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Evaluation of a systematic development process: Relaxing music for the emergency department

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Abstract

A process evaluation was applied to the development and implementation of a receptive music therapy tool, with a view to promoting evidence-based practice via clear linkage from theory to practice. This music tool was required for a research project in the noisy emergency department (ED) of a large urban hospital. The process evaluation focuses on questions about the suitability, planning, application, and effectiveness of this tool used within the research project protocol. The music tool intervention was applied to fifteen selected patients who received a choice of four genre-based relaxation playlists (GRP) over a two-hour period via headphones and MP3 players. The process evaluation method utilized data sources including key informant interactive interviews, observational data, reflective practices, patient feedback and an independent music review. Responses from patients (aged 23-91 years) indicated that most patients listened to multiple genres and most patients (n=14) indicated that the music made them feel better, thereby indicating suitability and effectiveness. Independent music reviewers confirmed that the music playlists contained relaxing musical elements, based on established music therapy criteria. This project was innovative in clearly documenting a music tool development process (GRP) and in turn applying a process evaluation to systematically review both the development and implementation of the tool. In doing so, linkage from theory to practice was established, contributing to understandings about music for relaxation in healthcare.

Keywords: process evaluation, emergency care, relaxation, receptive music therapy, general hospital

Introduction

In order to achieve evidence-based practice, clear links between theoretical constructs and the clinical setting are essential. Process evaluation seeks to examine the development and application of something new, and can be applied to music therapy interventions. According to available literature, the development of a music tool, such as for receptive music therapy, has

rarely been subjected to a process evaluation. One exception is the review process evidenced informally in the work of Helen Bonny. Bonny reports analysing and implementing a receptive tool with multiple levels of decision-making and trialing in the development process (Bonny, 1978, 1989) for depth-oriented psychotherapy. In the broader health care field, process evaluations include a clear detailing of the development of the intervention tool (Davis et al., 2002), where links between the intervention and the process evaluation form part of an integrated cycle.

This methodological paper focuses on a process evaluation of a receptive music tool that was developed for the second part of a specific healthcare research project (*Sound and Silence in the Emergency Department*, SSED; Short, Holdgate, & Cox, 2006). This study piloted the use of individual music for relaxation for patients in order to overcome noise stress. The development of a tool incorporating several relevant music playlists was needed, however clear links between theoretical knowledge about relaxing music and practical application of such music in a clinical research context were not apparent. This paper seeks to outline a clear and transparent process of music selection for the genre-based relaxation playlists (GRP) generated for this project. This was based on relevant factors and pragmatic considerations, in line with current knowledge in music therapy and clinical care related to the Emergency Department (ED) situation. The process evaluation focuses on reviewing the decision-making process, methodological issues, the developmental process and information gained from implementation of this music tool applied in the context of research.

Process Evaluation

A process evaluation uses empirical, systematic data to assess and reflect on the delivery of a new initiative (Steckler & Linnan, 2002). As Weiss notes,

Although outcomes were the original evaluative focus, evaluation questions now deal not only with outcomes but with the process of the program, too – what is going on. Evaluators need to study what the program actually *does*. In the early days they took for granted that the program was doing what its operators said it was doing. But they soon learned that the assumption was often ill founded (Weiss, 1998, p.9).

Process evaluation is typically performed in the clinical situation where a new program, protocol or intervention is implemented, in order to determine a) whether the new intervention was performed as planned, b) whether or not this intervention is feasible in normal practice, and c) whether improvements of the intervention are needed to facilitate implementation in the future (Geraets et al., 2006). Linnan and Steckler (2002) provide a clear framework for undertaking a process evaluation, incorporating concepts such

as context, reach, dose delivered, dose received, fidelity, implementation and recruitment. Typically, a process evaluation may incorporate both qualitative and quantitative analyses into a mixed method evaluation based on multiple data sources. Process evaluations have been applied to a range of acute clinical settings, including the emergency department (Loughlin, Spinola, Stewart, Farnslow, & Norton, 2000). They have been applied to research (such as a randomized controlled trial; Zilstra, van Haastregt, van Eijk, & Kempen, 2005) in order to avoid a Type III error, that is, “evaluating a program that has not been adequately implemented” (Basch, Sliepcevich, Gold, Duncan, & Kolbe, 1985, p.316). The importance of linking theory to intervention development is also noted (Weiss, 1998).

Decision-Making in Music Choices

According to the literature, music for stress studies is often treated as a “black box” where arbitrary choices are made with no apparent decision-making process, for example, the unexplained use of two Mozart selections to constitute the relaxation arm of a clinical drug trial (Flaten, Asli, & Simonsen, 2006). Even in an ostensibly music therapy research project where the music choice/composer was clearly noted, no rationale was given for why it was selected other than the statement that the tracks “incorporate properties of music conducive to relaxation, and meet criteria for sedative music” (Mandel, Hanser, Secic, & Davis, 2007, p. 182). Another study noted a blend of “reason and emotion with total sureness and solidity” as their rationale for choosing the music of J.S. Bach for a research project, however no further information was given about the specific choice of the *Magnificat* (le Roux, Bouic, & Bester, 2007). Providing a rationale and decision-making process for the development of relaxing music choices is essential for good clinical practice and for solidly based research.

Characteristics of relaxing music

Basic tenets of professional music therapy include an awareness of general characteristics thought to be essential for music to be relaxing or sedative (Davis, Gfeller, & Thaut, 1999; Radocy & Boyle, 2003). Grocke and Wigram have detailed musical and stylistic characteristics associated with relaxing music across several genres (Grocke & Wigram, 2007). Krout (2007) summarizes the musical elements perceived by many listeners as relaxing as:

slow and stable tempo (pace or speed), low volume level and soft dynamics, consistent texture (combination of sounds and instruments), absence of percussive and accented rhythms, gentle timbre (sound or tone colour), legato (connected) melodies, and simple harmonic or chord progressions (Krout, 2007, p.138).

The length of music and a careful selection process is important for both general music therapy and The Bonny Method of Guided Imagery and Music (BMGIM), the latter of which relies entirely on recorded music and a fundamental understanding of the relaxation process. Krout suggests that music for relaxation should be at least 20-30 minutes long and with smooth transitions (Krout, 2007). Bonny suggests the need for careful attention to timing of silence between tracks, and for careful consideration of matching key changes, instrumentation and stylistic characteristics in order to ensure a smooth transition for the clients as they listen to the music (Abrams, 2002; Bonny, 1989). Lyrics may be considered distracting, emotional, and arousing (Grocke, 2002; Grocke & Wigram, 2007; Krout, 2007). There also needs to be sufficient variation such that the music does not become too repetitive or tedious with repeated listening (Krout, 2007). The selection of effective music for relaxation may additionally be influenced by clinical needs related to physical disability and/or aged care (Short, 1992a, 1992b, 2007).

Individual responses

Variability in each person's responses is a factor in the impact of music used for relaxation (Staum & Brotons, 2000). Most effective results in promoting relaxation arise from studies which are both individualized and involve elements of personal choice (Hanser, 1988; MacDonald et al., 1999), thus addressing issues of taste and preference. The age of participants has rarely been addressed in relaxation studies with a few exceptions (Clair, 1996; Short, 2007). Likewise, there has been little written about the impact of ethnicity and culture on music for relaxation and imagery (Good et al., 2000; Short, 2005-6). The current emotional state of the participants impacts on their ability to relax. In view of this, the isoprinciple of matching music to mood is needed (Altshuler, 1948, Davis, 2003; Krout, 2007; Short, 1992c) in order to engage the client and provide maximum benefits. Curiously, a study comparing the effects of four musical genres on tension, mood and mental clarity in a non-clinical setting showed no apparent attempt to take into account individual responses and preferences: New Age and grunge rock music tracks were chosen explicitly based on sales reported in a music magazine (McCraty, Barrios-Choplin, Atkinson, & Tomasino, 1998). Clearly there needs to be further consideration of individual responses in relation to the choosing of music for relaxation in the context of research.

Relaxing music in medical settings

The operationalization of relaxing music to the medical situation for a purpose such as the current SSED research project has rarely been addressed in existing music therapy or healthcare literature. Little information was found on the use of music for relaxation in a medical setting when it was not

an overtly individualized music therapy context. A study using music to reduce stress during colonoscopy provided patients with a selection of music (classical, jazz, pop, rock and easy listening) and subjects were simply asked to “select the type of music that would normally relax them” (Smolen, Topp, & Singer, 2002, p.129). A randomized, controlled study of pre-operative anxiety merely reported that “the type of music administered was selected by the patient” (Wang, Kulkarni, Dolev, & Kain, 2002, p. 1490). In contrast, Spintge notes that “it is the situation and the patient’s preferences which have to be considered”, and “genres tell nothing about therapeutic capacities of any piece of music” (R. Spintge, personal communication, 21 January, 2008).

The need for patients to have control in selecting the music to use for their relaxation experience is important (Krout, 2007), but few indications exist of how this may be applied in an acute medical setting. The provision of music choices for patients in anaesthesia in a sports hospital setting in Germany has been noted by Spintge, where music choices based on a patient questionnaire have led to a selection of 6-10 different categories meeting 95% of patient requests (R. Spintge, personal communication, 21 January, 2008). A recent study successfully using music to address physiological and psychological reactions to pain during cardiac procedures in the intensive care unit offered patients three choices of music, described as “slow rhythmic songs, Chinese slow rhythmic, and Western slow rhythmic music” (Chan et al., 2006, p. 672).

No studies were located which looked at the application of music for relaxation in the context of the emergency department. Therefore, the purpose of this article was to outline an initial decision-making process involved in the development of a music tool and then perform a process evaluation in order to review both development and implementation of this tool in the context of the SSED research project. In doing so, associated questions were:

- 1) Was it possible to find a limited number of musical genres suitable to the ED context?
- 2) Could the development of such GRPs relate to patients and their needs in the ED context?
- 3) Could this intervention be implemented as planned, in the ED context?
- 4) Did the patients recruited fit the expected ED profile (on which music planning was based)?
- 5) Were patients able to listen to the music in the ED, and what were their GRP choices?
- 6) What feedback did patients give about the GRPs within the SSED project?
- 7) Was it possible to determine if such GRPs were in fact acceptable, effective and appropriate?
- 8) Were there any suggestions for improvement with a view to future implementation?

Methodology

The complex methodology of this paper occurs in two phases. Phase 1 outlines the developmental process by which the music tool (GRPs) was devised and applied. Phase 2 applies a process evaluation to review this process of development and implementation.

Phase 1: Development of the music tool

The systematic development of the music tool required for the SSED research project (Short et al., 2006) comprised data sources derived from existing literature and key informant interactive interviews with relevant stakeholders (music industry, ED staff, music therapists, community organizations) in conjunction with practice knowledge and experience of the researcher as a longstanding music therapist. The staged developmental process is depicted schematically in Figure 1.

Stage 1: Purpose

The pre-existing funded research SSED protocol (Short et al., 2006) required the use of recorded receptive music to be delivered individually via headphones to participating patients in the ED who met the inclusion and exclusion criteria and who were randomized to the music condition of the pilot study. Inclusion and exclusion criteria required that patients did not have major mental illness and had a Glasgow Coma Scale (GCS, Teasdale & Jennett, 1974) of 15, indicating that the person was within the range of normal consciousness. They were required to be English-speaking or one of the four targeted language groups (Vietnamese, Arabic, Chinese-Cantonese & Mandarin, Spanish). Patients were recruited following their ED medical consultation, and children were not included. All patients completed validated assessment tools such as the Positive and Negative Affect Schedule (PANAS, Watson, Clark, & Tellegen, 1988) and the noise disturbance scale Disturbance Due to Hospital Noise Scale (DDHNS, Topf, 1985) as part of the SSED project.

Stage 2: Information literature

A systematic literature review was undertaken, focusing on recorded music choices for relaxation as relevant to the acute care or hospital setting. Literature was sourced from major internet databases (Medline, Cinahl, Embase, Psychinfo) using keywords such as 'music', 'music therapy', 'listening', 'emergency services', 'critical care', 'acute care', 'general hospital', 'relaxation', 'stress' and 'research'. Results were limited to English-language articles. Literature identified was examined for further

relevant sources. Contacts with selected music therapists and relevant researchers were pursued with a view to deriving further information.

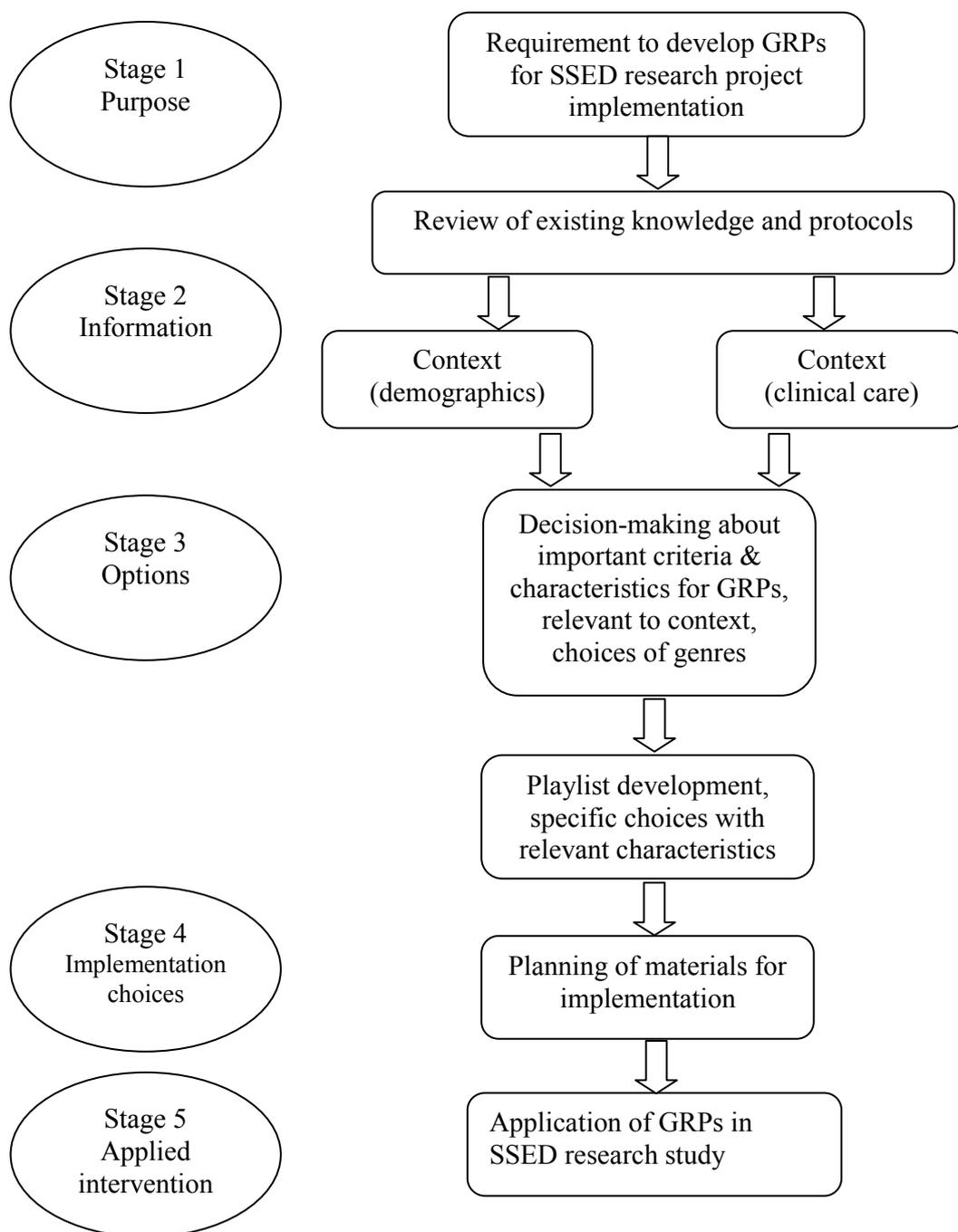


Figure 1. Music tool developmental process for the SSED research project (Short, Holdgate, & Cox, 2006).

Context

The SSED project occurred in a busy emergency department of a 650-bed tertiary teaching hospital in outer urban Sydney, handling approximately 180 presentations per day. Of these, typically 2/3 spent 4 hours in the ED

before being discharged home and 1/3 typically spent 9 hours in the ED before being admitted to hospital. Common presentations in the ED were for problems such as chest pain, shortness of breath, lacerations, pain and severe trauma.

This hospital served a diverse local community which was skewed towards younger rather than older age groups, where there was a large proportion of people born overseas (37.8%) and from a non-English speaking backgrounds (33.6%), and the dominant non-English language spoken at home was Arabic (7.7%), with other dominant languages being Vietnamese, Chinese, Hindi and Serbian and all major religions being represented (Liverpool City Council Community Profile, based on most recent available census data). The local government area was among the top five local government areas of disadvantage in Sydney, according to the SEIFA index of disadvantage (Liverpool City Council Community Profile, based on most recent available census data).

A review of 14,369 ED admissions over a three-month period showed that 76% were 20 years and over. The largest groups were 20-34 years (31%), 35-49 years (25%) and 65 years and over (25%). A further 15-month review found that the non-English language groups most frequently presenting were Vietnamese, Arabic, Chinese, Italian, Serbian and Spanish.

The emergency department is by nature a noisy environment (Tijunelis, Fitzsullivan, & Henderson, 2005). Recent measures across six locations within current ED showed that 24-hour sound levels varied between 64 and 56 dB (Short, Short, Holdgate, Ahern, & Morris, 2008). Noise levels consistently exceeded the WHO noise standards (WHO, 2001), potentially causing clinical impact on communication, stress levels, aggressive behaviour, sleeping and hearing deficits. Noises disturbing patients in this ED comprised such sounds as overhead announcements, alarms on monitors, talking by staff and relatives, doors opening and closing, and sounds of patient distress (Short et al., 2008).

Stage 3: Options

The decision-making process regarding the receptive music tool for the SSED project was determined via an iterative process which combined knowledge and practice experience with key informant interactive interviews. Selecting music for implementation in such a setting additionally required attention to issues of taste and preference, with patients offered choice. Factors such as age and ethnicity offered clues about choices to be offered.

Musical characteristics important for relaxation in the ED clinical setting were identified. The music needed to be:

- 1) not too contrasting in loudness, since this could give the patient a surprise/shock if the person was on certain medications or feeling very unwell, including breathing and cardiac problems

- 2) fairly consistent within its style, as the patient was likely to be switching the music on and off due to medical treatment needs and interruptions
- 3) not too demanding or emotionally stimulating, since people in the ED were often in an emotionally vulnerable state due to unexpected health crises
- 4) of generalized appeal and with minimal direct associations, thus limiting specific songs that might have strong reactions (positive and negative)
- 5) free of inappropriate views, such as violence or racism, due to the wide range of cultural, religious & socioeconomic perspectives in this diverse local community

Consultation & music development process

For pragmatic reasons, it was initially proposed that 4-6 musical genres would be acceptable in order to address issues of choice. It was anticipated that they would fall within these general styles: 1) classical, 2) ambient, 3) world music, 4) jazz, 5) country, and 6) modern. During the iterative process of discussion and information-gathering, a range of music professionals both nationally and internationally were consulted about the different musical genres under consideration. For example, a key informant suggested that based on music listening demographics for Sydney, “country” music was not essential to our playlists. Another key informant identified certain ambient music which had already been composed and tested for use in critical care areas of the hospital environment in Denmark (Thorgaard, Ertmann, Hansen, Nørregaard, & Spanggaard, 2005). In selecting a “modern” playlist, both music educators and people from a younger age group were key informants offering suggestions and feedback during the development process. Since two of the music genre playlists ultimately selected were additionally described as having a “jazz influence”, it was seen as unnecessary to incorporate a further jazz genre playlist. In view of this, the final musical genre choices for playlists were: 1) classical, 2) ambient, 3) world and 4) modern music.

Issues of culture were carefully considered in developing music choices, since four non-English language groups were included in the SSED project (Chinese, Arabic, Vietnamese, Spanish). There was no capacity to undertake an extensive consultation process with cultural representatives. Therefore, the chief investigator/music therapist relied on her own cultural competence (see Short, 2005-6, for an explanation of this term) and that of key informants in the music selection process. Analysis of the ambient music indicated frequent usage of pentatonic scales and the overall impression appeared to be suitable for addressing Asian musical interests in a general sense. World music was deliberately selected to include Eastern European and Turkish influences which were likely to be acceptable to Arabic and Spanish listeners due to musical motifs, harmonic progression and timbres. Tibetan bell music was suggested by one key informant but was rejected after

listening/analysis, since many musical elements were not sufficiently acceptable to the general population and to the noisy ED context.

Playlist development

In developing playlists within the four chosen genres, careful attention was paid to musical congruence between tracks such as key changes and order of selections. Some vocal music was used, especially in the “modern” playlist. Issues of popularity and the likelihood of strong associations were considered and minimized where possible. Selections were rejected if they appeared to be depressing, too stimulating or inappropriate/offensive with regard to race and ethnicity. It was noted that younger people commonly appeared to relax with more active rhythmic music. Since the chief investigator was most familiar with classical music for relaxation, a consultation process was involved for stylistic choices in other genres. Each playlist was devised to be a minimum of 30 minutes in length, which could then be repeated as necessary, and are briefly described:

- 1) *Classical music* (total: 73:03 minutes). These instrumental-only selections comprised mainly orchestral or larger groups of instruments with wide tessitura. Composers included Gluck, Massenet, Mozart, Respighi, Faure, Chabrier, Pachelbel, Bach, Albinoni, Granados, Respighi, Hoffstetter, Tchaikovsky, and Vaughan Williams.
- 2) *Ambient music* (total: 65:25 minutes). Promoted by Music Humana, this album entitled “Waves” was composed by Niels Eje for hospital usage. It is described as “a relaxing voyage through worlds inspired by water in motion” (MusiCure, n.d.) which incorporates natural water atmospheres from Denmark, Sweden, and the Atlantic island of La Gomera and the Seychelles with traditional western instrumentation and some jazz influence.
- 3) *World Music* (total: 30:11 minutes). An integrated blend of multicultural music combining idioms from eastern Mediterranean folk and jazz. It includes musical influences from Turkey, Bulgaria and Hungary in a range of forms such as traditional sephardic and a newly composed Italian poem setting using a small ensemble which includes some vocal lines.
- 4) *Modern music*. (total: 30:43 minutes). Vocal selections by performers such as Ben Harper, Katie Melua, Jack Johnson & Xavier Rudd.

Stage 4: Implementation choices

Implementation planning for the SSED project occurred. Since the protocol demanded that music be applied individually and via headphones in the busy and noisy ED environment, an MP3 player which was small, light and easily transportable was sourced. It was also required to have no capacity for photos, which could form a potential privacy issue. The particular MP3 player selected (“JPlayer”) was selected for ease of use, given that patients

may be elderly, have reduced fine motor skills, and were typically not in a state to learn a set of new and complicated instructions. The brightly coloured (red) player was also not easily misplaced or stolen. Infection control issues were discussed with senior clinical staff (key informants). Each MP3 player was placed in a small clear press-seal plastic bag, and disposable over-ear rather than in-ear headphones were used (note that Krout, 2007, suggests that over-ear headphones also keep out unwanted noises).

To avoid associated preconceptions due to language, a careful description was developed to introduce each GRP genre. These were 1) Selected restful music from the “classical” tradition, 2) Music reflects the tranquil sounds of nature using western instruments, 3) An inviting and varied selection from the “world music” tradition, 4) Appealing and energizing popular music.

Explicit permission for use of the music in this study was sought and given by all parties involved. Ethical permission was receiving for the entire SSED study from the Area Health Human Research Ethics Committee. All participants were fully informed and free to withdraw without consequence. Arms-length recruitment and intervention was achieved via a dedicated research assistant for this project. Non-English speaking participants from the four targeted language groups received NAATI-accredited translated information and consent forms in their own language and planning occurred such that trained bilingual workers were available to assist patients with understanding and completion of all study documentation.

Stage 5: Applied intervention

Patients were recruited to the pilot research study according to the SSED protocol (Short et al., 2006), which included information, consent, randomization and completing of relevant paperwork for the study. Patients randomized to the intervention were given a choice of music and briefly listened to each genre before they commenced the study. Patients were initially assisted with using the MP3 player to achieve loudness control and switching between music programs. The study research assistant routinely checked back with them (15 minutes, 60 minutes) to ensure that any difficulties with using the equipment were resolved. The music intervention phase lasted for two hours.

Phase 2: Process Evaluation

This project used a clear framework for undertaking a process evaluation, as put forward by Linnan and Steckler (2002). This framework incorporated components such as context, reach, dose delivered, dose received, fidelity, implementation and recruitment. Data for such an evaluation included empirical data of patient recruitment, patient responses, observational data, reflective practices and an additional independent music

review. For example, in the SSED planning phase a research assistant checklist was devised, including checking-in that participants were managing to use the MP3 player. As they completed the study, patients were asked brief exit questions about their experience of the music. They were asked to rank the type of music they enjoyed listening to the most while in the ED. They were also asked if they had visitors while in the ED, and if so how often (5-point scale: Rarely, Sometimes, Often, Constantly, Unsure). Participants were asked about the frequency of interruptions while listening to the music (5-point scale: Rarely, Sometimes, Often, Constantly, Unsure), and which things stopped them from listening to the music (e.g. Family/friends, Medical staff, Didn't like the music, Couldn't relax, Pain, Medical Treatment). They were asked if the music made a difference to how they felt in the ED, and if so to what extent it made them feel better or worse (indicated on a visual analogue scale, VAS). An additional independent post-study assessment of the musical characteristics of the GRPs by tertiary music students used a newly devised questionnaire, the Analysis of Musical Parameters for Relaxation-Pilot (AMPR-P). This 13-parameter questionnaire was based on Krout's (2007) criteria and several additional questions relevant to the current study (see Appendix 1).

Results

Context

Within the context of the SSED project, 15 patients were recruited to receive the receptive music tool intervention. These patients collectively presented with problems including pain, heart problems, chest pain, breathing difficulties, suspected stroke, spiderbite and collapse. They were most frequently triaged as category 3 (n=8) or category 2 (n=6) (see Glossary for information about the Australasian Triage Scale). Four of the participants remained in the ED for more than 24 hours, and with the exception of these four, typical length of stay in the ED for music participants was just over 8 hours. Participants comprised 12 males and 3 females, aged 23-91 years. Only one patient in the entire SSED project was recruited from a non-English speaking background (Vietnamese), however he did not receive the receptive music tool intervention. Further information about the design of the broader SSED study is available elsewhere (Short, Ahern, Holdgate, Morris, & Sidhu, 2008).

Reach

Unlike a broad program implementation, this pilot study was limited in reach due to external factors based on the SSED protocol, particularly the small numbers possible due to limited resources. Recruitment was open to any patient meeting the inclusion and exclusion criteria during the

implementation of the project, which occurred during predetermined time periods over a three-month time period.

Dose delivered

Dose delivered is defined as the “amount or proportion of the intended intervention that is actually delivered to program participants” (Linnan & Steckler, 2002, p.13), incorporating materials and engagement with the audience directly related to program implementation. Relevant musical characteristics necessary for development of the receptive music tool were determined via insights gained from theoretical constructs (literature), discussions, reflection and consultations based on key informant and clinical knowledge. These included age, ethnicity, and clinical presentation, within the context of personal choice, taste and preference. All these factors were then combined and distilled in the context of four genres via an iterative process. Clinical knowledge from previous music therapy experience was added to the reflective development process.

In order to further evaluate the dose delivered, a post-implementation independent review of the musical characteristics present in the GRPs used the AMPR-P. This showed variation in the characteristics of each of the playlists, with classical and ambient music being slower, softer in dynamics, more consistent in texture, less percussive and rhythmic, having a gentle timbre, legato melody, and with smooth transitions between tracks. The world music had more use of pentatonic motifs compared to other playlists, and both world and modern music showed elements of increased rhythm and jazz. All playlists showed no inappropriate cultural views, however assessments of chord progressions and emotional impact showed a mixed response. Independent descriptions of the music are shown in Table 1.

Table 1

Independent Descriptions of the Music (GRP) by Independent Assessors

<i>(1) Classical</i>	<i>(2) Ambient</i>	<i>(3) World</i>	<i>(4) Modern</i>
Very relaxing soothing conducive to sleep. This music puts me in my own little world and lets me just switch off I find this style of music very easy to listen to and relax/unwind to.	I found it rather tedious. Water sounds made me uncomfortable! The music is soothing and neutral in the sense that no techniques introduced force a reaction from the listener – rather enables them to interpret in ways respective/relevant to them.	Not as soothing as (1) and (2) This music in my opinion is special interest music. I can happily enjoy in concert-like or solitary relaxation. The music develops mental images which would be distracting to me in other situations.	Music more upbeat than some of the classical and nature playlists; better for if I wanted to be awake but still calm – more alert. The music almost forces the listener to get involved by tapping or dancing to the catchy rhythms and feels.

Specific equipment was used for delivery of the intervention (headphones and MP3 player). A consultative process was also undertaken with ED nurses, international music therapists, and a major airline, in order to address issues of infection control. Combined knowledge resulted in disposable headphones and small sealable plastic bags for MP3 players which were acceptable in the ED context.

Dose received

In terms of exposure to the intervention, participants were asked to listen to the music when possible during a 2-hour study period. Not surprisingly, patients experienced interruptions while listening to the music. More than half of the patients (9/15) responded that they had been interrupted during this time, and of these all indicated that it was “sometimes” or “often”. The most common reasons for such interruptions was “family/friends” (4/9) and “medical staff” (5/9). Most participants chose to listen to more than one style (10/15). Table 2 shows the distribution of GRP music listening choices across age groups. Given the small numbers, it was indeterminate whether any assumptions about age and style of music were supported.

Table 2

Age and Music Genre Usage of Pilot Project Participants.

<i>Age group</i>	<i>Frequency</i>	<i>Music genre (GRP)</i>				All equally
		Modern	World	Ambient	Classical	
20-34	4	3	1			
35-49	1					1
50-64	7	2		2	3	
65 and over	3	1		1	1	
Totals:	15	6	1	3	4	1

When asked if the music had made a difference to how they felt while in the ED, 14/15 patients responded “yes” and when further questioned about the nature of this difference, the average score on the VAS (1=the music made me feel worse; 10 =the music made me feel better) was 7.4, with a range of scores from 5 to 10. None reported that the music made them feel worse. Six of the 15 participants offered additional comments about the music, as shown in Table 3, which included themes of peacefulness, quietening down, calming and relaxing.

Table 3

Participant comments about usage of GRP

<i>Comments about the music intervention</i>
Thought it was absolutely fabulous, blocked out conversations
Gives you more time out of here, more peaceful
Good choice of music
Quietened me down
Calmed me right down
Very good idea for passing the time, relaxes you

Fidelity

The concept of fidelity is defined as the “quality of implementation of an intervention” (Linnan & Steckler, 2002, p.13). The research assistant checklist confirmed that implementation activities occurred correctly, and was fully completed for each participant. During implementation, there were no MP3s stolen or misplaced. In fact, staff contacted the investigators on one occasion when one player was briefly left on the ward in the wrong place. Patients generally had no difficulty with using the players – and only one needed additional help with using the equipment soon after commencing the music intervention. Steps planned to address infection control issues were undertaken as planned (disposable headphones, small plastic sealable bags), with no further issues arising.

Implementation

According to Linnan and Steckler (2002), implementation combines reach, dose, dose received and fidelity to produce a calculated numerical score. Such a process evaluation score was not relevant to the current intervention.

Recruitment

Gender differences occurred in this pilot study, with recruitment comprising 12 males and 3 females, an unexpected inequity. The spread of age groups (23-91 years) matched expectations. Only one patient was recruited from a non-English speaking background (Vietnamese), but did not receive the music intervention. Despite careful planning, unexpected difficulties arose with availability of interpreters, which affected recruitment. However, another factor was that fewer than expected culturally and linguistically diverse (CALD) patients of the targetted groups meeting selection criteria attended the ED during the study implementation times. Overall, of those declining to participate in the study, a typical reason was “too much pain”.

Discussion

This paper has documented a clear and systematic developmental process for a receptive music tool which was devised for a hospital-based research purpose (as summarized in Figure 1). In doing so, it provides an explication of the stages of gathering and applying both theoretical and practice knowledge in an integrated and iterative manner. It demonstrates that it is possible to go beyond the knowledge, understandings and perceptions of an individual music therapist (however well trained and experienced) by formally incorporating multiple perspectives and information sources such as key informants from the music industry, community organizations and other staff in conjunction with patient needs and situational demographics. From this, a relevant and meaningful tool was developed which potentially has broad applications to a range of clinical settings. Via an innovative application of process evaluation techniques, results of pilot-testing this tool in the ED are incorporated into an overarching framework, including objective and patient-oriented understandings into a documented clinical review.

Results from a further process evaluation support the assertion that the developmental process has the capacity to link theory with an iterative development process. In doing so, it uses key informant and practice knowledge and experience in order to isolate a limited number of relevant genres for the GRPs and to make selections within each genre. The process evaluation confirmed that known characteristics of relaxing music are present in the GRPs, although with some variation due to genre. Further development is suggested in order to additionally refine this iterative music development process. In particular, issues linking music and culture require a more systematic approach, possibly including the use of cultural advisors, as put forward in another context (Lo & Fung, 2003).

Patient recruitment for the pilot study did not demographically match expectations, except with regard to age. There was an inequity of gender and CALD communities in those recruited, which was most likely due to the small sample. It may also reflect an apparent anecdotal reluctance by females, especially older women, to be formally involved in research, especially if they are in pain or feeling vulnerable in the ED context. The lack of non-English speaking participants may relate to the unpredictability of ED presentations and the limited availability of bilingual workers to assist the project. Challenging an implicit assumption that patients may have only one type of music to relax to, it was found that most participants listened to more than one genre. Choices did not appear to relate to age group, for example, the modern playlist was selected by 4 people over 50 years old. This is despite the fact that 7 out of the 8 tracks on the modern playlist were released during the last 5 years and reminiscence theory suggests that older people typically select music from their youth (Janssen, Chessa & Murre, 2007).

Insufficient information was gathered about the choice of genres as related to age group in the light of musical characteristics, and this should be explored in greater depth in the future. It would be helpful to explore how demographics can be used to better plan music programs. A broad questionnaire, such as that used by Spintge (R. Spintge, personal communication, 21 January, 2008) may assist, however in applying an intervention such as the present study to the needs of a very diverse population there are no simple answers.

Nevertheless, indications were that the four GRPs developed worked in the ED, that is, patients reported feeling better because of the music. This in turn offers the rationale for refining and testing the music tool across a larger population in the ED, in order to obtain a large data set and obtain statistical significance. Patients generally showed approval of and appreciation for the GRPs. The reported impact on emotional state suggests further potential for matching the music to the emotional state of the patient in the ED, and requires sensitive validated scales to assess this in the ED context. The isoprinciple (Altshuler, 1948, Short, 1992c) infers a need to match the music not only to the emotional state of the person but also perhaps to the physical context and environment in which they need to relax, with a clear relationship to the patient's stress level and the auditory environment. Questions remain about the exact musical characteristics of each selection which need to be investigated with a view to gaining further linkage between patient needs and the clinical setting.

Implementation of this uniquely developed music tool in the emergency department for a time span of 2 hours was found to be feasible. Patients with a wide range of diagnoses participated in the study, with successful attention to infection control and other clinical health issues. Patients were able to listen to the music, despite interruptions and the needs of an acute care situation. They reported gaining benefits from the music in terms of the masking of other noise, passing the time and particularly evoking a sense of peace and calmness. Despite theory indicating the need for a quiet room and comfortable chair to provide a relaxing listening environment (Krout, 2007), the busy and noisy context did not preclude using music effectively for stress reduction. The possibility of using music to alleviate noise stress offers potential in improving the critical care environment of the emergency department.

The major limitation to this study was its size, given that it was a pilot of the music intervention within the SSED project. Nevertheless, it showed that effective linkage could be established from theory to intervention development in the clinical setting. Engaging professional music therapy knowledge in developing music choices for relaxation provided a skills base integrating musical, stylistic, cultural and clinical issues within the medical setting. Such integration has the capacity to increase uptake, success and appropriateness, in order to foster relaxation for the health of all concerned.

Final comments

This methodological paper has demonstrated the usefulness of a process evaluation in order to review the development and implementation of a receptive music tool, as applied to a specific clinical context. Further studies are needed to extend the understanding and applications of such a process evaluation in order to promote evidence-based linkage from theory to practice.

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Glossary

Term or acronym	Definition or description
AMPR-P	Analysis of Musical Parameters for Relaxation-Pilot (AMPR-P). Developed by A.Short for the current project.
BMGIM	Bonny Method of Guided Imagery and Music, also commonly know as “GIM” (Bruscia & Grocke, 2002).
CALD	Culturally and Linguistically Diverse
dB	Decibels. Note that the measurement of decibels is a logarithmic scale.
DDHNS	Disturbance Due to Hospital Noise Scale (Topf, 1985).
ED	Emergency Department
GCS	Glasgow Coma Scale (Teasdale & Jennett, 1974). This is a neurological scale which assesses the conscious state of a person - normal alert score is 15.
GRP	Genre-based Relaxation Playlist. Developed by A. Short for the current project.
NAATI	National Accreditation Authority for Translators and Interpreters
PANAS	Positive and Negative Affect Scale (Watson, Clark, & Tellengen, 1988)
SSED	<i>Sound and silence in the emergency department: An exploration of noise in relation to patient stress responses</i> . A specific funded research project (Short, Holdgate & Cox, 2006).
Triage category	Based on the Australasian Triage Scale for emergency departments (ACEM, 2000). Category 1. <i>Immediately life-threatening</i> . Immediate assessment and treatment Category 2. <i>Imminently life-threatening or important time-critical treatment</i> . Assessment and treatment start within 10 minutes Category 3. <i>Potentially life-threatening or situational urgency</i> . Assessment and treatment start within 30 minutes. Category 4. <i>Potentially serious, situational urgency or significant complexity or severity</i> . Assessment and treatment start within 60 minutes. Category 5. <i>Less urgent or clinico-administrative problems</i> . Assessment and treatment start within 120 minutes.
VAS	Visual Analogue Scale (for example, Kindler, Harms, Amsler, Ihde-Scholl, & Scheidegger, 2000)

Appendix 1

Analysis of Music Parameters for Relaxation (AMPR-P) Music Program.

Parameter 1	
<i>To what extent does this music have... a slow and stable tempo (pace or speed)?</i> Comments:	..... Score: (1-10) (1=least, 10=most)
Parameter 2	
<i>To what extent does this music have... a low volume level and soft dynamics?</i> Comments:	..... Score: (1-10) (1=least, 10=most)
Parameter 3	
<i>To what extent does this music have... a consistent texture (combination of sounds and instruments)?</i> Comments:	..... Score: (1-10) (1=least, 10=most)
Parameter 4	
<i>To what extent does this music have...percussive and accented rhythms?</i> Comments:	..... Score: (1-10) (1=least, 10=most)
Parameter 5	
<i>To what extent does this music have...a gentle timbre (sound or tone colour)?</i> Comments:	..... Score: (1-10) (1=least, 10=most)
Parameter 6	
<i>To what extent does this music have... legato (connected) melodies?</i> Comments:	..... Score: (1-10) (1=least, 10=most)
Parameter 7	
<i>To what extent does this music have...simple harmonic or chord progressions?</i> Comments:	..... Score: (1-10) (1=least, 10=most)
Parameter 8	
<i>To what extent does this music have...smooth transitions from one track to the next?</i> Comments:	..... Score: (1-10) (1=least, 10=most)
Parameter 9	
<i>To what extent does this music ...promote inappropriate cultural views e.g. violence, racism?</i> Comments:	..... Score: (1-10) (1=least, 10=most)

Parameter 10			
To what extent does this music have... particular associations which carry emotional demands and stimulation? Comments:		..... Score: (1-10) (1=least, 10=most)	
Parameter 11			
To what extent does this music... use pentatonic scales or motifs? Score: (1-10) Comments:		..... Score: (1-10) (1=least, 10=most)	
Parameter 12			
To what extent does this music have... a jazz influence? Comments:		..... Score: (1-10) (1=least, 10=most)	
Parameter 13			
To what extent does this music show... characteristics & musical style suitable to these language groups...?			
...Spanish? Comments:	..... Score: (1-10) (1=least, 10=most)	...Arabic? Comments:	..... Score: (1-10) (1=least, 10=most)
...Vietnamese? Comments:	..... Score: (1-10) (1=least, 10=most)	...Chinese? Comments:	..... Score: (1-10) (1=least, 10=most)
Final comments			
How would you describe this music, in your own words?			

Playlists and Patients' Preferences: A Commentary on Short and Ahern's 2009 article.

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The relationship between music medicine and music therapy is changing these years. And so is the role of the music therapist in music medicine. From a peripheral role in the administration of music in hospitals and other medical institutions music therapists are moving to leading roles in the selection of music suitable for music medicine interventions and for training nurses and other members of medical staff to administer music in hospital settings.

Short and Ahern's article bears witness of this development; the music therapist is no longer an outsider but a central person in a holistic environment. From an international point of view I think this must be the way to proceed if we want music therapy to play a role in an integral agenda for the health services of the future. We cannot leave music medicine to the medical professionals! On the contrary, the situation calls for close collaboration. But how?

One reason for me to welcome Short and Ahern's article is that it deals with two important agendas: 1) designing research in music medicine (by music therapists); 2) developing evidence based music therapy practices in hospitals, including music medicine.

The theoretically informed development of genre-based relaxation playlists (GRP) is carefully described in the article, and Short and Ahern is in line with Spintge's view that "it is the situation and the patient's preferences which have to be considered", and "genres tell nothing about therapeutic capacities of any piece of music". My experience is that music is far too often used in hospital settings without involving the patients' preferences. Choice, programming or composition of new music is often based on naïve assumptions on genre. However, genre is a descriptive, not a normative category (Bonde, 1997), and expert music selection must be based on thorough knowledge of the relationship between therapeutic goals and properties of the music (Grocke & Wigram, 2007). Patients' right to choose must be respected, and their choice should be based on short excerpts of the programs/styles available, not on genre labels. These are all integral qualities of the GRP as described by Short and Ahern.

The big question is how to develop GRPs in a specific clinical contexts. For me as a Danish music therapist and researcher it is surprising and stimulating to see a Danish product – the specially designed music environment, *MusiCure* (in this study categorized as "ambient music") – used

as part of an Australian GRP giving the patient control over the choice of music. In fact, there is an interesting paradox here.

The inventors of *MusiCure* present their product as a research based and well documented special music environment for hospitals: “*MusiCure* is scientifically documented on more than 4000 hospitalized patients over a period of more than 8 years, and has been composed and produced especially for this purpose.” (www.musicure.com – see also www.musicahumana.org). Several studies and many conference presentations have been made, and they all support *MusiCure* as an appropriate and effective music intervention for hospitals (e.g. Thorgaard, Ertmann, Hansen, Nørregaard, & Spanggaard, 2005). However, when taking a closer look at the available research protocols initiated by the *Musica Humana* organization it becomes clear that *MusiCure* has actually never been compared to other experimental music conditions – only to nothing or to hospital soundspaces. For me this is problematic, both from a scientific and from an ethical point of view. I acknowledge the professionalism of *MusiCure*, its clinical potential and the results of the research so far, but again: Short and Ahern’s present GRP study and many other studies underline the importance of participants’ choice as a major influence on the outcome of music interventions.

In Short and Ahern’s study *MusiCure* is included as one of four musical genres, and this is fundamentally the way I think it should be. I can mention two recent Danish studies based on the same idea and design. Karin Schou (2007) reports from her PhD study of *Guided Relaxation and Music* with patients in cardiac care at Aalborg University Hospital how participants chose between four playlists (or GRPs): 1) Classical, 2) *MusiCure*, 3) Easy Listening, 4) Jazz (light). Thirty minutes of music was combined with guided relaxation (condition 1) or music listening with an attendant (condition 2) as opposed to rest in silence (control). Sixty patients in two conditions (GRM and ML) chose music as follows: Easy Listening 60%, Classical 25%, *MusiCure* 12.5%, and Jazz 2.5%.

Recently I was invited to design a parallel study in a psychiatric ward. The head psychiatrist wants to investigate if music listening (listening with an attendant) can help psychiatric patients in acute crisis (100% presence of an attendant, also including fixation). Based on the results of Schou’s study and inquiry into the specific needs of the psychiatric patients at the ward I have constructed a revised GRP. Easy Listening, Classical and *MusiCure* are complemented by Modern (instrumental rock type in medium to slow tempo, compiled from two CDs called *No Stress*) and Nature sounds (A Danish Meadow soundscape with a nightingale and other birds). This project is currently being piloted, so I cannot report any results. But it is clear to me that goals and theoretical basis of the two Danish projects are very close to Short and Ahern’s study.

My conclusion is that the GRP concept has come to stay! The next step could be the development of international, joint GRP protocols in selected clinical areas.

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