An exploration of music listening in chronic pain

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Abstract

Chronic pain is a major health problem and, as direct treatments often fail to offer lasting pain relief, more effective self-management strategies are needed. There is evidence that music listening can provide relief of pain and accompanying emotional distress in acute settings, primarily through distraction. Less is known about the functions of music listening in chronic pain although survey research has suggested that it could aid distraction, relaxation and sense of control. Building on these findings, this qualitative study explored the narratives of 11 people living with chronic pain about the perceived impact of music listening on pain experience. The results indicated frequent loss of involvement with and enjoyment of music following chronic pain. Despite this, music could improve emotional state and uplift, console, energize and relax the listener and offer a sense of companionship. Conversely, at times it could upset or irritate. Music could act as a distraction from pain, as a cue to movement and as a motivator to exercise. Finally, music could provide a link to memories of a self before pain and escape from a painful body. All these functions have potential for development as effective self-management strategies for chronic pain.

Keywords

chronic pain, distraction, music, pain management, qualitative, self-identity

Introduction

Chronic pain is a major health problem that affects an estimated 7.8 million people in the United Kingdom (Chronic Pain Policy Coalition, 2007), places severe and wide-ranging limitations on the quality of life of those who experience it (Brevik, Collet, Ventafridda, Cohen, & Gallacher, 2006) and is a major burden on society (Chief Medical Officer, 2008; Phillips, 2006).

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It is a complex condition associated with increased sensitization of the nervous system which often fails to respond adequately to direct treatments, leaving many without lasting pain relief (British Pain Society, 2004; Jamison, 2011).

Chronic pain can limit physical functioning, emotional well-being, the ability to work, social activities, relationships with others, self-identity and sleep (Brevick et al., 2006; British Pain Society, 2007; Morley, 2008). As the physical and emotional aspects of pain are intertwined and the predictors for long-term disability are overwhelmingly psychosocial rather than biological (Main & Williams, 2002), the biopsychosocial model has been widely adopted as a useful theoretical basis for understanding the experience of chronic pain and for guiding the development of new treatments (Engel, 1977; Romano & Turner, 1985, cited in Turk & Monarch, 2002).

The biopsychosocial model acknowledges interaction between the many factors which operate together in chronic pain; these include neurological and physiological states, physical functioning, beliefs and coping skills, emotional states, behaviours and social interactions. The complex interactions between these dimensions of pain experience mean therapeutic interventions tend to operate on multiple levels, so a physical intervention may effect psychological well-being and pain beliefs and vice-versa.

Music, like pain, is a powerful multidimensional experience with sensory, emotional, cognitive, behavioural and social elements. Like pain, the power of music may be related to its operating simultaneously on multiple levels. Music can perform many functions in everyday life; some of these can be categorized as self-regulation (see Clayton, 2009; Saarikallio, 2011), for example to improve emotional state, to aid coordination of bodily movement, to improve motivation for and enjoyment of (amongst other things) exercise, to aid relaxation and as a distraction (Sloboda, Lamont, & Greasley, 2009). Clayton (2009, p. 41) identified a second important function of music as 'mediation between the self and the other'; music performs an important role in developing self-identity and in enhancing communicating with others (North, Hargreaves, & Hargreaves, 2004). Indeed, Sloboda (2003, p. 42) described how music is commonly used as a 'self-administered emotional therapy'. The power of music to influence these two functional categories, which include many of the factors listed earlier as significant in chronic pain, clearly indicates its potential for use in pain management.

Music listening has been found helpful in managing pain in adults in both experimental (e.g., Mitchell, MacDonald, & Brodie, 2006) and diverse acute medical settings including dental, procedural, post-surgical, cancer clinics and during childbirth (Buck & Morley, 2006; Standley, 1995; Voss et al., 2004). However, a Cochrane review of the use of music for pain relief (Cepeda, Carr, Lau, & Alvarez, 2006) concluded that, although music listening reduced reported pain and analgesic requirements, the clinical relevance remained unclear. The research assessed included diverse clinical groups, only one of which included adults experiencing chronic pain (McCaffrey & Freeman, 2003) whose findings for older adults were later supported by Siedliecki and Good (2006). It is disappointing that no recommendation could be made regarding the characteristics of patients, clinical settings or procedures for which music might offer the most benefit for pain relief, nor for the optimal choice of music and its delivery which could guide future research. Furthermore, in chronic pain management valued outcomes extend beyond improving pain level to mood, coping, negative outlook on pain and activity levels, and more recently to factors such as acceptance (McCracken & Velleman, 2010) and self-identity (Sutherland & Morley, 2008).

In considering the mechanisms for the impact of music on pain, it has been suggested that music, as an emotionally engaging stimulus, could provide a particularly effective distraction

from pain (Roelofs, Peters, van der Zijden, & Vlaeyen, 2004; Roy, Pertez, & Rainville, 2007). A series of high-quality experimental studies confirmed that self-selected music is more effective than experimenter-selected music (Mitchell & MacDonald, 2006), audio-recorded humour or arithmetic (Mitchell et al., 2006) and visual stimuli (Mitchell, MacDonald, & Knussen, 2008) in improving pain tolerance and perceived control over pain in an experimental setting with healthy individuals. Response to music is determined both by elements of the music itself, such as tempo, key, timbre structure and predictability, but more significantly by the personal and cultural background of the individual listener, with self-selected music invariably (but not always; e.g., Siedliecki & Good, 2006) being perceived as more powerful (Sloboda, 2003), so choice of music for pain management is also likely to be influenced both by elements of the music and by its meaning to the individual.

While these studies offer some support for the potential use of music as a pain management technique in chronic pain, this evidence is at present limited and research remains in the early stages. In order to develop this limited understanding, a postal survey was used to examine patterns of music listening and perceptions of the effects of music listening on pain experience and quality of life in 318 people who had attended a chronic pain clinic (Mitchell, MacDonald, Knussen, & Serpell, 2007). The most frequent reasons given for listening to music were for enjoyment, relaxation and to reduce tension, with the addition of distraction in response to an open question. A striking finding was of a positive correlation between higher overall quality of life and more frequent music listening and perception of music as personally important. This survey provided a very helpful overview of how people with chronic pain may benefit from listening to music. A closer analysis of the impact of music listening on the experience of individuals with chronic pain has the potential to improve understanding and guide the development of helpful music-based pain management strategies.

When many factors are involved as they are in both chronic pain and music listening, qualitative methodology can help identify how these may operate and interact. Qualitative methods have shown particular value in understanding the multidimensional experiences of people with chronic pain, identifying key themes such as the struggle to understand and 'validate' chronic pain as a legitimate condition, feelings of hopelessness, loss and stigma, communication difficulties and the resulting impact of all these on self-identity (Corbett, Foster, & Ong, 2007; Mitchell & MacDonald, 2009; Osborn & Rodham, 2010; Osborn & Smith, 1998, 2006; Smith & Osborn, 2007a). A recent phenomenological study examining music listening experiences of women with chronic illnesses (Nicol, 2010, p. 364) concluded that its potential as an 'intentional therapeutic medium' deserves further investigation.

Interpretative qualitative analysis (IPA) is a qualitative methodology frequently used in clinical health psychology research with a growing body of research in the area of chronic pain (Smith & Osborn, 2007a, 2007b; Snelgrove & Liossi, 2009). IPA seeks primarily to understand the 'lived experience' of participants and to identify how they make sense of and attribute meaning to their experiences. Analysis is an iterative process that requires the researcher to reflect on their own preconceptions about the data and how these may be influencing their interpretation. This recognition of the researcher's perspective allows examination of the association between themes emerging from analysis and psychological theory.

In summary, although music is often used in acute medical settings and people with chronic pain report that they commonly use music to improve pain experience (Mitchell et al., 2007), evidence to support its use for pain relief is equivocal (Cepeda et al., 2006). The processes involved are as yet unclear and likely to be influenced by many factors, including elements of

Table 1. Anonymous demographic information.

Name	Sex	Age	Ethnicity
'Amy'	Female	53	White British
'Jenna'	Female	64	Any Other Asian
'Martha'	Female	81	White British
'Connie'	Female	53	Mixed White Asian
'Holly'	Female	23	Any Other White
'Brian'	Male	63	White British
'Grace'	Female	72	White British
'Pat'	Female	60	White British
'Selma'	Female	70	Any Other White
'Will'	Male	56	White British
'Ivan'	Male	59	White British

the music and its meaning to the listener (Clayton, 2009). Given the lack of research in chronic pain settings and the aforementioned uncertainties, an open, qualitative exploration of the music-related experiences of people with chronic pain, describing in their own words how music could influence pain experience, offers considerable potential to guide the development of music-based chronic pain management strategies. This approach allows both a deeper analysis of known functions of music, such as distraction and mood moderation, plus the identification of new functions suggested by patient experience.

Through improved understanding of the experiences of participants, the primary aim of this study is to develop better informed guidelines to assist people with chronic pain to develop more effective and flexible music-based self-management strategies which they can adapt to suit their individual circumstances.

Method

Participants

Ethical approval for the study was granted by the National Health Service (NHS) London-Surrey Borders Research Ethics Committee (09/H0806/5). All participants were attending a multi-disciplinary chronic pain clinic at the time of data collection, were experiencing complex multi-sited pain of at least two years' duration, and had been referred for non-medical pain management. Purposeful sampling was used at assessment to identify those with levels of pain-related disability and distress sufficient for referral to develop more effective self-management strategies. Inclusion and exclusion criteria were therefore those of the Pain Management Service, available on request. Demographic information for each participant is listed in Table 1 with names changed to protect confidentiality. None had previous experience of music therapy although by agreeing to be interviewed it is likely that participants had some interest in music.

Procedure

Consecutive potential participants were presented with information about the study after assessment by one of the multidisciplinary team. It was made clear that the study was optional and separate from normal care. Those who expressed an interest in taking part were given an

information sheet and the opportunity to discuss any questions about the study before written consent was obtained on a separate day before the interview. All interviews took place at the pain clinic with only the interviewer present. Interviews were digitally recorded and lasted between 20 and 45 minutes. Participants were reminded that they were free to drop out at any time; however, none withdrew.

Data collection

A semi-structured interview protocol was piloted before agreeing a final version. This protocol was used as a general guide but participants were encouraged to move freely in their descriptions of their experiences in order to avoid undue influence by the interviewer and every effort was made to avoid leading questions. Interviews were introduced with a brief summary of the purpose of the study followed by an open question about the importance of music in participants' lives. Subsequent questions looked at participants' experiences of listening to music both before and after the development of their chronic pain to explore their perceptions of the impact of music on pain experience. All interviews were conducted by either author of the study who discussed the process thoroughly throughout to ensure standardization of approach.

Analysis

Transcriptions of all interviews were analyzed using IPA in accordance with the procedure outlined by Smith and Osborn (2007a). An idiographic approach was used to identify themes and repeated for all transcripts until a final list of super ordinate themes was constructed, based on all the data. To clarify key areas of importance, themes were considered in relation to each other to explore the interrelated nature of emergent themes and ways in which main themes were represented within seemingly unrelated sub-themes.

Validation of results followed the recommendations of Smith and Osborn (2007a) for IPA, addressing the need to confirm the internal coherence and credibility of the presented analysis. Separate analysis of the individual transcripts was conducted by both researchers to ensure that there was sufficient evidence in the data to support the identified themes; final themes were agreed following discussion between the two analysts. No instances of disagreement occurred after this validation. Cross-validation of themes was conducted by discussing the interpretation of results and emergent themes with the participants during follow-up appointments at the clinic, with a group of eight people attending a pain management group programme and other members of the multidisciplinary pain management team including psychologists familiar with qualitative analysis. All discussants were happy with the interpretation and coherence of results, that all themes were supported by sufficient data from the transcripts and did not feel anything had been missed.

Results

Three super ordinate themes emerged from the analysis, presented in Table 2. The first described reduced involvement with music as a result of living with chronic pain and possible reasons for this change. The second outlined perceived effects of music on aspects of pain experience, both positive and negative, and how personal preferences could affect the strength and valence of these responses. The final theme described how music could distance the listener from pain experience.

Table 2. List of super ordinate themes and sub-themes.

1. Reduced involvement with music in pain
Lost enjoyment
Loss of access
Thoughts of re-engaging with music
2. Response to music: sensory and emotional links to pain
Positive effects: Uplifting, energizing, soothing
Negative effects: Irritating, agitating, upsetting
Music as a cue to movement
Personal preferences: variability in response
3. Moving away from pain
Distraction
Music as a cue to memory
Out of a painful body

Reduced involvement with music in chronic pain

Lost enjoyment. More than half of participants ($n = 6$) reported that, although they could remember how they valued listening to music and could list several functions that music played in their lives, for example for enjoyment, aiding concentration and providing the opportunity for social activity and shared experiences (see below), since having chronic pain they were now aware that they had stopped listening to and enjoying music:

> I used to like music more than I do now. When I was working I used to teach music and I used to enjoy it. I'd like when I'm working to have the radio on in the background and usually music. And in the car . . . I would have that on. But now I don't spend much time listening to it at all. (Jenna)

> I don't [listen to music] very often at the moment, I have to say. So perhaps that's the effect of the pain, I don't know. (Will)

Furthermore, Jenna indicated that whereas she 'used to enjoy' music, since having chronic pain, music could produce a negative emotional state:

> I find it a little bit irritating whereas before I didn't. (Jenna)

It was striking that participants expressed surprise at recognizing this change during the interview process. One participant described how this change had taken place without her being aware of it:

> As I knew I was coming to see you I was thinking back when was the last time that I really sort of listened to music properly and it must be quite some time now . . . It just sort of went like that. (Amy)

Loss of access. This loss appeared to result partly from limitations with access to activities associated with music listening such as work, driving and socializing and partly because of pain's impact on mood and concentration. For Jenna, being unable to sit comfortably because of pain meant that she could no longer enjoy sitting to listen to music, while Grace could not stand for long enough to sing as she used to:

> Well once upon a time I would have music on . . . when I was doing any sort of activity but now . . . But now I don't . . . It gradually stopped, yeah, as I realized I couldn't sit and do it I stopped doing it. It was too much effort really . . . I wish I could go back to what it was and enjoy it the way I used to. I don't go to any concerts now because I find sitting in the seats very hard. (Jenna)

> The only thing to do with singing is you do it when you stand up, and I can't stand up very long. (Grace)

The narratives of both Amy and Jenna suggest that listening to music required energy or concentration that they no longer had; Amy said that it was some time since she listened to music 'properly' and Jenna stated that 'it was too much effort really'. She had stopped listening even to background music which would require relatively little effort. Jenna introduced her description of this change with the words 'once upon a time', indicating that she perceived a dichotomy between her present situation and that of the past when she was able to enjoy music without restriction; later, she wished she could go back to that time and enjoy music as she used to. Holly also found it frustrating that she was no longer able to move to music as she had before she developed chronic pain:

> Well for me, that's movement. I am not able to, not as I would like to. It's frustrating. . . (Holly)

Mental changes were also identified as a reason for using music less, with Will suggesting that pain was at the forefront of his mind and overwhelming his mental capacity:

> Perhaps my mind is not in the place to be able to sing-along, I don't know . . . Perhaps that the pain is more important than singing along, I don't know. (Will)

Thoughts of re-engaging with music. Through the course of the interviews, several people said that they had become conscious of the possibilities offered by music listening and resolved to start listening again. However, although recognizing that it might be helpful if she was able to listen to music again, Jenna implied that this would be difficult for her – 'I just don't' – reflecting the frustration felt by many when attempts to manage their pain are unsuccessful:

> Perhaps that's something I should try and do again, but I just don't. I just found it an extra problem . . . Well you've given me some thoughts that I could try using music again . . . It never occurred to me to do it. It's something I might go back and try. (Jenna)

> Perhaps if I could, perhaps it might help my pain. I don't know. It's an interesting thought I have to say – I thought about this. (Will)

> You know it's such a shame I haven't been listening to music for quite some time . . . I'm sure it can [help] . . . I never really thought about music helping me . . . I have to try and experiment. (Amy)

Response to music: Sensory and emotional links to pain

Positive effects: Uplifting, energizing, soothing. Unsurprisingly, music was reported as having a strong positive impact on mood and arousal. It could also offer a sense of companionship, aid both physical and mental relaxation and finally soothe and console. Some consciously chose to listen to upbeat music to lift their spirits both when they were feeling miserable and in order to increase feelings of energy:

> It lifts my spirits. When I get up I go to the bathroom and the first thing I do is switch on the radio . . . And that immediately lifts me and starts me for the day. (Grace)

> If you're feeling a bit down, it can lift you. Especially if you've got something um bright and breezy, so to speak, I would select music then, according to my mood. (Jenna)

Sad music could also elicit positive effects, particularly as described by Martha through release of negative feelings or by Selma as offering deep support which helped alter her perception of pain:

> Oh I think it helps. It wells everything up and out . . . it lifts the spirit, makes you feel good. And it – well it can bring a tear if it's very, very moving but it's a good tear. (Martha)

> It would be to feed my spirits. A very sad piece of violin music or something, it could go into the soul and then sort of carry you forward . . . so that at the end of the piece of music, the situation [the pain] might not have changed but the way you perceive it does . . . It helps to support you. It doesn't change anything but it supports you. (Selma)

By identifying with negative emotions expressed by the performer, Selma described how she could release her own feelings, which she described as 'passing the buck':

> When I feel very emotional that's the sort of music I want in because in their emotion, mine calm down. Only I'm passing the buck . . . Well I'm getting it out of me and transferring it so I can relax. She's taken the aggression out of me you know [laughs] and the fraughtness [sic] and everything. (Selma)

Identifying with the performer could provide a helpful sense of connection: Will and Jenna described how they felt less lonely with music offering a sense of company:

> If I'm feeling lonely then I will feel less cut off when music is on, I don't know why, it's like an old friend . . . just a sense of companionship. (Will)

> 'Cos it's partly company as well. (Jenna)

While one positive effect of music listening was to uplift mood, it was also seen as beneficial by enhancing physical relaxation with associated feelings of calmness, security or comfort. The physically soothing effects of music and the resulting decrease in pain experienced were typified by Connie:

> It helps me relax so the muscular – the muscular pain definitely, because I'm relaxed, it sort of lessens then goes away . . . Because I found with relaxation for the pain, I find it easier to go deeper with music in the background. (Connie)

The impact of music on both mental and physical aspects of relaxation was summarized by Ivan:

> So it's doing two things. I think it's turning the temperature down on the mind, so the mind stops going too fast. And, secondly it relaxes the body itself. I think it relaxes the muscles and things like that. (Ivan)

Jenna, Ivan and Amy described how they found music helped to soothe during an episode of increased pain by providing a feeling of comfort, consolation and protection, with Jenna finding that the familiarity of music gave a sense of connection. All used powerful imagery to describe this effect:

> It calmed, yeah. It gave me a feeling of security too. It's like a comfort blanket almost, something you knew. And you would wrap yourself in it. It was comforting . . . Calm is not the right word, comforting; consoling is a better way. It's something that you know and you can relate to and it's different to that. It's stronger. (Jenna)

> I will use music to try and soothe that pain. To wrap a balm around the pain. (Ivan)

> I don't know how to say it but with the music it kind of soothes and washes it. (Amy)

For Amy, this effect was related to characteristics of the music and perceived as changing both her mental and physical state:

> I think the tone, beat, it could sort of dull you, hypnotize you and it could sort of lull you in a spaced out kind of way. (Amy)

Holly described her awareness of the links between mood, relaxation and pain experience:

> I think 'cos when you're in a good mood then pain is less. Significantly. [Interviewer: In what way? Why would it be less significant?]
> Um 'cos when you're in a good mood, you're relaxed and I think it helps in getting over pain . . . I use music to help myself. To lift up my spirits and lift up my mood and to relieve pain as well because my problem is very interrelated with my emotions. (Holly)

Irritating, agitating, upsetting. Irritation was frequently mentioned as being triggered by music, typically by music described as loud with a repetitive beat:

> The noisy music I can't stand. It makes my head throb and I don't want to be bothered by that. And some of the music that's got that terrible beat to it irritates me, and quite badly . . . The pain is connected with headaches and the throbbing would go right through me and that would be really an intense feeling. I just would be extremely irritated and aggravated. (Jenna)

Some participants expressed an understanding of how negative effects of music listening could impact on pain experience, particularly through increased muscular tension:

> Modern jazz is a clash in my head and it just makes me tight really . . . it makes me irritable . . . and then perhaps that makes me feel the pain more. If your body stresses or tightens, that will make pain worse because the whole idea is to keep relaxed. (Pat)

There was a particular risk that, when pain levels were severe, music could be an irritation rather than a help. At such times:

> If I was really in a lot of pain and there could be times when I'd find music irritating. 'Cos the pain was taking over. (Grace)

> Perhaps it's like my pain. Perhaps there's a threshold with music where I get to and think 'No I can't listen to that, that's just sort of jarring more on my brain'. (Will)

Finally, when pain was most extreme:

> I suppose it depends on the level of pain. 'Cos loud music could make a headache worse. It does depend on the level of pain. And other factors around. [Interviewer: Like what?]
> If you're in severe pain I just want silence. I just want to be left alone in the dark sort of thing. But experiencing it [music] can relax the body. And therefore, if you can relax, then pain can become less severe 'cos you're not tensing everything up. (Selma)

Music as a cue to movement. The impact of music upon pain experience was described by several people using images containing movement, for example:

> I was just thinking, visualizing it, and could you imagine water flowing fast and you being carried through on it. (Selma)

> It wells everything up and out. (Grace)

Music could act as a cue for movement even when the listener was sitting down:

> The way I do it I'm not sitting back and [closes eyes] letting it waft around . . . I tend to jig with it. I'm doing this you know [moves as if listening to music] . . . I tend to move to the music and get involved. (Brian)

> And if I switch on and there's something that I really love, wherever I am, I'm ready to boogie. Even with the pain [laughs] ready to boogie. (Grace)

Exercising to music was experienced as more enjoyable and consequently more likely to be carried out regularly:

> Well exercises in themselves are very boring. Oh it's a terrible chore. And you think, oh well I'll skip it this day. It's having something nice to go with it, something you anticipate that's pleasurable and exercises aren't. (Selma)

Further, Grace considered that, not only did listening to music make exercise less boring and more enjoyable, it also increased her motivation and encouraged her to continue for longer than she would otherwise:

> To make it less boring, and I think it makes you maybe push yourself a wee bit further . . . But if you've got music and there's a beat there, you may try to do a bit longer, a bit more, whatever . . . because it makes it more interesting. You're motivated to do it, it's more fun. (Grace)

During exercise, the relaxing effect of music was also observed to be useful, enabling a less effortful and possibly more 'mindful' approach or 'going with the flow':

> Um it becomes a little bit more like a yoga exercise with the music. Instead of you trying to centre all the time, the music helps centre you so that you're doing and going with the flow and your body's relaxing in to things. (Selma)

No-one currently reported using music to maintain the pace of exercises, background music being preferred as a general motivator or for distraction while remaining aware of the need to pace activity:

> I don't use a very fast tempo ever for exercising, ever . . . I do it half time. Instead of doing it boom boom boom, I do it boom – boom – boom. (Martha)

Personal preferences: Variability in response. Most of those interviewed described musical preferences formed in childhood and particularly adolescence which were clearly linked to self-identity and consistently this preferred music was described as having the most impact:

> Perhaps it goes back to childhood I suppose. My teenage years where I used to really enjoy music, the lyrics, it meant something and it used to make me feel good . . . You can try new things but you do come back to your familiar things [favourite music] that can satisfy you. (Will)

Music was selected depending upon context and intended function, specific music being chosen for relaxation, to accompany exercise or to alter mood and participants were aware that personal preference was important in selecting their music:

> Different music agitates different people. You really have to know what is good for you. Um, yes. I don't really know what's good for me but I do enjoy sort of calming music but I can't bear sometimes music that's too deep like when you hear the rain drops pitter-patter or all that. That will annoy me. (Jenna)

Some found it helpful to listen to music that resonated with their emotional state even when feeling low (see previous section), while others would choose more cheerful music as they found this lifted their mood:

> 'Cos some people when they're not in the mood, they play music which actually would make me die if I were in their situation. 'Cos they feel like oh it suits them. But if I'm in a bad mood I'd rather play something positive. 'Cos then it helps me – it helps me lifting up my mood. (Holly)

While some found background music a helpful distraction which could improve mood, those who preferred to focus their attention closely while listening found background music aversive, particularly when they were engaged in another activity such as exercise. Again, personal choice of music was important:

> I dislike it intensely, for two reasons. The two sessions I've had [in a gym] with music – one session I don't like the choice of music and I sometimes feel that people who are choosing music for me are imposing music on me. (Ivan)

Another example of variability was between Jenna (see quote in 'loss of access'), who found listening to music less satisfying because she was unable to sit still, as she preferred to enjoy it, and Brian, who expressed pleasure in being able move around and indeed felt prompted to move, even a little, in response to music and found that this helped with managing his pain:

> Only problem with that, reading a book or even watching a film is that [when in pain] you've got to move around you see. You can't stay in one place. With the music you are moving around like this [moves as if listening to music] . . . I tend to move to the music and get involved.

Moving away from pain

Distraction from pain. The majority of participants identified that an important function of music was as a distraction from pain:

> It takes your mind off the pain. Pain's still there but it takes your mind off. I think. (Martha)

> I'm focused on the music and I wouldn't notice the pain as much . . . Like I say, a good drama on television or something like that is a distraction but my first choice is music. And that's not just for this interview, that is the truth. (Grace)

> [Pulls out a harmonica and starts to play] How about that one? I came across this quite by accident . . . and it's brilliant . . . so it's brought me in a big turnaround when I've started learning, picking out tunes I think I can play on that. And I've been totally involved in it. And it's a total distraction. And it all [the feeling of pain] goes. (Brian)

For Holly, this change in focus of attention felt like a shift in location of activity in the brain:

> What seems to happen to me is the pain, because you give attention to it, the pain starts leading. So it really takes [when listening to music] it's as though you've got a different bit of brain and that helps. (Holly)

Some people described a more active use of distraction, either by listening carefully or using a deliberate technique by choosing to focus on particular aspects of the music or performance, so music served as a competing stimulus to pain:

> Well I think when you've, well for a start it makes you think of something else if you're listening to music, rather than thinking about the pain and that really helps. And I do *really* listen. (Pat)

> I'm just thinking if I know the musician, I'm just trying to think like this and that about that person so it does distract me . . . I'm thinking 'Oh, I wonder is he still doing this kind of music' or just trying to visualize all the instruments – what sort of instruments am I hearing? Yes, I think the thing about it is that it just – it's in the background but at the same time it is like hypnosis. (Amy)

Distraction was also effective during physical activity:

> I don't notice it. I could be using joints that I don't normally use. (Brian)

While describing how distraction could help with pain, participants often mentioned associated benefits, such as improving relaxation and mood. The multiple effects of listening to music were elaborated by Grace:

> I think it's the distraction . . . and I think again it's the lift of the spirits . . . I'm not focused on pain, I'm focused on something different. But the music is the thing. (Grace)

Music as a cue to past experience. When participants were asked why they felt music was a good distraction from pain, they revealed that music could be a strong cue for memories. The associations laid down between particular music and memories could provide an opportunity for using

music to alter emotional state and, while for most this seemed an unconscious process, others such as Brian explained how they deliberately chose music to generate an altered emotional state:

> I think lots of music has memories. Um and if you're in a melancholic mood, you put something on that brings back good memories. But music can also make you feel very down, I think. Because you can relate back to music at some point in your life which involved something bad going on. (Brian)

These memories were described as helpful in managing chronic pain, one reason being that music was a powerful cue to memories of feeling good. Amy explained how music had the ability to help take her out of her current body and remind her of a time before pain:

> At the back of the mind it just triggers 'Oh what was I doing when I heard that song' you know? So um obviously you're not in this body in this pain so you have good memories and just temporarily I think that sort of like releases the pain a bit. (Amy)

For Grace, certain music could take her focus away from her pain by taking her back to a time when she was able to move freely and dance without pain:

> You know, 'cos that's taking me back. That's taking me back to the 20s. My 20s, not the 20s [laughs] . . . and the whole thing is just joyful, so the pain doesn't feature . . . yes, all the handsome young men, and the dances and all that. (Grace)

However, for Holly, the memory of moving freely to music was frustrating:

> It [listening to music] is helpful really but the frustration doesn't help. It's reminding me of what I used to be able to do. (Holly)

Out of a painful body. Music listening was able to distance the listener from present experience; Amy described how music could transport her back so strongly to memories of another time in her life before she had pain that it felt like an out of body experience:

> You . . . associate the music with whatever you know, you are at that stage in your life. So temporarily you're out of this body. It's just the mind listening to the music, so it's like out of body experience . . . obviously you're not in this body in this pain. (Amy)

Others felt that music could than carry them away from their pain, described as a very specific, distinctive and helpful experience where they felt distanced from their pain:

> I think [music], that really helps, and you can get sort of drifting, you can get carried away. (Pat)

> Again, I think the meditation and the music, yes. The calmness you see, of that and the going away, mentally. (Grace)

> It's something to take you away from where you are. Where your mind is. It can take you away from all the rubbish, music I find. And it can put you in a good place. (Will)

Music was felt by the listeners to be instrumental in taking them away from present unpleasant circumstances to 'a good place' and the mental state associated with this experience was calm and meditative.

Discussion

This study identified a number of ways in which people living with chronic pain reported that they were able to benefit from listening to music. Music could provide distraction from pain, uplift mood, console and comfort, aid relaxation, energize and act as a cue to movement and memories of a self before pain. Conversely, in some contexts it could cause irritation, agitation and distress. These findings suggest that there is potential for developing additional music-based self-management strategies that could be used alongside, or incorporated into, the evidence-based methods already adopted by people with chronic pain to improve their quality of life.

Reduced involvement with everyday activities is a common consequence of chronic pain (McCracken & Velleman, 2010) so it is unsurprising that lost enjoyment of music emerged as a theme in this study. This change was related to limitations resulting from chronic pain, both physical (inability to sit for long periods) and cognitive (reduction in concentration). It was apparent that participants had not been aware of this loss before taking part in the interviews and how, by reflecting on their experiences, they began to consider how they might return to listening to music and the ways in which this could improve pain experience. This finding is supported by the observation of Batt-Rawden and Aasgaard (2006) that the process of selecting, listening and responding to different types of music could heighten awareness of the most helpful music for self-care in people with long-term health problems. Raising awareness of the potential for the benefits offered by music listening could be introduced through discussion with healthcare workers and by developing written guidelines based both on previous research and on the information gathered in this study.

The positive responses to music identified – that is uplifting, joyful, energizing, soothing, comforting and relaxing – all have the potential to be used as effective pain management strategies and will be considered in turn. There are several elements to the responses identified and categorized in the themes according to whether their valance is positive or negative. For discussion, the impact of these responses on the experience of pain will also been broken down into effect on emotional and physical dimensions of pain experience, while acknowledging that these are interconnected.

There is a wealth of evidence that mood is significant in chronic pain (Corbett et al., 2007; Herr, Mobily, & Smith, 1993) with recent reports (Chronic Pain Policy Coalition, 2007) placing as many as 25% of people with chronic pain as significantly depressed. Participants in the present study spoke of how music could lift their spirits when they were feeling low, helping them tackle negative emotions. Certain music was identified as particularly effective in improving mood and was selected accordingly: first, music preferred by and familiar to the individual; second, music with specific qualities, for example of tempo, rhythm, volume and tone; and third, music with lyrics perceived as appropriate to the situation. It was also possible to affect mood by recognizing and identifying with the emotional state of the performer. This process was experienced as cathartic when negative emotions were felt to be transferred to the performer who, by 'suffering' on behalf of the listener, allowed emotional release. Some participants deliberately selected music based on their current mood, therefore actively moderating their emotional state.

While there is some evidence that music can benefit mood (Chan, Chan, Mok & Kwan Tse, 2009; Choi, Lee, & Lim, 2008) including for adults with chronic pain (McCaffery & Freeman, 2003; Siedliecki & Good, 2006), a recent review of music therapy for depression (Maratos, Gold, Wang, & Crawford, 2008, p. 2) concluded that 'it is not possible to be confident about its

effectiveness'. There is evidence that music can have a direct impact on immediate emotional state but more research is needed to examine its potential to improve mood in the longer term.

Positive emotional experiences, particularly those which are recent and frequent, are associated with increased self-reported psychological well-being (Diener, Lucas, & Scollon, 2006). This is supported by Mitchell et al.'s (2007) reported association between frequent music listening and better quality of life. Intentional and goal-directed activity that results in positive emotional experiences appears more likely to result in improved reported subjective well-being over time (Sheldon & Lyubomirsky, 2006). In the present study, although some people described how they deliberately used music to improve their mood, few did this intentionally and several had abandoned listening to music, an activity they had previously enjoyed before the onset of chronic pain. This suggests that, if people with chronic pain could be helped to develop individual and deliberately implemented, goal-directed strategies for using music to provide positive emotional experiences, this could offer lasting improvement in subjective well-being.

In addition to uplifting spirits, music was observed to provide soothing effects, including muscular relaxation and inducing a calm state of mind. Whilst the efficacy of relaxation as an intervention for chronic pain is still debated (Carroll & Seers, 1998), some studies have found it to be effective (e.g., Dulski & Newman, 1989, as cited in Carroll & Seers, 1998) and it remains a common component of pain management programmes. Participants of the present study stated that the muscular relaxation provided by music helped with their chronic pain and this relaxing effect was felt to be particularly helpful during exercise. There was also a suggestion that, when pain was severe, music, especially if loud with a repetitive beat, could be irritating and overwhelming.

All participants reported that music could successfully distract the listener from their pain, confirming the findings of the survey conducted by Mitchell et al. (2007). A number of commonly used pain management techniques involve manipulation of attention (Morley, Biggs, & Shapiro, 2004), based on the assumption that the perception of pain is a capacity bound process; if one is able to focus on something other than the experience of pain, less cognitive resources will be available to process the sensory and emotional aspects of pain. Although evidence for the limited capacity model has been provided by a number of studies (e.g., Johnson & Petrie, 1997; Tracey et al., 2002), unequivocal support has not been found (McCaul, Monson, & Maki, 1992). Distraction appears to work in some settings but not others. Rhudy and Meagher (2001) proposed that the emotions evoked by stimuli have the potential to inhibit/augment pain depending upon their valence and arousal. Roelofs et al. (2004) proposed that distraction might only be an effective pain management strategy when the stimulus is emotionally relevant to the individual, as such stimuli can capture attention more strongly. This study provides some support for these theories as music was consistently described as a particularly 'powerful' stimulus and, moreover, one that could provoke both positive and negative responses depending upon context. The most effective music for distraction shared characteristics with that most likely to evoke a strong emotional response. All participants mentioned the use of music as a distraction from chronic pain, which suggests that currently used attentional strategies could usefully be adapted to include musical elements – for example, the addition of music to imagery or as the focus for mindful meditation.

Mitchell et al. (2008) proposed two main theoretical explanations for the impact of music on pain, the first being distraction, through both cognitive and emotional engagement, and the second being enhanced feelings of control. Although this study supports the former, no participant referred directly to control as a construct; rather, the observation was made that, although

music provided an effective distraction, the 'pain was still there'. Current theoretical models guiding the development of effective therapeutic strategies for managing chronic pain do not view control as a helpful construct; indeed, McCracken (2008) has stated that 'in many cases of chronic pain, at least some of the time, control is not the solution but the problem'. Although in acute pain settings control may still be a useful construct, in chronic pain, strategies which incorporate the use of music to help the individual work towards the goals of 'third wave' cognitive behavioural therapies such as more accepting and 'mindful' attitudes to pain are likely to offer greater therapeutic potential. Several participants described how listening to music could allow a state of mindful awareness that altered their perception of negative aspects of pain experience.

Graduated exercise programmes are widely used with people who have become disabled by chronic pain to overcome fear and to increase confidence in movement, to increase range of movement and thus enable a return to valued activities. Music is widely used in sport and exercise settings to increase enjoyment and motivation and enhance performance (see Karageorghis & Terry, 2008). Participants in this study reported that music was a cue to movement and that exercise was more enjoyable and interesting when accompanied by background music. Music also improved relaxation during exercise and motivation to continue exercising. However, rather than synchronize movement with the musical tempo, a method commonly used to maintain running speed, participants were aware of the need to pace themselves and move at a speed comfortable to them, so reported using music more as a general motivator. In a recent study, Kwan and Bryan (2010) found that, when healthy individuals showed an increase in positive affect during an exercise session, they were more likely to voluntarily exercise in the following three months. Thus there are a number of ways in which people with chronic pain may be able to use music effectively during exercise.

Music was reported by some as a powerful cue for context-dependent memory capable of evoking both positive and negative emotions associated with similar music in the past. For some, these were positive memories of a self before pain, of a body without pain. There is a considerable body of evidence for the damaging effect of chronic pain on self-identity and self-image, a strong relationship between enmeshment of the self and pain being associated with worse adjustment to pain (Morley, 2008, p. 28; Morley, Davies, & Barton, 2005). DeNora (2000) has suggested that music can be used to assist the reflexive process of forming a continuous sense of self-identity. Some people with chronic pain experience a dichotomy between their present and past selves (Snelgrove & Liossi, 2009), and it appears that, for some participants in the present study, music may help to bridge this gap. For those who have abandoned music since having chronic pain, a return to listening could enhance communication with others, generate a sense of shared action or entrainment and help re-establish a self-identity apart from pain.

While there are positive reports on the efficacy of music therapy for chronic pain (de l'Etoile, 2009), the therapeutic processes adopted are often unclear and the models used so different from the third-wave cognitive-behavioural models currently adopted in understanding chronic pain that it is difficult at present to integrate the approaches. However, recent developments in cognitive neuroscience have led to the formulation of a new 'biomedical' model of the music therapy process as applied to neurological disorders: neurologic music therapy (NMT; Leins, Spintge, & Thaut, 2009) seeks to explain the mechanisms underlying the use of music as a stimulus for neurological change to promote rehabilitation. This work echoes a similar body of research in chronic pain using brain imaging techniques which has also led to new treatments based on the potential for change offered by neuroplasticity (Moseley, 2004). The NMT model

may therefore lead to testable hypotheses which enable improved integration of the knowledge gained from research in both music therapy and chronic pain, leading to new music-based therapeutic approaches.

This study is the first to explore the lived experience of people with chronic pain regarding the impact of music upon pain experience in order to increase understanding of the various ways in which music could be used as an effective pain management strategy. Loss of involvement and enjoyment in music following the development of chronic pain was a new and common theme, so raising awareness of how music listening could be used purposefully as a pain management strategy is likely in itself to be beneficial. The results identified a promising range of functions of music listening in chronic pain management. Music could affect emotional state, at times powerfully, with the potential to uplift, console, energize or relax the listener and offer a sense of companionship. Conversely, it could upset or irritate. Music could act as a helpful distraction from pain, as a cue to movement and as a motivator to exercise. Finally, music could provide a link to memories of a self before pain.

Some of these functions have not been described before in the context of chronic pain and deserve further investigation. It would be helpful to examine further the circumstances in which music could worsen pain experience, to investigate the use of music as a cue to movement and a motivator during exercise and to analyze in more depth the impact of music on self-identity.

Music is easily accessible, relatively cheap and highly personal, making it ideal for people to adapt for their own use in their own time. The experiences of the participants in this report have allowed the identification of specific functions of music listening in chronic pain which could be of value as effective pain management strategies.

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