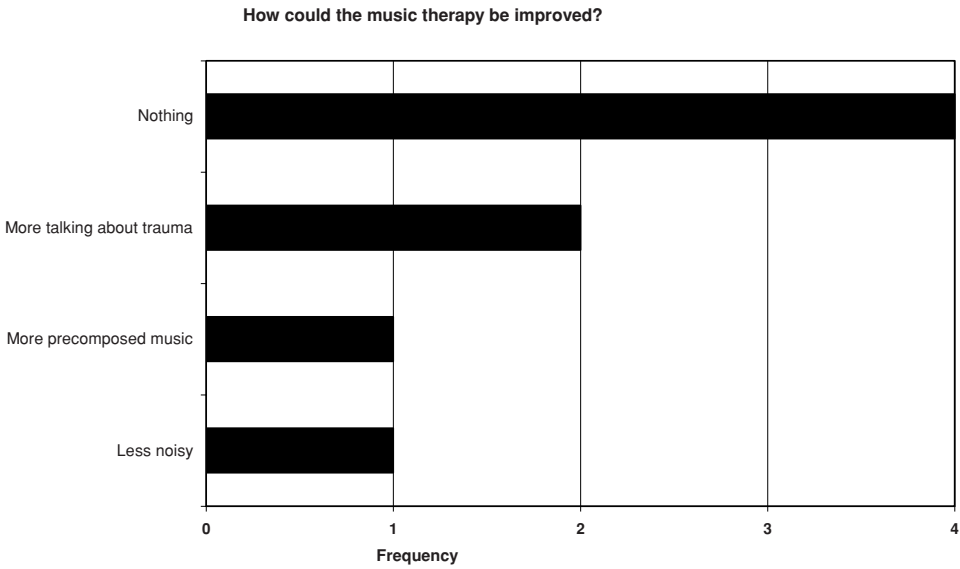
‘There was a particular instrument that makes a pinging noise . . . with that ping it gives me a headache and it makes me feel agitated’.

Two felt that there was nothing unhelpful about the group and two indicated that they were not ready for therapy to end. One expressed a fear of dependency on the group for support. Another felt that it was the wrong time for them. One stated that feelings of emptiness still remained but later noted that music therapy had provided a means to become calm when angry or upset:

‘It didn’t change my feelings basically, yeah my feelings are still the same . . . It gave me a technique to focus and to learn how to deal with my problems, but that’s it’.



**Figure 4.** Aspects of music therapy reported as unhelpful by patients.



**Figure 5.** Patient suggested changes to improve music therapy.

Later:

‘What has changed is that I’ve learned how to calm myself down. If I feel like really upset or really angry I get something and I focus on it . . . ’

*Factors patients would change*

Four stated that they would not change anything about the therapy (Figure 5). Three expressed a wish for the therapists and group to talk more openly about traumatic memories:

‘ . . . maybe people could talk more about their experiences and I would know I really relate to them’

‘More interaction. Much as everybody don’t want to talk about it at least . . . ’

One wished to listen to pre-composed classical music during therapy, and one suggested the group could be ‘less noisy’.

*Patient reported change*

A range of changes was reported (Figure 6). Only two patients felt that ‘nothing’ had changed. Four said they felt calmer and more at ease:

‘ . . . peaceful during and after’.

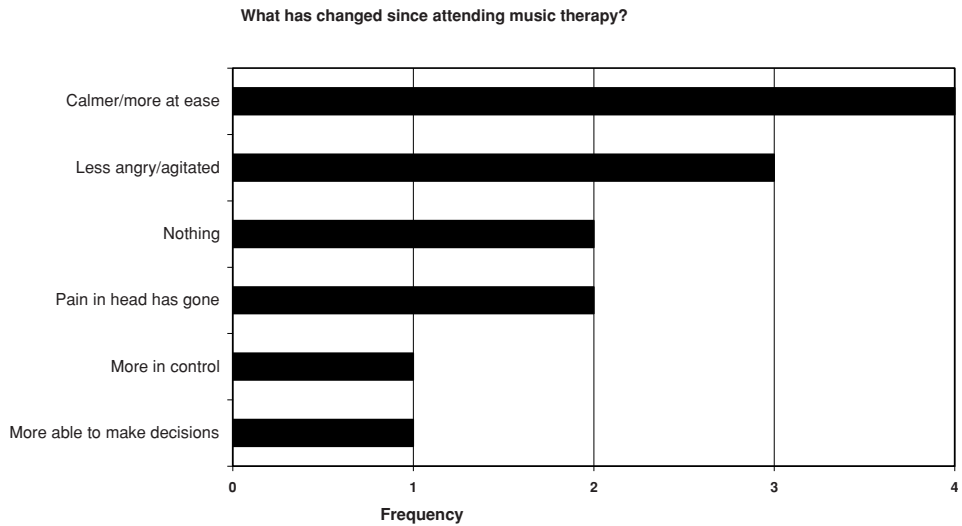
‘I seem to be calmer, more at ease’.

‘I’ve learned to calm myself down’.

‘I feel very at ease’.

Three associated this with a reduction and increased control over anger:





**Figure 6.** Patient reported changes since attending music therapy.

'If I really feel like really upset or really angry I get something and I focus on it . . . Especially when I'm in a situation when I really don't feel like speaking. I walk away now because it's not only me who has problems'.

'The drums bring out whatever frustration and anger I'm feeling'.

' . . . I don't feel so angry. I really don't. Whereas before I was angry all the time, frustrated, but now I take a lot of it out playing on the music'.

Two noted increased tolerance to difficult sounds:

'Too much music gave too much pain. But it goes. The pain in my head has gone'.

'I can listen to certain music and not feel agitated'.

One indicated a level of control over re-experiencing:

'I can think about here- not about the past'.

Whilst another reported a regained sense of autonomy:

'I feel very in control of my situation. I'm able to make decisions for myself'.

## Discussion

An exploratory randomized controlled trial of music therapy was conducted with a group of PTSD patients, who showed clinically significant symptom improvements across all three domains, particularly in avoidance.

Avoidance may have been most successfully addressed by fostering a safe therapeutic environment through grounding (Herman, 1997; Kennerly, 2009; Schauer, Neuner, & Elbert, 2005). Outcomes suggest music provided a means of arousal stimulation and regulation. Neuroimaging studies note disruption of 'affect arousal regulation',

in particular sensory-motor integration, physiological arousal regulation, and capacity for verbal communication in PTSD (Frewen & Lanius, 2006, p. 110; Van Der Kolk, 2006). It may be that re-experiencing is better addressed once avoidance and arousal are reduced through physical self-regulation (Hoch-Espada & Lippman, 2000; Van Der Kolk, 2006).

Depression symptoms (BDI-II) reduced in the treatment group, demonstrating a statistical trend approaching statistical significance. The mixed methods of data collection provide a rich account of music therapy not only as a tolerable and enjoyable personal experience, but also as a feasible and effective clinical intervention. Findings are consistent with other studies into music therapy for PTSD (Bensimon *et al.*, 2008; Orth *et al.*, 2006). Engagement, establishing trust, identification, and expression of emotion, and capacity to tolerate sound qualities of instruments emerged as important features, and will now be given further consideration.

### **Engagement with music therapy**

The first step in helping participants was through engagement with music therapy. Mean attendance was seven sessions. This figure is remarkably high for a clinical group who faced not only serious mental disorder but huge social and judicial stressors over the study duration. This engagement level supports suggestions that music be considered safe, enjoyable, and motivating (Gold *et al.*, 2009). It is reasonable to assume that this figure reflects rapid engagement with music therapy that, for one, was reported as the 'social event' of her week. Patients showed commitment even when unable to attend. This was an important and surprising outcome and an essential requisite for therapeutic gain from music therapy.

### **Establishment of safety and trust**

Patients initially expressed anxiety and fear about what was expected of them, but then moved to describing experiences of safety and calm. Patients were provided with activities that were non-demanding, controlled, boundaried, and explicit. Guidance and repetition of structured activities may have reduced initial fears and encouraged habituation to individual sounds. Grounding (Volkman, 1993) may have addressed avoidance symptoms. Patients spoke of music providing a point of focus and link to the present. Music is a stimulus that may be difficult to avoid when it is actively being produced. The distraction provided by this stimulus enabled an increased focus and attention upon making music in the present, enabling patients to associate and incorporate safer memories alongside traumatic memories (Van Der Kolk, 2006).

Music-making allowed social inclusion even for those who spoke less during the discussions. Patients moved from individual voices/sounds to relating to others musically and then interpersonally. The group discussions exemplify this change as patients commented first upon the value of musical and then later, overall group support as evidenced by the exit interviews.

In order to encourage socialization and group cohesion, it was emphasized that all shared traumatic experiences. Changes were reported by the clinical team in the behaviour of patients outside of the group: they began to befriend each other, communicate with, and travel together. The social opportunities afforded by the group were the most frequently cited helpful factor of music therapy. The therapeutic importance of social support is consistent with current developments in psychosocial support of traumatized communities (Davidson, 2010).

### **Identification and expression of emotion**

PTSD has a severe impact upon mood, exemplified by emotional ‘numbing’, extreme anger and irritability, and depression. Patients reported music therapy as a helpful means of emotional expression and regulation. Instruments and music eliciting strong emotional responses were quickly identified, which may have provided a means to control arousal (Frewen & Lanius, 2006; Van Der Kolk, 2006). These correlate with findings from previous studies (Bensimon *et al.*, 2008; Orth, 2001) and studies of music and emotion (Gabrielsson, 2001).

Bensimon *et al.* found drumming enabled emotional expression and a regained sense of control (2008, pp. 44–45). Within this study, patients reported physically tapping rhythms outside of therapy to recall the group’s music and self-regulate arousal. Tempo and rhythm impact arousal levels when listening to music (Bernardi, Porta, & Sleight, 2006; Husain, Thompson, & Schellenberg, 2002) and might serve to regulate emotional states (Bispham, 2006, p. 131). Physical recollection of rhythms might, therefore, be used proactively by patients to interrupt the fear response through self-regulation (Van Der Kolk, 2006).

### **Capacity to tolerate particular sound qualities of instruments**

Patients’ capacity to tolerate particular sound qualities of instruments appears to have played a key role in reducing PTSD symptoms. Certain instruments evoked traumatic memories eliciting emotional responses. These were high pitched, resonant, loud in volume or with a sharp attack. The immediacy of the music limited avoidance as patients had to learn to tolerate, communicate, and acknowledge the impact of their instrument upon other group members.

Bensimon *et al.* (2008) suggest that drumming provided a ‘non-intimidating’ means of habituation (p. 44). Patients within our study commented upon an increased ability to tolerate sounds that they had found difficult early on in therapy, suggesting habituation, which may have aided arousal reduction. Discussion enabled indirect acknowledgement of their shared traumatic experiences, facilitating processing of the traumatic memory. Where patients expressed conflicting preferences, they were encouraged to find solutions to ensure that each member could experience their preferred sounds. The focus of discussions upon immediate experiences, may have aided this self-awareness and self-regulation (Van Der Kolk, 2006). Negotiations necessitated group problem solving and this may have provided patients with confidence to generalize these experiences to other aspects of their lives.

### **Associated symptoms of depression**

The relationship between music therapy and the depression scores remains unclear. During treatment, patients increased their activity, reduced avoidance, and generated their own social supports. Group dynamics may have contributed, as shown in the qualitative outcomes. However, patients also reported music intrinsically altering their mood and extrinsically motivating them to continue treatment. Music enabled them to experience and share sad feelings. Indications are that music therapy impacts positively upon mood, but effectiveness in treating depression is unclear (Maratos, Gold, Wang, & Crawford, 2008). Future studies should distinguish the impact of group music therapy on mood as distinct from PTSD.

### **Limitations**

This exploratory study was completed with final data on 16 patients and it remains to be seen whether this level of success could be replicated. The two groups were similar on assessed baseline characteristics including the nature of the index trauma. Given the small sample size, however, stratification was not possible, resulting in a 9 years age difference between groups. However, despite the small sample and large variation of post-traumatic stress levels, a statistically significant effect size was found on the primary outcome indicating underlying potential for this intervention. A further shortcoming is that assessors were not masked regarding patient allocation.

Outcomes could have been achieved through a group effect rather than specifically music therapy. The therapist commitment, the unique organizational characteristics of the Conservatoire, and increased input may also have contributed to treatment effect. The dual role of the music therapists in the research design and analysis, may have similarly affected outcomes. Future research should disentangle specific and non-specific factors to clarify effectiveness utilizing independent researchers from outside the field of music therapy (Craig *et al.*, 2008).

Existing evidence-based treatments for PTSD (Bisson *et al.*, 2007; NICE, 2005) make no reference to non-responders. The study results suggest that group music therapy could be a realistic and effective intervention for such patients, but that access and engagement of patients will still be limited. Group music therapy may be seen as a useful alternative to trauma-focussed CBT, as the approach may be more tolerable and has a significant non-verbal component. Should further studies replicate these results, it may be possible to recommend music therapy as an alternative non-verbal treatment as has been seen with Schizophrenia guidelines (NICE, 2009; Talwar *et al.*, 2006).

### **Future research**

The findings of this study justify a larger pragmatic trial that should include follow-up assessments to test sustainability (Craig *et al.*, 2008; Gavrilovic, d'Ardenne, Bogic, Capuzzo, & Priebe, 2005) and whether symptom gains translate into improved social situation and quality of life (Priebe, Watzke, Hansson, & Burns, 2008).

Future research could investigate how specific elements of music contribute to grounding and self-regulation. Findings suggest that particular sounds elicit common responses in PTSD sufferers and indicate that particular techniques and approaches could be developed to address these features (Bensimon *et al.*, 2008; Orth, 2001).

Patients reported that they valued participating in a group with shared traumatic experiences. Current NICE guidelines note that few studies exist for group CBT interventions for PTSD and that there is no 'convincing evidence for its effectiveness, in contrast . . . [to] individual trauma-focused CBT' (NICE, 2005, p. 62). Results indicate that group interventions for PTSD are feasible. Future research should examine the contribution of group setting and non-verbal interventions to outcomes through comparison of individual and group music therapy. Use of music and musical engagement could be assessed by scales such as the Improvisation Assessment Profiles (Bruscia, 1987). Comparisons of group interventions would provide data regarding the contribution of music therapy to outcomes.

The study interventions had a strong emphasis upon active musical participation. However, the literature suggests receptive methods may be necessary when patients are acutely aroused (Orth, 2001, 2005; Orth *et al.*, 2006). Research to identify indications for active or receptive methods is, therefore, needed.

Therapy was shorter than that recommended for other target groups (Gold *et al.*, 2009), but given the difficulties faced by patients in attending, a longer course of therapy might not have been feasible. Future studies should test feasibility, effects, and acceptability of varying durations and frequencies of therapy. Three patients would have liked more discussion of traumatic experiences and it is interesting to note that four patients returned to CBT after music therapy. This should be taken into account in their clinical work and would be a further variable to be tested in future studies.

## Acknowledgements

Thanks to Graham Fawcett, Dr Naomi Wilson for her assistance, Dr Helen Odell-Miller for supervision, Dave Foister and Carl Sutton for audio-visual assistance, and the support staff at the Guildhall School of Music & Drama. In particular, we thank Professor Barry Ife, Principal of the Guildhall School of Music & Drama, and Dr Robert Dolan, Chief Executive of East London Foundation NHS Trust for their ongoing interest and support in this innovative project.

## References

- American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders*. (4th ed.). Washington, DC: Author.
- Amir, D. (1998). The use of Israeli folksongs in dealing with women's bereavement and loss in music therapy. In D. Dokter (Ed.), *Arts Therapists, Refugees and Migrants: Reaching Across Borders* (pp. 217-235). London: Jessica Kingsley Publishers.
- Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *Manual for Beck Depression Inventory-II*. San Antonio, TX: Psychological Corporation.
- Bensimon, M., Amir, D., & Wolf, Y. (2008). Drumming through trauma: Music therapy with post-traumatic soldiers. *The Arts in Psychotherapy*, 35, 34-48. doi:10.1016/j.aip.2007.09.002
- Bernardi, L., Porta, C., & Sleight, P. (2006). Cardiovascular, cerebrovascular, and respiratory changes induced by different types of music in musicians and non-musicians: The importance of silence. *Heart*, 92, 445-452. doi:10.1136/hrt.2005.064600
- Bispham, J. (2006). Rhythm in Music: What is it? Who has it? And Why? *Music perception. An Interdisciplinary Journal*, 24, 125-134. doi:MP.2006.24.2.125
- Bisson, J. I., Ehlers, A., Matthews, R., Pilling, S., Richards, D., & Turner S. (2007). Psychological treatments for chronic post-traumatic stress disorder: Systematic review and meta-analysis. *British Journal of Psychiatry*, 190, 97-104. doi:10.1192/bjp.bp.106.021402
- Blacking, J. (1973). *How Musical is Man? (The John Danz Lectures)*. Washington, DC: University of Washington Press.
- Blake, D. D., Weathers, F. W., Nagy, L. M., Kaloupek, D. G., Klauminzer, G., Charney, D. S., & Keane, T. M. (1990). A clinician rating scale for assessing current and lifetime PTSD: the CAPS-1. *The Behavior Therapist*, 13, 187-188.
- Breslau, N., Davis, C. G., Peterson, E. L., & Schultz, L. (1997). Psychiatric sequelae of posttraumatic stress disorder in women. *Archives in General Psychiatry*, 54, 81-87.
- Bruscia, K. E. (1987). *Improvisational models of music therapy*. Springfield, IL: Charles C. Thomas Publishers.
- Craig, P., Dieppe, P., Macintyre, S., Mitchie, S., Nazareth, I., & Petticrew, M. (2008). Developing and evaluating complex interventions: The new Medical Research Council guidance. *British Medical Journal*, 337, 979-983. doi:10.1136/bmj.a1655
- Creamer, M., Bell, R., & Failla, S. (2003). Psychometric properties of the Impact of Events Scale - Revised. *Behaviour Research and Therapy*, 41, 1489-1496. doi:10.1016/j.brat.2003.07.010
- d'Ardenne, P., Capuzzo, N., Ruaro, L., & Priebe, S. (2005). One size fits all? Cultural sensitivity in a psychological service for traumatised refugees. *Diversity in Health and Social Care*, 2, 29-36.

- Davidson, S. (2010). Psychosocial support within a global movement. *The Psychologist*, *23*, 304–307.
- Dixon, M. (2002). Music and human rights. In J. P. Sutton (Ed.), *Music, Music Therapy and Trauma: International Perspectives* (pp. 119–132). London: Jessica Kingsley Publishers.
- Frewen, P.A., & Lanius, R.A. (2006). Toward a psychobiology of posttraumatic self-dysregulation: Reexperiencing, hyperarousal, dissociation, and emotional numbing. *Annals of the New York Academy of Sciences*, *1071*, 110–124. doi:10.1196/annals.1364.010
- Gabrielsson, A. (2001). Emotions in strong experiences with music. In P. N. Juslin & J. A. Sloboda (Eds.), *Music and emotion: Theory and research* (pp. 431–449). Oxford: Oxford University Press.
- Gavrilovic, J. J., d'Ardenne, P., Bogic, M., Capuzzo, N., & Priebe, S. (2005). Survey of specialised UK traumatic stress services. *Psychiatric Bulletin*, *29*, 416–418. doi:10.1192/pb.29.11.416
- Gold, C., Solli, H. P., Krüger, V., & Lie, S. A. (2009). Dose-response relationship in music therapy for people with serious mental disorders: Systematic review and meta-analysis. *Clinical Psychology Review*, *29*, 193–207. doi:10.1016/j.cpr.2009.01.001
- Harvey, A. G., Bryant, R. A., & Tarrier, N. (2003). Cognitive behaviour therapy for posttraumatic stress disorder. *Clinical Psychology Review*, *23*, 501–522. doi:10.1016/S0272-7358(03)00035-7
- Heidenreich, V. (2005). Music Therapy in war-affected areas. *Intervention*, *3*, 129–134.
- Henderson, H. (1991). Improvised songs: Stories in the treatment of a thirteen-year old sexually abused girl from the Xhosa tribe in South Africa. In K. Bruscia (Ed.), *Case Studies in Music Therapy* (pp. 207–217). Phoenixville: Barcelona Publications.
- Herman, J. (1997). *Trauma and Recovery: The Aftermath of Violence*. New York: Basic Books.
- Hoch-Espada, A. L., & Lippmann, J. (2000). Integrating cognitive behavioural therapy into a psychodynamic framework. *Cognitive and Behavioral Practice*, *7*, 350–356. doi:10.1016/S1077-7229(00)80095-4
- Horowitz, M. J., Wilner, N., & Alvarez, W. (1979). Impact of Event Scale: A measure of subjective stress. *Psychosomatic Medicine*, *41*, 209–218.
- Hughes, T. (2000). *Leijla's secret: Trauma: Perpetrator and victim. Towards an identity through music*. Unpublished post-graduate diploma dissertation. Guildhall School of Music and Drama, London.
- Husain, G., Thompson, W. F., & Schellenberg, E. G. (2002). Effects of musical tempo and mode on arousal, mood, and spatial abilities. *Music Perception: An Interdisciplinary Journal*, *20*, 151–171. doi:10.1525/mp.2002.20.2.151
- Hussey, D. L., Reed, A. M., Layman, D. L., & Pasiali, V. (2008). Music therapy and complex trauma: A protocol for developing social reciprocity. *Residential Treatment for Children and Youth*, *24*, 111–129. doi:10.1080/08865710802147547
- Jakupcak, M., Roberts, L. J., Martell, C., Mulick, P., Michael, S., Reed, R., . . . Macfall, M. (2006). A pilot study of behavioral activation for veterans with posttraumatic stress disorder. *Journal of Traumatic Stress*, *19*, 387–391. doi:10.1002/jts.201250
- Jones, C., Baker, F., & Day, T. (2004). From healing rituals to music therapy: Bridging the cultural divide between therapist and young Sudanese refugees. *The Arts in Psychotherapy*, *31*, 89–100. doi:10.1016/j.aip.2004.02.002
- Kennerly, H. (2009). Cognitive therapy for post-traumatic dissociation. In N. Grey (Ed.), *A casebook of cognitive therapy for traumatic stress reactions* (pp. 93–110). Hove: Routledge.
- Kessler, R. C., Sonnega, A., Bromet, E., Hughes, M., & Nelson, C. B. (1995). Posttraumatic stress disorder in the National Comorbidity Survey. *Archives of General Psychiatry*, *52*, 1048–1060.
- Krout, R. E. (2007). Music listening to facilitate relaxation and promote wellness: Integrated aspects of our neurophysiological responses to music. *The Arts in Psychotherapy*, *34*, 134–141. doi:10.1016/j.aip.2006.11.001
- Lang, L., & McInerney, U. (2002). A music therapy service in a post-war environment. In J. P. Sutton (Ed.), *Music, music therapy and trauma: International perspectives* (pp. 153–174). London: Jessica Kingsley Publishers.

- Macintosh, H. B. (2003). Sounds of healing: Music in group work with survivors of sexual abuse. *The Arts in Psychotherapy*, 30, 17–23. doi:10.1016/S0197-4556(02)00229-0
- Malloch, S., & Trevarthen, C. (2009). *Communicative musicality: Exploring the basis of human companionship*. Oxford: Oxford University Press.
- Maratos A., Gold C., Wang X., & Crawford, M. (2008). Music therapy for depression. *Cochrane Database of Systematic Reviews*, 1. Art. No.: CD004517. doi:10.1002/14651858.CD004517.pub2
- National Institute for Health and Clinical Excellence (NICE). (2005). *Post traumatic stress disorder: The management of PTSD in adults and children in primary and secondary care*. London: Gaskell & The British Psychological Society.
- National Institute for Health and Clinical Excellence (NICE) (2009). *Schizophrenia: Core interventions in the treatment and management of schizophrenia in adults in primary and secondary care (update)*. London: National Institute for Clinical Excellence. Retrieved from <http://www.nice.org.uk/nicemedia/pdf/CG82FullGuideline.pdf>
- Odell-Miller, H. (2002). One man's journey and the importance of time: music therapy in an NHS day centre. In A. Davies & E. Richards (Eds.), *Music Therapy and Group Work: Sound Company* (pp. 63–76). London: Jessica Kingsley Publishers.
- Odell-Miller, H. (2007). *The practice of music therapy for adults with mental health problems: the relationship between diagnosis and clinical method*. Unpublished doctoral dissertation. Aalborg University, Aalborg, Denmark.
- Orth, J. (2001). Between abandoning and control: Structure, security and expression in music therapy with traumatized refugees in a psychiatric clinic. In M. Verwey (Ed.), *Trauma and empowerment* (pp. 189–197). Berlin: VWB, Verlag für Wissenschaft und Bildung.
- Orth, J. (2005). Music Therapy with traumatized refugees in a clinical setting. *Voices: A World Forum for Music Therapy*. Retrieved from <http://www.voices.no/mainissues/mi40005000182.html>
- Orth, J., Doorschodt, L., Verburt, J., & Drozdek, B. (2004). Sounds of trauma: An introduction to methodology in music therapy with traumatized refugees in clinical and outpatient settings. In J. P. Wilson & Drozdek, B. (Eds.), *Broken Spirits: The treatment of traumatized asylum seekers, refugees, war and torture victims* (pp. 443–480). New York: Brunner-Routledge.
- Orth, J., & Verburt, J. (1998) One step beyond: Music therapy with traumatised refugees in a psychiatric clinic. In D. Dokter (Ed.), *Arts therapists, refugees and migrants: Reaching across borders* (pp. 80–93). London: Jessica Kingsley Publications.
- Orth, J., Verburt, J., van Nieuwenhuijzen, N., & Wijzenbeek, G. (2006). Getraumatiseerde vluchtelingen en asielzoekers [Traumatized refugees and asylum seekers]. In H. Smeijsters (Ed.), *Handboek Muziektherapie: Evidence based practice voor de behandeling van psychische stoornissen, problemen en beperkingen* (2nd ed.) (pp. 360–384). The Netherlands: Bohn Stafleu von Loghum.
- Pavlicevic, M. (1997). *Music therapy in context: Music, meaning and relationship*. London: Jessica Kingsley Publishers.
- Pavlicevic, M. (2002). Fragile rhythms and uncertain listenings: Perspectives from music therapy with South African children. In J. P. Sutton (Ed.), *Music, music therapy and trauma: International perspectives* (pp. 97–118). London: Jessica Kingsley Publishers.
- Priebe, S., Watzke, S., Hansson, L., & Burns, T. (2008). Objective social outcomes index (SIX): A method to summarise objective indicators of social outcomes in mental health care *Acta Psychiatrica Scandinavica*, 118, 57–63. doi:10.1111/j.1600-0447.2008.01217.x
- Read-Johnson, D. (2009). Commentary: Examining underlying paradigms in the creative arts therapies of trauma. *The Arts in Psychotherapy*, 36, 114–120. doi:10.1016/j.aip.2009.01.011
- Robarts, J. (2006). Music therapy with sexually abused children. *Clinical Child Psychology and Psychiatry*, 11, 249–269. doi:10.1097/00131746-200403000-00005
- Robarts, J. (2009). Supporting the development of mindfulness and meaning: Clinical pathways in music therapy with a sexually abused child. In S. Malloch & C. Trevarthen (Eds.),

- Communicative musicality: Exploring the basis of human companionship* (pp. 377–400). Oxford: Oxford University Press.
- Robertson, M. F., Humphreys, L., & Ray, R. (2004). Psychological treatments for posttraumatic stress disorder: Recommendations for the clinician based on a review of the literature. *Journal of Psychiatric Practice, 10*, 106–118.
- Schauer, M., Neuner, F., & Elbert, T. (2005). *Narrative exposure therapy: A short-term intervention for traumatic stress disorders after war, terror, or torture*. Gottingen: Hogrefe & Huber.
- Spinazzola, J., Blaustein, M., & van der Kolk, B. A. (2005). Posttraumatic stress disorder treatment outcome research: The study of unrepresentative samples? *Journal of Traumatic Stress, 18*, 425–436. doi:10.1002/jts.20050
- Strehlow, G. (2009). The use of music therapy in treating sexually abused children. *Nordic Journal of Music Therapy, 18*, 167–183. doi:10.1080/08098130903062397
- Steer, R. A., Ball, R., Ranieri, W. F., & Beck, A. T. (1999). Dimensions of the Beck Depression Inventory-II in clinically depressed outpatients. *Journal of Clinical Psychology, 55*, 117–128. doi:10.1002/(SICI)1097-4679(199901)55:1<117::AID-JCLP12>3.0.CO;2-A
- Sutton, J. P. (2002). *Music, music therapy and trauma: International perspectives*. London: Jessica Kingsley Publishers.
- Swallow, M. (2002). Neurology: The brain – its music and its emotion: The neurology of trauma. In J. P. Sutton (Ed.), *Music, music therapy and trauma: International perspectives* (pp. 41–43). London: Jessica Kingsley Publishers.
- Talwar, N., Crawford, M. J., Maratos, A., Nur, U., McDermott, O., & Procter, S. (2006). Music Therapy for in-patients with schizophrenia: Exploratory randomised controlled trial. *British Journal of Psychiatry, 189*, 405–409. doi:10.1192/bjp.bp.105.015073
- Towse, E. (1997). Group analysis and improvisation: A musical perspective. *British Journal of Music Therapy, 11*, 51–55.
- Tyler, H. M. (2002). In the music prison – the story of Pablo. In J. P. Sutton (Ed.), *Music, music therapy and Trauma: International Perspectives* (pp. 175–192). London: Jessica Kingsley Publishers.
- Van Der Kolk, B. A. (2006). Clinical implications of neuroscience research in PTSD. *Annals of the New York Academy of Sciences, 1071*, 277–293. doi:10.1196/annals.1364.022
- Volkman, S. (1993). Music therapy and the treatment of trauma-induced dissociative disorders. *The Arts in Psychotherapy, 20*, 243–251. doi:10.1016/0197-4556(93)90019-X
- Weiss, D. S., & Marmar, C. R. (1996). The Impact of Event Scale – Revised. In J. P. Wilson, & T. M. Keane (Eds.), *Assessing psychological trauma and PTSD* (pp. 399–411). New York: Guilford Press.
- Wigram, T. (2004). *Improvisation: Methods and techniques for music therapy clinician, educators and students*. London: Jessica Kingsley Publishers.
- Wild, J., & Gur, R. C. (2008). Verbal memory and treatment response in post-traumatic stress disorder. *British Journal of Psychiatry, 193*, 254–255. doi:10.1192/bjp.bp.107.045922