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A narrative literature review of the therapeutic effects of music upon childbearing women and neonates



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ABSTRACT

Keywords:

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Therapeutic effects of music are well recognised within the literature, with benefits for a variety of health problems documented. This narrative review summarises benefits in terms of reducing stress, anxiety, labour pain and depression in childbearing women. For neonates, music has been shown to reduce number of days to discharge, reduce pain response behaviours, increase weight gain, improve Brazelton scores, improve parent/infant intimacy, improve oxygen saturation, increase formula intake, stabilize vital signs and increase parental reports of calmed infants. The main criticism of the studies reviewed is lack of categorisation of the particulars of the variables within the music that directly influenced outcome variables. A recommendation is made that a music package be developed and relationships with variables rigorously evaluated. The validated product may then be made available for use. Since evidence supports advantages from listening to music, it is suggested that maternity professionals use it in more creative ways.

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1. Introduction

The therapeutic effects of music are well recognised within the literature, with benefits for a variety of health problems documented [1,2]. With view to developing a study designed to measure the effects of music upon childbearing women's mental health, a structured narrative review of the literature was conducted to justify the aim of the proposed study.

People who listen to music that they enjoy have been shown to experience increased levels of natural serotonin (a monoamine neurotransmitter) that is used in the manufacture of some contemporary antidepressant medications [3,4]. Serotonin creates a more relaxed physiological state, whereas stress can cause a fight/flight response. Listening to music has been shown to counteract the physiological stress reaction, with response release acetylcholine lowering heart rate, blood pressure and enhancing blood flow to the vital organs [5,6]. Women who experience excessive stress are at risk of developing mental health problems, with vigilance to avoid, recognize and treat a main request of the Centre for Maternal and Child Enquires (CMACE) report [7]. Since the majority of

relaxants and antidepressants cross the placental barrier to effect the fetus, this justifies an exploration of alternative non-pharmaceutical methods of reducing stress in childbearing women.

At times it would benefit childbearing women to accomplish a relaxed state; for example, when blood pressure has breached normal range, when stressful interventions like External Cephalic Version (ECV) or amniocentesis are required, or simply to reduce stress caused throughout a busy day. To identify the evidence-based effects that music interventions can have upon maternal and neonatal outcomes, the research question in this study asked; what are the therapeutic benefits of childbearing women and neonates listening to music?

2. Method

A narrative review of the literature was considered the appropriate method to answer the research question. This approach was chosen because the author wished to include both quantitative and qualitative methods, with implementation of a stringent hierarchy of evidence excluding valuable studies. The decision was to capture a broad variety of literature using an approach suggested by Baumister and Leary [8], which sanctions inclusion of the full spectrum of research methods [9]. Taking this approach, a narrative review of the literature was undertaken between December 2013 and March 2014, which involved searching several electronic databases:

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- Cochrane Library
- JSTOR Music Collection
- NHS National Library of Health
- Science Direct
- Web of Knowledge

A combined free-text and thesaurus approach was adopted to identify relevant literature for inclusion. The following keywords were used:

- Anxiety
- Childbirth
- Health
- Pregnancy
- Stress reduction

The above search terms were combined with:

- Music
- Therapy

3. Evidence of effects music can have upon maternal and neonatal outcomes

Post gathering of the main body of literature, the papers were grouped in order of appropriateness. The main strengths and limitations of each paper were summarised. The initial review identified 58 papers, which on closer examination relative to the research question was reduced to 16. During reading and appraisal several categories emerged. These included the effects of music upon:

- Maternal stress and anxiety
- Maternal depression
- Maternal mood
- Labour pain
- Neonatal outcomes

What follows is the summarised findings from the papers scrutinized, followed by an overall discussion about the general rigour of the research methods used.

3.1. Effects of music upon maternal stress and anxiety

Two researchers studied the effects of music upon levels of stress and anxiety experienced by childbearing women [10,11]. Ventura et al. [10] played music to combat stress experienced by pregnant women awaiting amniocentesis. The music intervention contained a baseline which matched the human heartbeat (tempo = 60–80 bpm), was middle-low pitched, low volume and held a rhythmic steady melody, as advocated by Schorr [12]. Childbearing women ($n = 154$) were randomly assigned to 3 groups. Group (1) experienced the music intervention for 30 min, Group (2) read magazines, and Group (3) sat quietly in the waiting-room. Group (1) experienced the largest decrease in cortisol levels and state anxiety ($p < 0.001$). An insight acknowledged in the Ventura paper [10] that holds relevance for further study design, is that conditions for relaxing in a clinic may not be reproducible in the home. In addition, women taking relaxant medications may stray from an average response to calming interventions, and so this should be an exclusion criteria in further studies.

A further RCT by Liu et al. [11] measured the effects of music therapy on childbearing women's anxiety levels during labour. Taiwanese primigravidas ($n = 60$) were randomly assigned to 2

groups. Group (1) ($n = 30$) listened to the music intervention, and Group (2) ($n = 30$) received routine care. Using Visual Analogue Scales (VAS), Group (1) experienced significantly lower anxiety during latent phase (2–4 cm cervical dilation), with no significant difference between groups observed during active phase (5–7 cm). One limit of the Liu et al. [11] study is that participant preference in music purchase was not explored, with this a consistent feature of most of the studies in this review.

3.2. Effects of music on maternal depression

The Scottish Intercollegiate Guidelines Network (SIGN) estimates that 100–150 per 1000 childbearing women experience Post Natal Depression (PND) [13], with high levels of stress and anxiety during the antenatal period a precursor to developing antenatal depression [14].

Maratos et al. [3] conducted a Cochrane review that focused on 5 studies which implemented music as a variable. Four studies reported reduced symptoms of depression in the music therapy groups compared with those who received standard care. Upon questioning, participants viewed that the music therapy was an acceptable treatment for their depression, with improvements in mood also observed in neonates [15]. Maratos et al. [3] concluded that the studies reviewed were underpowered in terms of numbers of participants. Nonetheless, they showed short-term improvements in frame of mind that exceed that achieved by routine care alone. Based upon low participant drop-out rate, the music therapy was considered to be a well-tolerated treatment. Maratos et al. [3] concluded that overall quality ratings of the studies included was moderate to poor. They state that larger more rigorous studies are required which recruit sufficiently powered larger sample sizes and incorporate economic evaluation of the cost-effectiveness of treatment in comparison to standardised remedies for depression.

3.3. Effects of music upon maternal mood

Several authors have reported that singing enhances the mood of childbearing and postnatal women [16,17]. For example, Carolan et al. [16] explored the experiences of women who sang lullabies to their unborn and new born infants. During 4 group sessions with musicians, primiparous women ($n = 6$, >32 weeks gestation) sang 3 lullabies to their infant at least once a day prior to and post birth. Three months post-partum, qualitative semi-structured interviews were conducted to evaluate participant experiences of the music intervention, with all 6 reporting that singing lullabies was enjoyable, emotion provoking, soothing and calming. Participants also recounted that the intervention increased their ability to express fears and anxiety. Ashby et al. [17] testimony that positive mood arousal is affected by increased levels of dopamine produced in the ventral tegmental area of the brain, which enhances endorphin release into the bloodstream. Limitations of the Carolan et al. [16] study was the extremely small sample size, with recruitment mainly from women of advanced maternal age and higher educational status, who are more likely to participate in health promoting activities [16]. It is recommended that future studies stratify social background of the populations they sample.

3.4. Effects of music upon women's experiences of labour pain

Sixty percent of primigravidas and 40% of multiparas report experiencing acute labour pain [18]. The gate control theory has been used to explain physiological moderation of pain [18], with Melzack claiming that 'closing the gate' located in the dorsal horn of the spinal cord moderates pain experience through inhibiting neurone impulses [18]. In alternative medical contexts, music has

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