

**Title:**

**Group Singing Has Multiple Benefits in the Context of Chronic Pain: an Exploratory Pilot Study**

**Running head:** Group Singing for Chronic Pain Sufferers

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**Abstract**

This paper reports findings of a pilot singing intervention to assist people living with chronic pain. Pain Management Clinic out-patients participated in 10 weekly group singing sessions. Benefits of the intervention and its impact on participants' (N=4) experience of pain were explored qualitatively. Three main themes comprising over 20 separate codes indicated physical, psychological and social dimensions associated with the intervention. People with chronic pain identify multiple benefits from participating in a group singing program. Group singing in chronic pain settings has multiple benefits; and can be a beneficial adjunct to conventional pain management care and nursing, which may positively complement clinical outcomes.

**Keywords**

Chronic Pain, Group singing; Wellbeing; Quality of life; Bio-psycho-social pain model

**Key Practice Points:**

- Group singing can provide a multiple benefits for chronic pain patients.
- Group singing, a non-invasive, non-drug approach, could positively complement clinical outcomes.
- Group singing can be added to existing nursing care plans.

## 1. Introduction

### Chronic Pain

Pain which persists beyond the expected natural healing time of tissue damage (over three to six months) or, in some cases, without obvious injury or damage to the body is defined as chronic or persistent pain (National Institute of Neurological Disorders and Stroke, 2018; The International Association for the Study of Pain, 1986). It has been estimated that 20% of the world's adult population suffers pain, with a further 10% newly diagnosed with chronic pain each year (Goldberg & McGee, 2011). Persistent pain can impact on every aspect of daily life and can lead to job loss, reduced social life, depression and anxiety (Walker & Sofaer, 1998). Individuals with persistent pain experience reduced quality of life and often belong to socially disadvantaged groups in our community (Blyth et al., 2001, The U.S. FDA's Patient-Focused Drug Development Initiatives, 2019).

People with persistent pain have noted that pain brings significant changes into their everyday life and that it is difficult for them to explain their pain experiences to others (*"the confinement of persistent pain"*), including healthcare providers (Nilsen & Elstad, 2009). Further, women with fibromyalgia (widespread, persistent pain) have reported their condition as unbearable, overwhelming, aggressive and unpredictable and highlighted that persistent pain had a significant impact on their daily life (Juuso, Skär, Olsson, & Söderberg, 2011). Clearly for many, maintaining daily activities and fulfilling their roles while managing pain can be *"hard work"* (Ong, Jinks, & Morden, 2011).

The bio-psycho-social pain model posits that biological, psychological and social factors contribute to the chronic pain experience (Butler & Moseley, 2013; Gatchel, Peng, Peters, Fuchs, & Turk, 2007). Individuals experience pain differently, depending on each of these factors, physical factors, psychological factors, sociocultural context, plus the "meaning" ascribed to the pain, and attitudes towards pain (Turk & Okifuji, 2002). This bio-psycho-social model provides a holistic understanding of such complex interactions and indicates treatments of relevance to pain management care and nursing, which address a range of psycho-social factors as well as biological deficit or dysfunction.

### Singing for People with Chronic Pain

People in every culture sing from an early age. Singing engages the body, including the vocal cords, facial muscles and respiratory system, the mind (feelings and thoughts), and is

often a social activity. With the capacity to activate physical, emotional and social connections, singing can positively impact on quality of life, including for individuals who suffer from chronic health conditions. People with chronic, deteriorating respiratory conditions (such as Chronic Obstructive Pulmonary Disease and Cystic Fibrosis) have reported enhanced quality of life by participating in group singing programs (Bonilha, Onofre, Vieira, Almeida Prado, & Martinez, 2009; Irons, Kenny, McElrea, & Chang, 2012; Irons, Kuipers, & Petocz, 2013; Irons, Petocz, Kenny, & Chang, 2016; Lord et al., 2010; Lord et al., 2012). People with long-term mental health problems have reported improvements in quality of life after taking part in group singing (Clift, Manship, & Stephens, 2017; Williams, Dingle, & Clift, 2018), as have those living with neurological conditions such as Parkinson's and dementia (Abell, Baird, & Chalmers, 2017; Camic, Williams, & Meeten, 2013; Stegemöller et al., 2017). Singing has been found to stimulate an increase in neurochemicals in the body (particularly oxytocin), which is associated with bonding and social affiliation (Kreutz, 2014). As such, it may promote overall wellbeing (Daykin et al., 2018), including positive social feelings such as friendship and empathy (Clift & Hancox, 2001; Clift et al., 2010).

Group singing has previously been trialed with patients suffering from persistent (non-cancer related) pain. Kenny and Faunce randomized patients at an Australian multidisciplinary pain clinic into either group singing or listening to music while exercising. Participants in the group singing program demonstrated enhanced active coping skills. Although the study had a limited number of participants (n=12 in singing group) and short intervention time (3 weeks), the findings were encouraging (Kenny & Faunce, 2004).

An American study investigated the effects of Vocal Music Therapy in African-Americans with chronic pain (n=23). After an 8-week intervention, which included vocal improvisations and singing circle songs, participants in the singing group demonstrated improved pain self-efficacy and reduced pain interference, compared with the wait-list control group (Bradt, Norris, Shim, Gracely, & Gerrity, 2016). Intervention participants reported that singing helped them manage their pain and stress, brought about a better sense of being understood, and helped them gain a sense of social support from other participants. Similarly, semi-structured in-depth interviews conducted after a group singing intervention for persistent pain sufferers in the UK noted reduced pain experience, improved emotional wellbeing, enhanced social inclusion, and a sense of personal discovery/growth (Hopper, Curtis, Hodge, & Simm, 2016).

Such evidence for the benefits of singing for people with chronic pain is encouraging. In light of concerns over the efficacy of pain medications (Kissin, 2013), and recent reports of increased death associated with prolonged opioid use (Sleeman & Strang, 2018),

exploratory studies of the benefits of non-pharmaceutical interventions are warranted. Group singing is such an intervention, as a potentially safe, adjunct treatment, potentially suited to pain management nursing contexts, which may enhance quality of life in individuals with persistent pain. However, the specific dimensions of the benefits of group singing have yet to be clearly elaborated.

The current pilot study explores the benefits of group singing in a multidisciplinary chronic pain clinic in Australia, where group singing is not yet an established component of the multidisciplinary pain management program.

## **2. Method**

### **2.1. Participants**

Adult patients (>18 years old) who were attending the Persistent Pain Management Service (PPMS) at the Princess Alexandra Hospital, Brisbane, Australia, were invited to participate in a group singing program. The PPMS program includes consultations with pain physicians, pain education provided by nursing staff, and allied health therapies, such as psychotherapy physiotherapy and occupational therapy. Patients with limited comprehension of English, significant cognitive impairments, or severe or poorly managed psychological co-morbidities were excluded. Initially, 15 patients indicated an interest in the group singing program. However, due to their day time commitments, only four participants completed the 10 week program (attended a minimum of eight sessions) and took part in the semi-structured in-depth interviews. All four participants (female=3, male=1) presented with persistent pain (back pain, fibromyalgia). Two female participants in their thirties were unemployed, while the other female and male participants in their sixties were retired. Their duration of chronic pain varied between two and 12 years. The male participant had previous experience of singing in a choir (> a year), and a female participant also previously attended a church choir (five years).

### **2.2. Ethical Considerations**

The current study was approved by the University Human Ethics Committee (GU Ref No 2016/382). All participants were provided with a study information sheet, and asked to sign a consent form which outlined their voluntary participation, confidentiality, and the guarantee that they could withdraw any time, without impact on their usual treatment.

### **2.3. Singing Program**

A specially developed, weekly one-hour group singing program was delivered by the first author, who is a singer, qualified music therapist and experienced researcher in the field (Irons et al., 2012; Irons et al., 2013). The program encouraged participants to sing and to become aware of their singing voice, their breathing, and their body as a musical instrument. Each weekly group singing session began with a 5-minute relaxation with live guitar music playing. Breathing and vocal warm-up exercises followed. Participants were then engaged in singing songs that they chose; accompanied by a professional guitarist. Two volunteers (a male medical student and a female retiree) were present at the sessions. The facilitator demonstrated the correct application of all exercises and adjusted the program to the group's pace. A non-judgmental and supportive environment was fostered, so that participants felt safe to explore their singing voice. When group members had sufficient confidence in singing their favorite songs (from the fifth session), the group singing was recorded and later made into a CD.

#### **2.4. Study design – Singing Program and Semi-structured In-depth Interviews**

To explore participants' perspectives and experiences of group singing, individual in-depth interviews were conducted by allied health staff of the clinic. The interviewers were familiar both with chronic pain and patients with chronic pain, and had experience of interview research methods, but did not take part in the weekly group singing sessions. Participants were informed that the interviews were confidential and would not affect pain clinic treatments in any way. The semi-structured interview questions were drafted based on the bio-psycho-social pain model (Gatchel et al., 2007), to ensure interviews covered aspects of health and wellbeing and aligned with the ethos of patient-centered care (Richards, Coulter, & Wicks, 2015). The interview questions also investigated participants' satisfaction with the singing program, since this was a new initiative at the pain clinic. All interviews were conducted at the pain clinic and recorded using a digital audio recorder (Zoom H4N Pro Handy Recorder) and transcribed verbatim. (Appendix 1. Semi-structured interview questions)

#### **2.3. Data Analysis**

Interview transcripts were analyzed using thematic analysis (Braun & Clarke, 2006), comprising the following steps. Two authors (JYI; PK) became familiar with the data through reading and re-reading the transcripts. The researchers independently identified passages in the transcripts that reflected similar ideas. Codes to describe these ideas were then generated. The researchers then reviewed and more clearly defined the codes, which were then categorized into physical, psychological and social dimensions. Since the interviews were constructed by the researchers in light of the bio-psycho-social approach, data were

conceptualized deductively. All authors took part in discussions about reviewing and defining codes. Data analysis followed the recommendations of the Consolidated Criteria for Reporting Qualitative Studies (COREQ) (Tong, Sainsbury, & Craig, 2007), as well as similar procedures of an in-depth study with chronic pain patients (Twiddy, Hanna, & Haynes, 2017).

### **3. Results**

Across the three main themes, 17 codes were identified describing key aspects of chronic pain patients' experience of the group singing program. Table 1 provides an overview of the themes and codes. One or two representative quotes is provided for each code.

<Table 1 here>

The majority of codes were related to psychological health and wellbeing. Participants reported that they enjoyed the singing program, gained a sense of empowerment, increased confidence and that their negative feelings decreased. Further, through singing, participants felt that they could release tensions, which in turn reduced their focus on or experience of pain. Some personal growth was also noted as a result of participating in group singing, and participants commented that they learnt something new. Having a purpose, motivation and gaining new perspectives were also identified as key outcomes of the singing program.

Regarding the suitability of the intervention, Table 2 shows that overall, responses were mostly positive.

Singing together in a group of people who have a similar condition also brought special meaning to the group members. They reported enjoying singing together, sharing their favorite songs, through which they felt that they could connect to others. Making new friends through singing was also perceived as highly beneficial.

<Table 2 here>

Further, participants reported that they considered the breathing exercises, which were part of each session, to be helpful. They reported being distracted from pain while singing in the group with one commenting it was 'the only time you don't have pain'.

### **4. Discussion**

Through this brief qualitative enquiry, we have explored chronic pain sufferers' experience of singing and its impact on their health and wellbeing. Participants of the weekly group singing program reported benefits in physical, psychological and social health and wellbeing, with the majority of comments related to aspects of psychological wellbeing. These findings

reaffirm the outcomes of previous singing studies. Engaging in regular group singing has been reported to have positive impacts on physical, mental and social health in mental health service users (Plumb & Stickley, 2016) as well as community members of amateur singing groups (Clift & Hancox, 2001, 2010; Clift et al., 2010).

The key outcome of the current study is the breadth of issues identified under the three themes of psychological, social and physical health and wellbeing (Table 1). While specific benefits of singing and group singing have been identified previously (Clift & Hancox, 2001, 2010; Daykin et al., 2018; Hopper et al., 2016; Irons et al., 2013; Kenny & Faunce, 2004; Kreutz, 2014; Skingley & Vella-Burrows, 2010; Stewart & Irons, 2018), the current study provides a much richer picture as it highlights 17 dimensions within a bio-psycho-social framework. Chronic pain is understood as having dynamic inter-relationships between the biological process and psychosocial factors, all of which contribute to the experience, maintenance and exacerbation of pain (Morasco et al., 2014). Moreover, this framework suggests that to achieve optimal health outcomes for chronic pain patients, it is necessary to deal with the contributions of each of these bio-psycho-social factors (Flor & Turk, 2011). This study indicates a parallel between what a group singing intervention can offer and what an effective chronic pain treatment should contain. Currently, multi-disciplinary approaches to chronic pain have been adopted by clinicians, nursing and allied health professionals, where the multi-faceted and multi-layered characteristics of persistent pain can be effectively addressed.

Our data indicate certain specific advantages of a group singing intervention: it has the capacity to influence physical, psychological and social aspects of chronic pain, which seem to be interrelated: singing can encourage greater use of the whole respiratory system and provide beneficial physical exercise, which can result in a range of positive feelings, such as increased self-esteem, confidence, motivation and empowerment; and singing can also be an enjoyable social activity, which provides bonding experiences and positive social interaction. Previous findings that music has been found to relieve stress, anxiety and depression in individuals with pain (Bernatzky, Strickner, Presch M., & Wendtner, 2012), and may reduce stress, anxiety and pain (Nilsson, 2008), were reflected in our participants' comments, but the current study provides more detail to these physical dimensions. Similar to the findings in earlier research (Hopper et al., 2016; Bradt et al., 2016), in our study, participants described decreased pain intensity and being distracted from pain during and/or after singing. Group singing may activate endorphins (Dunbar, Kaskatis, MacDonald, & Barra, 2012), and reduce the use of pain killers (Hopper et al., 2016).

In support of studies noting psychological benefits (Hopper et al., 2016; Jensen, Stickley, & Edgley 2016; Kenny & Faunce, 2004), our participants reported gaining confidence,

developing new perspectives on life and less fear avoidance. They gained a sense of mastery, empowerment, motivation and established new positive connections with others. Further, social benefits described by our participants have been noted in previous studies (Bradt et al., 2016; Hopper et al., 2016), but our participants also commented that through singing together, they felt that they were less isolated, could connect to each other, and had greater enjoyment.

The implications of these findings are that future frameworks for group singing interventions and evaluations of such programs should recognize the breadth of these factors and seek to explore each aspect in greater detail.

In summary, our findings suggested that group singing enhances multiple areas of health and wellbeing. Recognizing that quality of life is defined as the subjective perception of physical, psychological, and social aspects of health and wellbeing that is embedded in a cultural, social and environmental context (WHOQOL, 1998), it may be suggested that group singing contributes to better quality of life in individuals with persistent pain.

#### **4.1. Implications for Practice and Research**

The current study suggests that group singing can be offered within a multi-disciplinary pain management approach. It was well accepted by patients, is relatively low-cost without known side-effects. Group singing is also a social program, with singing promoting social bonding (Kreutz, 2014; Pearce, Launay, & Dunbar, 2015; Pearce, Launay, MacCarron, & Dunbar, 2017). Peer support, being connected with others with the same health condition may help break 'the misery circle', where illness forces social isolation and social isolation worsens the illness (Monbiot, 2018).

For group singing to be effectively incorporated into pain management nursing and health care settings, a supportive environment is essential within the multi-disciplinary pain clinic. Well-structured singing sessions need to include the abdominal breathing method, vocal warm-ups and participants' preferred song singing. Songs containing long phrases can reinforce the abdominal breathing method, which may reduce stress and anxiety and increase a sense of relaxation. Participants' preferred songs were used in the current study, as a previous study showed that self-chosen songs are likely to decrease one's pain experience (Mitchell, MacDonald, & Brodie, 2006). When there is disagreement on repertoire amongst participants, the facilitator can regard all opinions and help encourage the group to learn from each other. Further, it is paramount that the singing facilitator provides an encouraging, supportive, non-judgemental approach to singing, so that everyone can

achieve a positive singing experience. In Hopper's study (2016), a person with chronic pain facilitated the singing program, while a music therapist delivered in Bradt study (2016), and singer/musician in the Kenny and Faunce study (2004). While Bradt (2016) and Kenny (2004) did not discuss the facilitator's roles, Hopper et al. (2016) indicated that the facilitator's own lived experience of pain had a positive impact on other choir members, as their own story could empower others and serve as a role model.

Moreover, it will be vital to develop and apply meaningful assessments of patient and program outcome. Given the popularity of group singing in community and health care settings (Clift et al., 2009), a validated and reliable assessment is required. The current study informs the development of future scales by outlining 17 key themes which characterize patient experience. While measures such as the Arts Observational Scale (ArtsObs) has been used to assess the benefits of arts-based program for patients (Fancourt & Poon, 2016), the current characterization of the experience of patients provides potential categories for the expansion of such scales, and for improving singing programs within pain management nursing and other health care settings.

The current study's findings provide a rationale for further exploration. More research using robust methodologies is needed. Future studies should also take into account the chronic pain patient's views on therapeutic singing being offered as part of their pain management program. Additionally, there is need for evidence of the effects of group singing on pain duration (short-, medium- and long-term), as well as severity (low, moderate and severe).

#### **4.2. Strengths and Limitations**

Based on the premise that constructed, subjective knowledge is true evidence (Hammarberg, Kirkman, & de Lacey, 2016), this pilot study presents valuable insights into the perspectives of participants in a group singing program for people with persistent pain. The current study included only a small number of participants, who were all Caucasian, and who were willing to participate with some degrees of expectations of positive outcomes for themselves. The study was for a short-term period of 10 weeks. From our program evaluation (Table 2), participants also commented that group singing could be an ongoing activity. Our study was conducted at an out-patients pain clinic, which meant that patients who had access to our program were going through medication changes, numerous medical tests (e.g., blood tests, MRI, etc.) and experiencing pain flare-ups or exacerbations. This may have contributed to the low participation rate. Finally, we acknowledge that researchers' background and their understanding of singing may have played a role in constructing

knowledge in this study, however, to minimize any possible bias, all interviews were conducted with independent and experienced health professionals, who did not take part in the singing sessions.

## **5. CONCLUSION**

Although limited in scope, this pilot study suggests the benefit and potential of extending group singing as an adjunct to comprehensive pain management plans, and consistent with nursing care. Individuals with chronic pain experienced a broad range of health and wellbeing benefits from a group singing program delivered in an out-patient Persistent Pain Management clinic, which included nursing care. Based on the patients' perspectives, group singing was well received and reported to have positive impacts on their quality of life. The underlying mechanism of a group singing intervention can be understood as consistent with the bio-psycho-social pain model, where the physical, psychological and social aspects of experiencing pain are interlinked and interdependent. Based on the present findings, further clinical studies are needed to quantify the effects of group singing on chronic pain and to identify optimal 'dose' of singing for chronic pain management.

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