The Arts in Psychotherapy 58 (2018) 42–52

Contents lists available at ScienceDirect

The Arts in Psychotherapy

journal homepage: www.elsevier.com/locate/artspsycho

Research Article

Music therapy song writing with mothers of preterm babies in the Neonatal Intensive Care Unit (NICU) – A mixed-methods pilot study

Mark Ettenberger[a,b,c,*], Yenny Marcela Beltrán Ardila[a,b]

[a] SONO – Centro de Musicoterapia, Cra. 16A#86A-02, Bogotá, Colombia
[b] Hospital Centro Policlínico del Olaya, Carrera 21 No. 22-68 sur, Bogotá, Colombia
[c] Universidad Nacional de Colombia, Carrera 45 No. 26-85, Bogotá, Colombia

ARTICLE INFO

Keywords:
Music therapy
Song writing
Preterm infants
Neonatal Intensive Care Unit (NICU)
Bonding
Mixed-methods

ABSTRACT

This study presents the results of a mixed- methods pilot study measuring the impact of music therapy song writing on bonding, depression, anxiety levels and mental wellbeing in mothers of preterm babies in a Neonatal Intensive Care Unit (NICU) in Colombia. The study included 15 mothers and their medically stable babies born between the 28th and 34th week of gestation. The quantitative data were collected with the Mother-to-Infant Bonding Scale (MIBS), the Short Warwick-Edinburgh Mental Well-Being Scale (SWEMWBS) and the Hospital Anxiety and Depression Scale (HADS). The qualitative data was collected with semi-structured interviews and was analysed using thematic analysis. The quantitative results indicate favourable effects of music therapy song writing on all outcome measures. While it was not aimed to achieve any statistical significant differences due to the small sample size, the data suggests that music therapy song writing might be especially effective for mothers at risk for an impaired bonding and for mothers with higher anxiety levels or depressive symptoms. The qualitative analysis showed that composing welcome songs for their preterm babies can be a way for parents to creatively express their emotions and thoughts during their baby's hospitalization and can promote relaxation, parental skills and a successful parent-infant communication.

Introduction

The construction of positive emotional bonds between parents and their newborn is the basis for a nurturing parent-infant relationship and essential for the baby's long-term development (Edwards, 2011; Music, 2011). For both parents and their baby, this process begins already during pregnancy. As its development matures, the foetus begins to recognize and becomes familiar with the different internal and external stimuli that form part of the intrauterine environment (Barudy & Dantagnan, 2013). The expectant mother on the other hand nurtures her ideas about the baby with fantasies and desires, which – as the baby grows and when she starts to feel his/her movements in the womb – become an important part of maternal-foetal attachment (Brandon et al., 2009; Lartigue, 1994; Malm, Hildingsson, Rubertsson, Radestad, & Lindgren, 2016). Although much less is known regarding paternal-foetal attachment, also fathers undergo both psychological and physiological changes during pregnancy and build up internal representations of their unborn baby (Cataudella, Lampis, Busonera, Marino, & Zavattini, 2016; Vreeswijk, Maas, Rijk, & van Bakel, 2014; Yu, Hung, Chan, Yeh, & Lai, 2012). For both parents, stimuli such as their voice and touch open a door for establishing a relationship with the baby before birth, either through the permanent interactions between each other or directly through the contact with the mother's womb (DeCasper & Fifer 1980; Gerhardt & Abrams, 2000; Marx & Nagy, 2015).

Preterm birth and the subsequent hospitalization of the baby in the Neonatal Intensive Care Unit (NICU) can interrupt this process and might threaten the continuity of the developing parent-infant relationship. The fluctuating health status of preterm babies, restrictions in visiting, holding or touching their baby and the highly technological NICU envirnoment can limit family interactions that already started during pregnancy (Guerra Guerra & Ruiz de Cárdenas, 2008). Increased parental stress, anxiety, the disruption of normal family life and the elevated economic costs of hospitalization add to these problems and can compromise a normal transition into parenthood (Davis, Edwards, Mohay, & Wollin, 2003; Lindberg, Axelsson & Öhrling, 2007; Rutter, 1995; Shah, Clements, & Poehlmann, 2011). Furthermore, the unexpected delivery and the emergency situation in which most preterm births take place can cause negative feelings in mothers and fathers of preterm babies (Ionio et al., 2016). Combined, these challenges can

* Corresponding author at: Calle 92#18-62, apto. 501, 110221, Bogota´, Colombia.
E-mail address: mark.ettenberger@gmx.at (M. Ettenberger).

https://doi.org/10.1016/j.aip.2018.03.001
Received 7 October 2017; Received in revised form 2 December 2017; Accepted 5 March 2018
Available online 12 March 2018
0197-4556/

potentially lead to the development of symptoms related to Post-traumatic Stress Disorder (PTSD) in parents in the NICU (Gondwe & Holditch-Davis, 2015; Jotzo & Poets, 2005; Stewart, 2009a, 2009b). This is important since PTSD can affect attentional and executive functions and makes it harder to form social relationships (Flaks et al., 2014).

Such a situation can make it difficult for parents to establish a secure and stable bond with their baby in the NICU and can affect parental sensitivity towards their baby's communicational cues (Zelkowitz, Na, Wang, Bardin, & Papageorgiou, 2011). This is crucial, because parental sensitivity is a critical factor for attachment security (De Wolff and van IJzendoorn, 1997), with less parental sensitivity being related to more insecure attachment styles (Evans, Whittingham, & Boyd, 2012). Insecure styles of attachment (i.e. avoidant, resistant, disorganized) are on the other hand associated with less peer competences, more externalizing problems, and increased mental health problems later on in life (Groh, Pasco Fearon, van IJzendoorn, Bakermans-Kranenburg, & Roisman, 2017; Mikulincer & Shaver, 2012). Taking into account that preterm babies are already at higher risk for developmental, cognitive and behavioural impairments due to their early start in life (Simmons, Rubens, Darmstadt, & Gravett, 2010), supporting the evolving relationship between parents and their baby in the NICU is thus of utmost concern.

Various care models applied in NICUs such as Family-centred Care (FCC) (Gooding et al., 2011; Kuo et al., 2012) or Kangaroo Care[1] (KC) (Martin, Fanaroff, & Walsh, 2015; Tamez & Silva, 2008) focus their interventions on the parent-infant relationship. Although the efficacy of early parenting interventions in the NICU is discussed conversly in the literature (Johnson et al., 2009; Spittle, Orton, Doyle, & Boyd, 2008), a recent meta-analysis of programs that focused specifically on the parent-infant relationship showed positive effects on anxiety levels, depressive symptoms and self-efficacy in mothers (Benzies, Magill-Evans, Hayden, & Ballantyne, 2013).

Over the last decade, also music therapy practice and research in the NICU shifted towards a more systemic view addressing both the medical and psycho-social domains of preterm babies and their families. This is reflected by an increased integration of caregivers to the music therapy interventions and by including parental outcome measures to the research designs (e.g. Cevasco, 2008; Ettenberger, Rojas Cárdenas, Odell-Miller, & Parker, 2017; Haslbeck, 2013; Loewy, Stewart, Dassler, Telsey, & Homel, 2013; Teckenberg-Jansson et al., 2011; Vianna, Barbosa, Carvalhaes, & Cunha, 2011 – for an overview, see Ettenberger et al., 2017). However, this shift makes it necessary to further investigate music therapy methods and techniques that specifically aim at caregiver and family participation and at fostering the early parent-infant realtionship in the NICU.

This pilot study reports the impact of music therapy song writing on bonding, mental wellbeing, anxiety levels and depressive symptoms in mothers of preterm babies in the NICU. It is the third study conducted in the same research institution and results from the need to thoroughly systematize our developing clinical practice and to pioneer new approaches in the field. While in the first study a variety of methods and techniques were used in working with both the parents during Kangaroo Care and with the preterm babies alone (Ettenberger et al., 2014), the second study focused on the active participation of caregivers through parental singing (i.e. *song of kin*, Loewy, 2015) during Kangaroo Care (Ettenberger et al., 2017). Simultaneously to these studies, in our on-going clinical work, song writing was increasingly offered for encouraging parent-infant bonding or during end-of-life care (Ettenberger, 2017a; Ettenberger, 2017b). The positive feedback of parents, who stated that composing songs for their babies helped them to express their emotions and motivated them to actively take part in the care of their baby, led to the design of this pilot study, which was conducted in partial fulfilment of the second author's M.A. in Music Therapy at the Universidad Nacional de Colombia. To our knowledge, it is the first study that investigates music therapy song writing in the NICU and hopefully adds to the growing body of knowledge in the field.

Method

Study design

This was a mixed-methods pilot study using concurrent triangulation[2] (Kroll & Neri, 2009; or 'embedded design', Andrew & Halcomb, 2009) and a within-subject repeated measures design.

Data collection

For the quantitative data collection, the participating mothers filled out the following three psychometric questionnaires before the first therapy session, during the music therapy process and after the last music therapy session:

- The Mother-to-Infant Bonding Scale – MIBS (Taylor, Atkins, Kumar, Adams, & Glover, 2005): The MIBS is a short self-evaluating bonding questionnaire consisting of 8 adjectives evaluating how mothers feel towards their baby, rated on a 4-point Likert scale (loving, resentful, neutral or felt nothing, joyful, dislike, protective, disappointed, aggressive). Since there is no Spanish version of the MIBS available, for this study the same translation was used as the one piloted in the two former studies conducted in the same research institution (Ettenberger et al., 2017; Ettenberger et al., 2014). The higher the total points of the MIBS, the greater the risk for an impaired bonding, with a maximum score of 24. A cut-off point of > 2 was suggested by Bienfait et al. (2011) as a risk indicator for an impaired mother-infant bonding in the NICU.
- The Short Warwick-Edinburgh Mental Well-being Scale – SWEMWBS (Stewart-Brown et al., 2009): The SWEMWBS is a shortened version of the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) initially developed by Tennant et al. (2007). The Spanish version was published by López et al. (2013) and by Castellví et al. (2014). The SWEMWBS consits of 7 items rated on a 5-point Likert scale with a maximum score of 35. A Higher score indicates a greater overall mental wellbeing.
- The Hospital Anxiety and Depression Scale – HADS (see for the Spanish version Herrero et al., 2003): The HADS consists of a 7-item anxiety sub-scale and a 7-item depression sub-scale rated on a 4-point Likert scale. The higher the total points of each scale, the greater the risk for a depressive or anxiety disorder, with a maximum score of 21 for each sub-scale.

The qualitative data was recollected with semi-structured interviews held with the participants after the last music therapy session. The data was analysed using thematic analysis, a method for identifying themes or patters within a data set (Braun & Clarke, 2006; Clarke & Braun, 2013). While both the quantitative and qualitative data was collected exclusively from the participating mothers, fathers and other family members (i.e. grandparents) participated actively in numerous music therapy sessions.

Participants

The participants were 15 mother-baby dyads, admitted to the NICU

[1] Kangaroo Care is a technique developed by Dr. Rey Sanabria and Dr. Martínez Gómez in Colombia in the late 1970s, in which the baby is put upright on the chest of the caregiver and covered with a blanket, providing skin-to-skin contact and thermo-regulation.

[2] A concurrent triangulation design involves the simultaneous collection of qualitative and quantitative data.

of the Centro Policlínico del Olaya (CPO) between August and October 2015. The ethics and research committee of the CPO granted permission for the study, which was conducted adherent to the ethics guidelines for research with human beings by the Ministry of Health of Colombia, resolution N°008430 of 1993 (Ministerio de Salud, 1993). The inclusion criteria were: a signed informed consent by the parents; medically stable preterm infants born between the 28th and 34th week of gestation; having initiated Kangaroo Care; and literacy of mothers. The exclusion criteria were: parents not willing to participate in the study; preterm infants with congenital abnormalities or cerebral lesions; preterm infants with mechanical ventilation, inotropic support, sedation or frequent episodes of apnoea; death of the baby during hospitalization; and illiteracy of mothers.

Research institution

The study took place at the Level III NICU of the CPO, a large hospital situated in Bogotá, the capital of Colombia. The NICU of the CPO consists of 28 beds distributed on two floors for both intensive and intermediate care. The NICU is a semi-open unit; parents can visit their babies between 8am-6pm. Music therapy is part of an interdisciplinary therapy team including respiratory therapy, speech and language therapy, and occupational therapy. Kangaroo Care is a standard intervention for all parents and babies in the NICU of the CPO. For a more detailed description of the research institution and the music therapy service at the NICU of the CPO, see Ettenberger et al. (2017) and Ettenberger et al. (2014).

Group allocation

All participating mothers and babies were allocated to the same intervention group. First, they were identified by the medical staff following the inclusion and exclusion criteria and then referred to music therapy. In a second step, information about the study was provided to the parents during an initial interview and the study's risks, goals and procedures were explained and informed consent was obtained. Then, mothers filled out a form including socio-demographic data, infant-related data, and data regarding musical tastes, the use of music at home and the use of music during pregnancy. Finally, mothers filled out the first set of questionnaires (MIBS, SWEMWBS, HADS).

Fig. 1 shows the flow-diagram of the study:

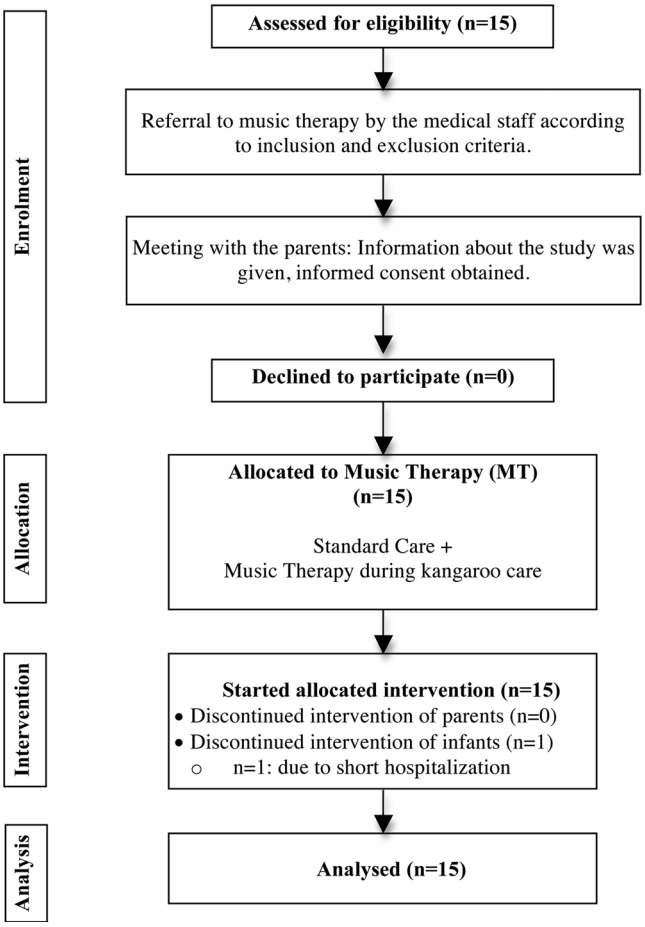

Fig. 1. xxx.
(Flow-diagram adapted from Schulz, Altman, & Moher (2010). Please note that the numbers in this flow diagram refer to the participating parents. Since the intervention group included two pairs of twins, from which one infant was excluded, the number of parents in the intervention group is n = 15, but the number of infants is n = 16.)

Procedure and music therapy interventions

In this study, a minimum of four and a maximum six music therapy sessions were held with each parent and their baby during Kangaroo Care, summing up a total of 83 sessions (mean 5.5 sessions per participant). Each session lasted between 15–20 min (mean 14.5 min). Mothers participated in all music therapy sessions; fathers participated actively in 47 sessions (56.6%) and other family members (i.e. grandparents) in 5 sessions (6.0%).

The aim of the first music therapy session was getting to know the parents musically. This was achieved by exploring their favourite song as assessed during the initial interview: for example by singing the song, humming together the melody, or listening to it actively. During the second, third, fourth and fifth session, the structure of the welcome song was created and discussed with the parents. Parents could choose between composing a new song including the music and lyrics or using 'song parody' (i.e. changing the lyrics to a familiar song, Baker, Kennelly & Tamplin, 2005). Further techniques such as brain-storming ideas about the song, writing a letter to the baby, thinking about what they would like to tell the baby, etc. were discussed in order to facilitate lyrics development. Parents were also invited to include written messages from other family members (e.g. siblings, grandparents, aunts and uncles) to the lyrics. In each session, the developing welcome song was sung together with the parents and accompanied by the music therapist, who played the basic chord progressions of the song on a nylon string guitar. In this study, all but one pair of parents opted to use 'song parody', with 33.4% choosing a familiar pop song, followed by salsa music (13.3%), Christian music (13.3%), nursery rhymes (13.3%), rock music (13.3%), or Vallenato music (13.3%). In one case, parents chose to invent their own melody (6.7%).

While it was opted to stay as close as possible to the original song, the music was modified in terms of volume and intensity and if necessary, in terms of tonality in case a parent did not feel comfortable with the original tonality. Chordal accompaniment was often simplified to basic progressions according to each genre. Entrainment – the conscious synchronization and modification of musical elements in relation to the physiological, emotional or behavioural states of the babies or parents – was an important element in many sessions and included for example the adjustment of the pulse of the music to the respiratory rate of the baby or parents (e.g. Loewy et al., 2013; Loewy, 2015; the RBL: Rhythm, Breath & Lullaby Compendium, Louis Armstrong Center for Music & Medicine). All sessions were videotaped. After the 3rd session, the mothers filled out again the three questionnaires (MIBS, SWEMWBS, HADS).

The fourth or fifth session was held outside the NICU at a quiet spot in the hallway and was used to create the DVD booklet. During this session, parents designed their own booklet with drawings and writings while listening to their welcome song, which was played live by the music therapist or as a recording via speakers. The last session was used

Table 1
Socio-demographic data of participating mothers.

Category	Number (count)	Percentage (%)
Place of residency		
Urban	11	73.33%
Municipal	4	26.67%
Family income		
Between 1–2 minimum salaries[3]	12	80.00%
Between 2–4 minimum salaries	2	13.33%
More than 4 minimum salaries	1	6.67%
Academic background		
Primary school complete	0	0.00%
Primary school incomplete	1	6.67%
Secondary school complete	4	26.67%
Secondary school incomplete	3	20.00%
Technical level complete	4	26.67%
Technical level incomplete	1	6.67%
University degree complete	1	6.67%
University degree incomplete	1	6.67%
¿With whom do you currently live?		
Alone	0	0.00%
Family	4	26.67%
Spouse	11	73.33%
Other(s)	0	0.00%
Civil status		
Single	4	26,67%
Married	2	13,33%
In a relationship	9	60,00%
Emotional support		
From nobody	0	0.00%
From at least one person	2	13.33%
From at least two people	12	80.00%
From three or more people	1	6.67%
Number of children		
1 child	8	53.33%
2 children	3	20.00%
3 or more children	4	26.67%

to sing with the parents the final version of the welcome song for their babies. After finalizing the music therapy process, a video of the welcome song was edited and handed over to the parents, who then filled out again the respective questionnaires (MIBS, SWEMWBS, HADS). Additionally, semi-structured interviews were held individually with each mother, in which they talked about their experiences in music therapy.

Results

Quantitative results

Since this was a pilot study with just 15 participating mother-infant dyads, it was not expected to detect any statistically significant changes for the quantitative outcome measures. Therefore, univariant descriptive statistical analysis was performed for the socio-demographic data and the data regarding the musical history of the parents. For the MIBS, the SWEMWBS and the HADS, a comparative statistical analysis was performed for the pre-intervention, during-intervention and post-intervention measurements, using IBM SPSS Statistics 20.

Socio-demographic data

Table 1 gives an overview of the socio-demographic data of the participating mothers.

[3] The minimum salary in Colombia for 2015 was 644,350 COP, which was approximately 214.5 USD (Exchange rate of 1 USD = 3003 CPO as by 19th of August of 2015; http://dolar.wilkinsonpc.com.co/dolar-historico/dolar-historico-2015.html)

Table 2
Mother-infant data.

	Mean (range)	Standard deviation	Percentiles		
			25%	Median 50%	75%
Age mothers (years)	24.67 (14–36)	6.72	20.00	24.00	31.00
Gestational age babies (weeks)	31.33 (28–34)	2.09	29.00	31.00	33.00
Birth weight (grams)	1,574.06 (760–2230)	399.59	1,335.00	1,595.00	1,800.00
Gestational age at study start (days)	6.44 (1–16)	3.92	3.75	6.00	8.50

Mother-infant data

In this study, two of the participating mothers gave birth to a set of twins, from which one infant was excluded from the data analysis due to short hospitalization (see Fig. 1, flow-diagram). Therefore, the following data refers to the 15 participating mothers, but to 16 preterm babies. The mothers were between 14 and 36 years old (mean 24.67 years) and the gestational age of the babies at birth was between 28 and 34 weeks (mean 31.50 weeks). The babies' birth weight was between 760 and 2230 g (mean 1574.06 g) and at study start the babies were between 1 and 16 days old (mean 6.44 days). Table 2 summarizes the mother-infant data:

Mother-to-Infant Bonding Scale (MIBS)

The comparative analysis of the MIBS showed a decrease in total scores from the first set of measurements (pre-intervention, 1.25 points, *SD 1.39*) to the second (during-intervention, 0.56 points, *SD 0.81*) and third measurement (post-intervention, 0.62 points, *SD 0.80*), indicating a favourable effect on mother-infant bonding (Table 3).

Fig. 2 shows the Boxplot of the MIBS:

The Short Warwick-Edinburgh Mental Well-being Scale (SWEMWBS)

The results of the SWEMWBS showed a slight increase in total points from the pre-intervention to the post-intervention measurements, indicating a greater overall mental wellbeing over the course of the therapy process (pre-intervention, 26.06 points, *SD 3.36*; during intervention, 25.63 points, *SD 4.34*; post-intervention, 27.04 points, *SD 3.96*) (Table 4).

Fig. 3 shows the Boxplot diagram for the SWEMWBS:

The Hospital Anxiety and Depression Scale (HADS)

For the HADS, the sub-scales for anxiety and depression were analysed separately.

HADS – anxiety sub-scale. The total scores for the anxiety sub-scale decreased gradually from 6.60 points (*SD* 2.99) at the pre-intervention measurement to 5.93 (*SD* 3.43) to 5.33 (*SD* 2.94) at the post-intervention measurement, indicating a decrease in anxiety levels in mothers (Table 5).

Fig. 4 shows the Boxplot diagram for the HADS – Anxiety sub-scale:

HADS – depression sub-scale. The total scores rated on the depression sub-scale decreased gradually from the pre-intervention measurement (4.07 points, *SD* 3.43), to the measurement during the therapy process (3.80 points, *SD* 2.75), to the post-intervention measurement (2.87 points, *SD* 2.53), indicating an improvement in depressive symptoms (Table 6).

Fig. 5 shows the Boxplot diagram for the HADS – Depression scale:

Table 3
Total scores Mother-to-Infant Bonding Scale (MIBS).

	Mean (range)	Standard deviation	Percentiles		
			25%	Median 50%	75%
Pre-intervention	1.25 (0–5)	1.39	0.00	1.00	1.75
During intervention	0.56 (0–2)	0.81	0.00	0.00	1.00
Post-intervention	0.62 (0–2)	0.80	0.00	0.00	1.00

Table 4
Total scores Short Warwick-Edinburgh Mental Well-being Scale (SWEMWBS).

	Mean (range)	Standard deviation	Percentiles		
			25%	Median 50%	75%
Pre-intervention	26.06 (18–33)	3.36	24.11	27.03	28.13
During intervention	25.63 (19–35)	4.34	24.11	26.02	28.13
Post-intervention	27.04 (19–35)	3.96	25.03	28.13	29.31

Qualitative analysis

In general, the participating mothers appreciated music therapy song writing very much and stated that composing a welcome song was helpful for themselves and their babies.

Thematic analysis resulted in three main themes: 'Bonding', 'Maternal wellbeing' and 'Empowerment'. Fig. 6 shows the final thematic map.

Bonding

The theme 'bonding' includes the sub-themes 'connectedness', 'expressing emotions/feelings' and 'relationship'. The mothers stated that they felt more connected to their babies during music therapy and that their babies understood what they wanted to express to them through their song. Most mothers defined 'connectedness' as a physical and permanent closeness towards their babies. The emotions or feelings that mothers most often wanted to express to their babies were: love, tenderness, happiness, joy, passion, or pleasure. The sub-theme 'relationship' refers to the babies' behaviours that resulted in more reciprocal or interactive moments between them and their mothers, such as their baby's gaze, opening their eyes or their gestures. Mothers frequently answered to these behaviours by modulating their voices, initiating infant-directed vocalizations or by gently touching their baby.

Maternal wellbeing

The theme 'maternal wellbeing' is composed by three sub-themes: 'relaxation', 'pleasant experience', and 'distraction'. That mothers could relax during music therapy was the most frequently mentioned statement. Mostly, mothers associated 'relaxation' with states of calmness or peace for example. Also, many mothers referred to music therapy as a pleasant experience (fun, nice, satisfying) and that they liked the idea of creating a song for their baby very much. Finally, mothers mentioned that music therapy was helpful for them because it was an activity outside their daily routine in the NICU and something that helped them to forget their concerns and worries for a while.

Empowerment

'Empowerment' is the last theme and consists of the sub-themes 'wellbeing of the baby', 'active care' and 'future'. Most mothers identified that music therapy was beneficial for their baby and helped them in their stimulation or relaxation, for soothing them when they were crying or for helping them in transitioning more easily to sleep. 'Active care' refers to the statements that mothers made with respect to be able to play a more active role in the care of their baby either directly through singing or indirectly through a boost of confidence and trust they gained through interacting musically with their babies. The last sub-theme 'future' consists of the mothers' statements regarding the possibilities to use the welcome song at home, their fantasies about how their babies would react to the welcome song when they get older and the long-term bond they felt to have established through composing a song for their baby.

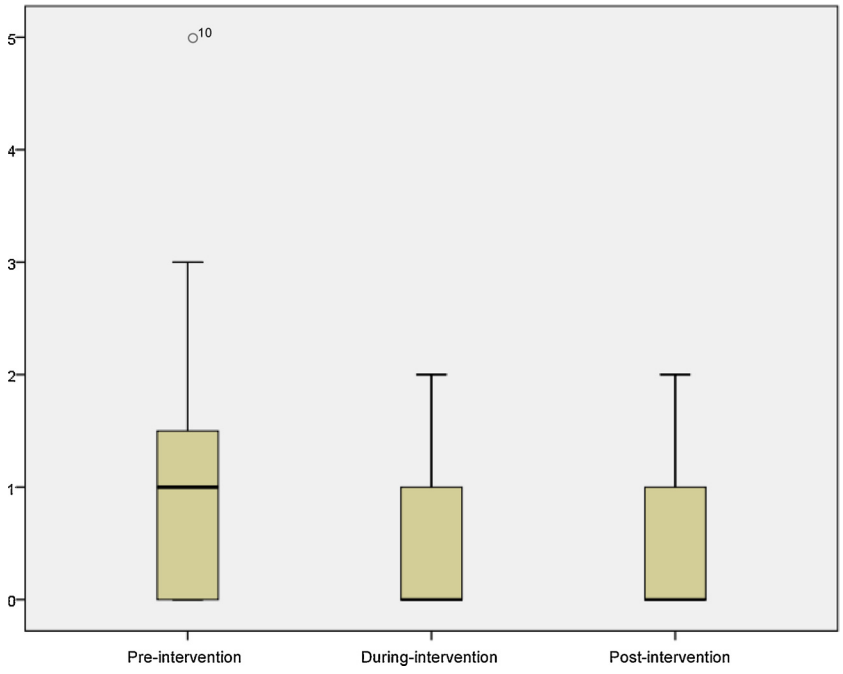

Fig. 2. Boxplot MIBS.

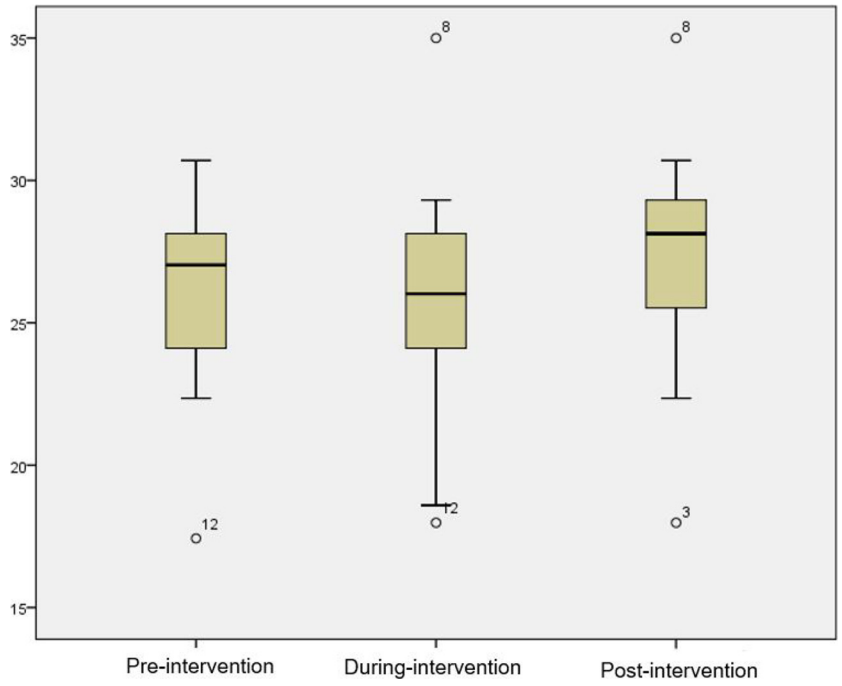

Fig. 3. Boxplot SWEMWBS.

Table 5
Total scores Hospital Anxiety and Depression Scale (HADS) – Anxiety sub-scale.

	Mean (range)	Standard deviation	Percentiles		
			25%	Median 50%	75%
Pre-intervention	6.60 (1–12)	2.99	5.00	6.00	8.00
During intervention	5.93 (0–11)	3.26	4.00	5.00	9.00
Post-intervention	5.33 (2–12)	2.94	4.00	4.00	6.00

Discussion

The hypothesis of this study proposed that music therapy song writing would provide positive effects on maternal bonding, anxiety levels, depressive symptoms and mental wellbeing. While the findings seem to support this hypothesis, due to the small sample size the results need to be interpreted cautiously.

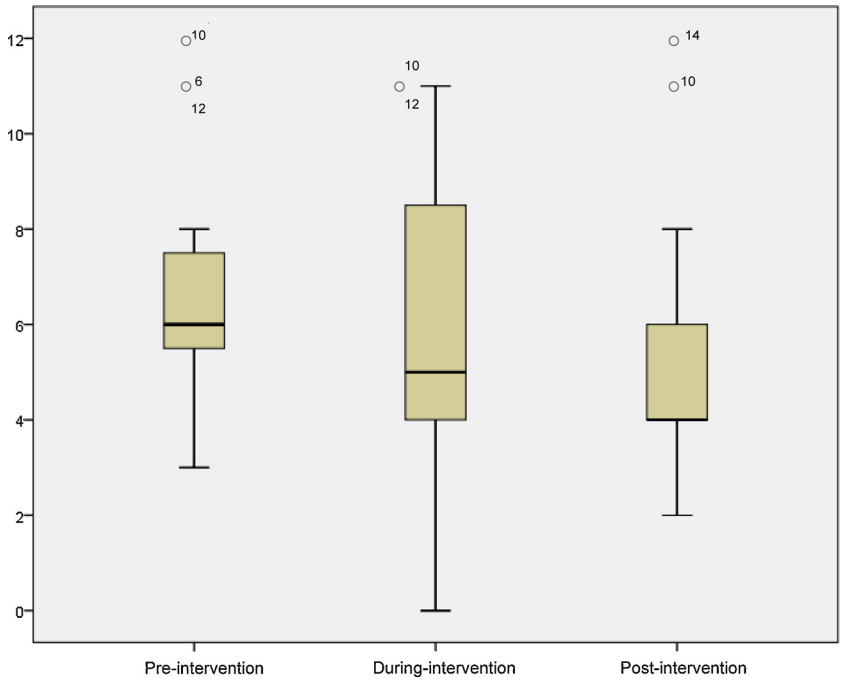

Fig. 4. Boxplot HADS – Anxiety.

Table 6
Total scores Hospital Anxiety and Depression Scale (HADS) – Depression subscale.

	Mean (range)	Standard deviation	Percentiles		
			25%	Median 50%	75%
Pre-intervention	4.07 (0–13)	3.43	1.00	4.00	5.00
During intervention	3.80 (1–10)	2.75	2.00	3.00	5.00
Post-intervention	2.87 (0–9)	2.53	1.00	2.00	5.00

Quantitative outcome measures

Mother-to-infant bonding scale (MIBS)

In general terms, the results of this pilot study indicate a favourable effect of music therapy song writing on mother-infant bonding, with a decrease of about 50% of the MIBS total scores from the pre-intervention (1.25, *SD 1.39*) to the post-intervention measurements (0.62, *SD 0.80*). This is the third study conducted in the same research institution focusing on parent-infant bonding using the MIBS. In contrast to our two former studies (Ettenberger et al., 2017; Ettenberger et al., 2014), in this study the MIBS was not only applied before the first and after the last therapy session, but also in the middle of the therapy process. This was implemented with the aim to follow more closely how bonding might evolve for parents over the course of hospitalization.

Equally to what was discussed as a hypothesis in (Ettenberger et al., 2017), the results of this study confirm that music therapy seems to be especially effective for parents with a risk for impaired bonding (i.e. score > 2 as a cut-off point by Bienfait et al., 2011). In our first study (Ettenberger et al., 2014), 46% of mothers scored > 2 in the pre-intervention period and 90% of those mothers scored ≤2 in the post-intervention measurement. In our second study (Ettenberger et al., 2017), 18% of mothers scored > 2 in the pre-intervention period and all of them improved their scores in the post-intervention measurement, but just 34% of those mothers scored ≤2. In this study, 20% of mothers scored > 2 at the pre-intervention measurement and 100% of those mothers scored ≤2 both at the during-intervention and the post-intervention measurement. This may hint at music therapy song writing as an especially effective method for mothers at risk for an impaired bonding.

Besides our own studies, just one other study was identified that also measured bonding showing inconclusive results (Cevasco, 2008). This makes comparisons difficult and calls for more research with regard to music therapy and bonding in the NICU. However, taking together the results of our own three studies, evidence gets stronger for the benefits of music therapy on bonding. We have now data from 70 participating mothers with an overall mean score of 1.60 (*SD 1.83*) before the first music therapy session compared to an overall mean score of 1.22 (*SD 1.46*) after the last therapy session. While the MIBS can be a useful tool for both research and clinical practice due to its shortness and quick analysis, a few mothers expressed difficulties in understanding specific concepts addressed by the MIBS (i.e. the item 'neutral or feeling nothing' or the term 'protective'). Thus, the scale should to be validated in Colombia taking into account the cultural connotations with regard to these concepts.

The short Warwick-Edinburgh mental well-being scale (SWEMWBS)

To our knowledge, this is the first music therapy study in the NICU that uses the SWEMWBS and the results suggest that mental wellbeing in participating mothers improved slightly over the course of the music therapy process. This is important, since mental wellbeing is not only key for parents when navigating through the emotional ups and downs during hospitalization, but also for their baby. Parental stress, depressive symptoms and elevated anxiety levels can negatively influence parent-infant bonding, their behaviours towards the baby and can alter their perception of parental competence, all of which have an impact on the infant's long-term cognitive, social, and emotional development (Busse, Stromgren, Thorngate, & Thomas, 2013; Hall, Phillips, & Hynan, 2016).

Since no cut-off points are established for both the WEMWBS and the SWEMWBS (Taggart, Stewart-Brown, & Parkinson, 2015), the scale aims not to diagnose abnormal mental wellbeing. However, due to its shortness and quick analysis we found the SWEMWBS to be a useful tool for getting an overall feeling for parental mental wellbeing in the NICU. Interestingly, the participating mothers in this study scored on average above the general population as detected by a national survey from the UK (Fat, Scholes, Boniface, Mindell, & Stewart-Brown, 2017),

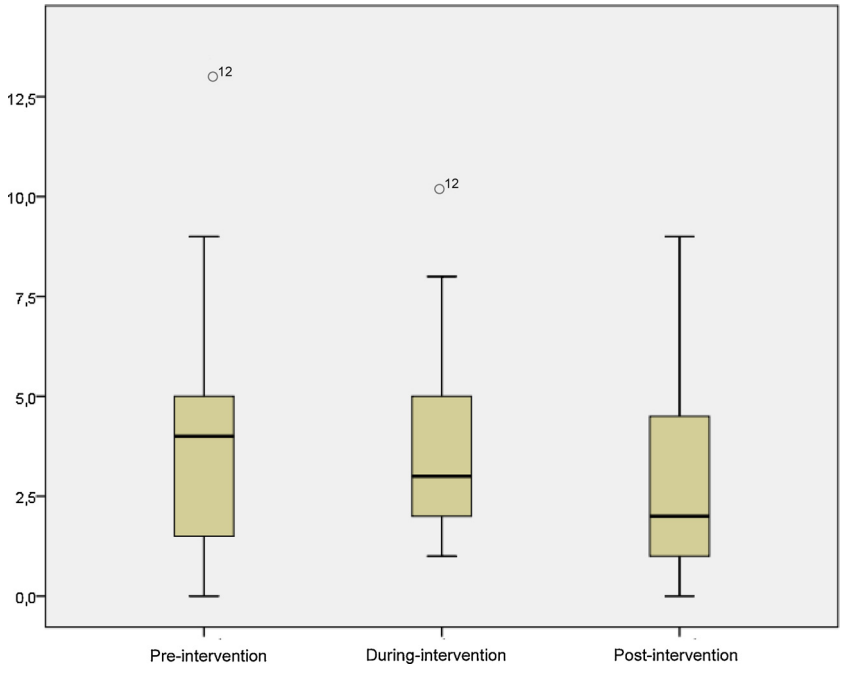

Fig. 5. Boxplot HADS – Depression.

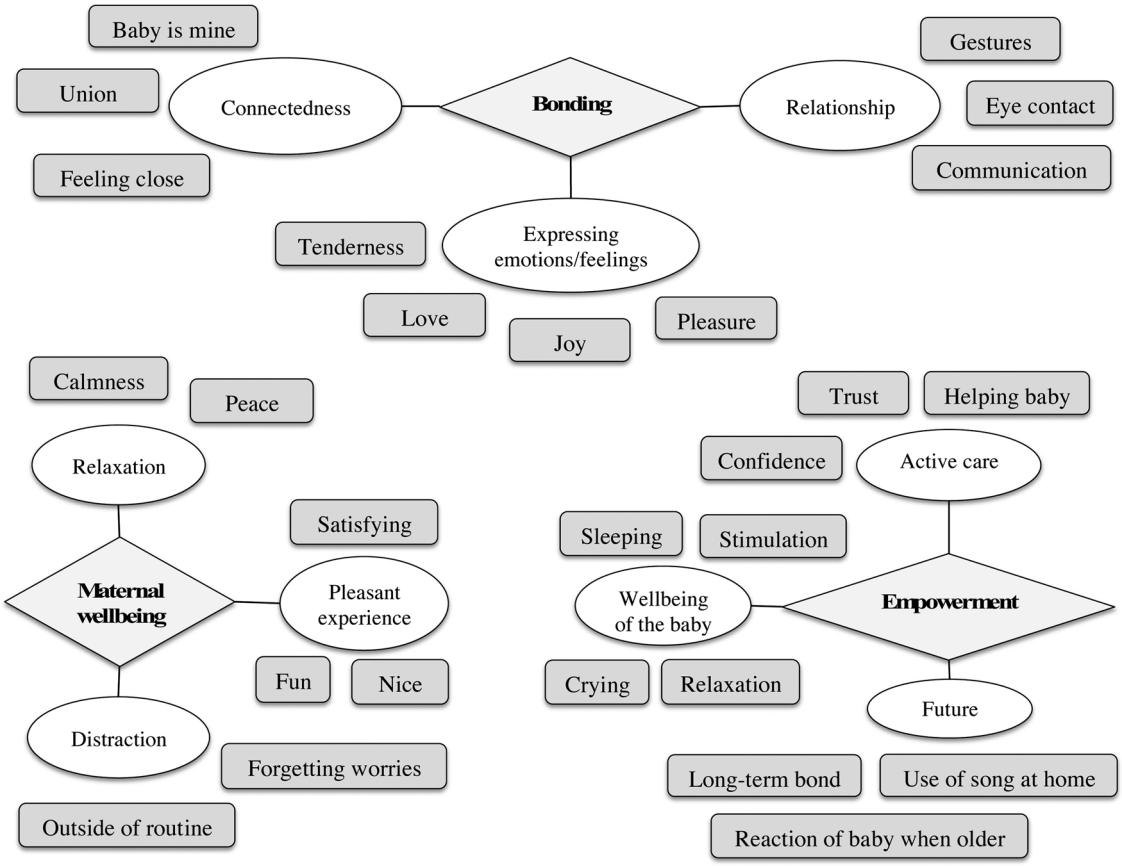

Fig. 6. Thematic map.

indicating that mental wellbeing was already high before the start of music therapy. This should be taken into account when interpreting the results.

Hospital anxiety and depression scale (HADS)

The results of both the anxiety and the depression sub-scale indicate positive effects of music therapy song writing on anxiety levels and depressive symptoms in participating mothers. While no other music therapy study is known to the authors that used the HADS, anxiety levels were measured in a handful of other studies using the State-Trait Anxiety Inventory (STAI) (Arnon et al., 2014; Ettenberger et al., 2014; Ettenberger et al., 2017; Lai et al., 2006; Schlez et al., 2011). However, the methodological aspects of these studies differ heavily among each other and – besides our own studies – were conducted by non-music therapists using recorded music (Lai et al., 2006), live music played by a musician (Schlez et al., 2011) or parental singing (Arnon et al., 2014). Besides these differences, all studies report improvements in maternal anxiety levels, which was also confirmed by a recent meta-analysis, demonstrating a positive large effect size of music interventions in the NICU on maternal anxiety (Bieleninik, Ghetti, & Gold, 2016). Both increased anxiety levels and depressive symptoms are among the most frequently mentioned mental health challenges for parents in the NICU and thus of utmost importance. However, in this study, both anxiety levels and depressive symptoms were moderate to low in participating mothers already before the therapy start. This is similar to other studies measuring anxiety and in mothers and fathers in the NICU depression (Carter, Mulder, Bartram, & Darlow, 2008) and calls for a more distinctive view on mental health for this population.

Qualitative analysis

This is the third study in which we used thematic analysis (Clarke & Braun, 2013; Braun & Clarke, 2006) for identifying patterns and key concepts in the data collected with semi-structured interviews after the music therapy process. Similar sub-themes that we also found in our two former studies (Ettenberger et al., 2017; Ettenberger et al., 2014) are parental relaxation, the distraction from worries, feelings of closeness and connectedness towards their baby and parental sensitivity towards their babies' communicational and behavioural cues during music therapy.

Qualitative studies about music therapy with preterm babies and their parents in the NICU are just recently emerging (Palazzi, Meschini, & Piccinini, 2017; McLean, 2016; Haslbeck, 2013), but the themes or categories described in these studies fit very well to our own results, such as 'empowerment of the infant' and 'empowerment of the mother' (Palazzi et al., 2017), 'intimacy' (McLean, 2016), or 'empowerment', 'communicative musicality' and 'responsiveness' (Haslbeck, 2013). These are very important findings, since these concepts make some of the mechanisms visible why music therapy may be helpful for parents. While a detailed analysis of these studies goes beyond the scope of this article, more qualitative or mixed-method studies are certainly needed in order to get a more complete picture of parents' lived experiences during music therapy in the NICU.

Limitations

This study had several limitations. First, since this was a feasibility study piloting a specific music therapy method (i.e. song writing, Baker & Wigram, 2005), no control group was implemented. As music therapy is a regular clinical service for parents and babies in the NICU of the CPO, establishing a control group that does not receive any music therapy is difficult and ethically questionable. While in our second study (Ettenberger et al., 2017) this problem was solved through a historical control group, in this study the outcome measures were

exclusively collected from the participating mothers. Since the MIBS, the SWEMWBS and the HADS are not routine screening instruments at the CPO, a historical control group was thus not feasible.

Second, due to the small sample size, descriptive statistics and univariant analysis was used for the quantitative data and *p*-values were not calculated. Thus, statistically significant findings were not obtained.

Third, integrating mothers, fathers and grandparents to the music therapy sessions was chosen in order to stay close to clinical practice. However, the data was collected exclusively from the participating mothers, which could have been a confounding factor. Contrary to our former study (Ettenberger et al., 2017), in this study fathers were not included in the data collection. While fathers participated in more than 50% of the sessions, uncertainty regarding the fathers' availability due to being at work or taking care of siblings at home and due the restricted visiting hours for fathers, it was opted not to include them in the data collection and analysis. However, this should be taken into account for future trials.

Fourth, since the music therapy sessions took place during Kangaroo Care and it is known that Kangaroo Care itself enhances parent-infant bonding (Cho et al., 2016), it is not possible to estimate the net effect of music therapy on the outcomes in this study. However, Kangaroo Care is a standard intervention for all parents and babies in the NICU of the CPO and it is thus not viable to form a control group without Kangaroo Care.

Fifth, as mentioned in our former studies (Ettenberger et al., 2017; Ettenberger et al., 2014), the cultural context needs to be taken into account when interpreting the results of this study. Colombians are generally easily willing to engage in active musical experiences, inside and outside health care settings. Also, people in Colombia are quite open in sharing their emotions and thoughts, which might favour methods like music therapy song writing or specific interventions inclusive of parental singing. This might be different in other contexts and cultures and should therefore be taken into account. Cross-cultural studies that aim at investigating the similarities and differences in using music in the NICU are therefore needed.

And sixth, while mixed-methods research is certainly an excellent way to obtain both quantitative outcomes and to understand the meaning and significance of music therapy for parents in the NICU, it is extremely time and resource consuming. Therefore, the delay between the intervention period of this pilot study (August–October 2015) and the publication of the study (end of 2017) is quite long. While this might not be a limitation per se, it is an important point to consider for other music therapists aiming to conduct mixed-methods research in this field.

Conclusion

Music therapy song writing can be a powerful method to holistically treat parents and preterm babies in the NICU by addressing psychosocial, interactive and infant-related domains of care. Music therapy song writing can offer parents a way to creatively express their feelings and thoughts, to participate actively in the care of their baby, to musically interact with their baby and to increase their sensitivity towards their baby's communicational cues. The study presented in this article fits well into the larger field of family-centred music therapy in the NICU (e.g. Ettenberger et al., 2017a; Haslbeck & Hugoson, 2017; Shoemark, 2017), inclusive of acknowledging culture as a crucial factor to bear in mind (Loewy, 2015; Shoemark and the WCMT 2014 NICU Music Therapy Roundtable Group, 2015). Music therapy song writing offers also the possibility to understand and work with parents as a fragile and distinct entity from the baby and may thus help in trauma amelioration. A larger trial with more participants is needed to further investigate the results of this pilot study and more mixed-methods or qualitative studies are needed in order to better understand the experiences of parents during music therapy in the NICU. Future research should also address the impact of music therapy on trauma not only as a potential threat in establishing a successful parent-infant relationship, but also as an essential mechanism that can negatively impact mental health of parents in the NICU.

Conflicts of interest

None.

Acknowledgements

The authors would like to thank Dr. Catherin Rojas, the coordinator of the NICU of the CPO, the directives of the CPO and all the parents and babies who were part of this study. Additionally, The authors would like to thank Raúl Forero, José Gil, Mayra Guarín and Sergio Páez of the Universidad Nacional de Colombia for the help with the statistical analysis.

References

Andrew, S., & Halcomb, E. J. (Eds.). (2009). *Mixed methods research for nursing and the health sciences*. Oxford, UK: Blackwell Publishing.

Arnon, S., Diamant, C., Bauer, S., Regev, R., Sirota, G., & Litmanovitz, I. (2014). Maternal singing during kangaroo care led to autonomic stability in preterm infants and reduced maternal anxiety. *Acta Pædiatrica, 103*, 1039–1044.

Baker, F., & Wigram, T. (Eds.). (2005). *Sonwriting Methods, Techniques and Clinical Applications for Music Therapy Clinicians, Educators and Students*. London and Philadelphia: Jessica Kingsley Publishers.

Baker, F., Kennelly, J., & Tamplin, J. (2005). Songwriting to explore identity change and sense of self-concept following traumatic brain injury. In F. Baker, & T. Wigram (Eds.). *Songwriting methods, techniques and clinical applications for music therapy clinicians, educators and students* (pp. 116–133). London and Philadelphia: Jessica Kingsley Publishers.

Barudy, J., & Dantagnan, M. (2013). *Los buenos tratos a la infacia: Parentalidad, apego y resiliencia.* Barcelona: Colección psicología.

Benzies, K. M., Magill-Evans, J. E., Hayden, K. A., & Ballantyne, M. (2013). Key components of early intervention programs for preterm infants and their parents: A systematic review and meta-analysis. *BMC Pregnancy and Childbirth, 13*(Suppl. 1), 10–15. http://www.biomedcentral.com/1471-2393/13/S1/S10.

Bieleninik, L., Ghetti, C., & Gold, C. (2016). Music therapy for preterm infants and their parents: A meta-analysis. *Pediatrics, 138*(3), http://dx.doi.org/10.1542/peds.2016-0971.

Bienfait, M., Maury, M., Haquet, A., Faillie, J.-L., Franc, N., Combes, C., et al. (2011). Pertinence of the self-report mother-to-infant bonding scale in the neonatal unit of a maternity ward. *Early Human Development, 87*, 281–287. http://dx.doi.org/10.1016/j.earlhumdev.2011.01.031.

Brandon, A. R., Pitts, S., Denton, W. H., Allen, C., Stringer, M., & Evans, H. (2009). A history of the theory of prenatal attachment. *Journal of Prenatal and Perinatal Psychology and Health, 23*(4), 201–222.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. http://dx.doi.org/10.1191/1478088706qp063oa.

Busse, M., Stromgren, K., Thorngate, L., & Thomas, K. A. (2013). Parent responses to stress: PROMIS in the NICU. *Care Nurse, 33*(4), 52–60. http://dx.doi.org/10.4037/ccn2013715.

Carter, J. D., Mulder, R. T., Bartram, A. F., & Darlow, B. A. (2008). Infants in a neonatal intensive care unit: Parental response. *Archive of Disease in Childhood. Fetal and Neonatal Edition, 90*, 109–113. http://dx.doi.org/10.1136/adc.2003.031641.

Castellví, P., Forero, C. G., Codony, M., Vilagut, G., Brugulat, P., Medina, A., et al. (2014). The Spanish version of the Warwick-Edinburgh mental well-being scale (WEMWBS) is valid for use in the general population. *Quality of Life Research, 23*(3), 857–868. http://dx.doi.org/10.1007/s11136-013-0513-7.

Cataudella, S., Lampis, J., Busonera, A., Marino, L., & Zavattini, G. C. (2016). From parental-fetal attachment toa parent-infant relationship: A systematic review about prenatal protective and risk factors. *Life Span and Disability, 19*(2), 185–219.

Cevasco, A. M. (2008). The effects of mothers' singing on full-term and preterm infants and maternal emotional responses. *Journal of Music Therapy, 45*(3), 273–306.

Cho, E.-S., Kim, S.-J., Kwon, M. S., Cho, H., Kim, E. H., & Jun Lee, E. M. S. (2016). The effects of kangaroo care in the neonatal intensive care unit on the physiological functions of preterm infants, maternal–infant attachment, and maternal stress. *Journal of Pediatric Nursing, 31*(4), 430–438. http://dx.doi.org/10.1016/j.pedn.2016.02.007.

Clarke, V., & Braun, V. (2013). Teaching thematic analysis. *The Psychologist, 26*(2), 120–123.

Davis, L., Edwards, H., Mohay, H., & Wollin, J. (2003). The impact of very premature birth on the psychological health of mothers. *Early Human Development, 73*, 61–70. http://dx.doi.org/10.1016/S0378-3782(03)00073-2.

De Wolff, M. S., & van IJzendoorn, M. H. (1997). Sensitivity and attachment: A meta-analysis on parental antecedents of infant attachment. *Child Development, 68*(4), 571–591.

DeCasper, A. J., & Fifer, W. P. (1980). Of human bonding: Newborns prefer their mothers' voices. *Science, 208*(4448), 1174–1176.

Edwards, J. (Ed.). (2011). *Music therapy and parent-Infant bonding*. New York: Oxford: University Press.

Ettenberger, M., Odell-Miller, H., Rojas Cárdenas, C., Torres Serrano, S., Parker, M., & Camargo Llanos, S. M. (2014). Music therapy with premature infants and their caregivers in Colombia – a mixed methods pilot study including a randomized trial. *Voices: A World Forum for Music Therapy, 14*(2), http://dx.doi.org/10.15845/voices.v14i2.756 [np.].

Ettenberger, M., Rojas Cárdenas, C., Odell-Miller, H., & Parker, M. (2017). Family-centred music therapy with preterm infants and their parents in the Neonatal Intensive Care Unit (NICU) in Colombia – a mixed-methods study. *Nordic Journal of Music Therapy, 26*(3), 207–234. http://dx.doi.org/10.1080/08098131.2016.1205650.

Ettenberger, M. (2017a). Music therapy in the Neonatal Intensive Care Unit (NICU): Putting the families at the centre of care. *British Journal of Music Therapy, 31*(1), 12–17. http://dx.doi.org/10.1177/1359457516685881 [1–6].

Ettenberger, M. (2017b). Music therapy during end-of-life care in the Neonatal Intensive Care Unit (NICU) – reflections from early clinical practice in Colombia. *Voices: A World Forum for Music Therapy, 17*(2), http://dx.doi.org/10.15845/voices.v17i2.921 [np].

Evans, T., Whittingham, K., & Boyd, R. (2012). What helps the mother of a preterm infant become securely attached, responsive and well-adjusted? *Infant Behavior & Development, 35*, 1–11. http://dx.doi.org/10.1016/j.infbeh.2011.10.002.

Fat, L., Scholes, S., Boniface, S., Mindell, J., & Stewart-Brown, S. (2017). Evaluating and establishing national norms for mental wellbeing using the short Warwick–Edinburgh Mental Well-Being Scale (SWEMWBS): Findings from the health survey for England. *Quality of Life Research, 26*(5), 1129–1144. http://dx.doi.org/10.1007/s11136-016-1454-8.

Flaks, M. K., Priscila, S. M., Almeida, P. A., Bueno, O. F. A., Pupo, M. C., Andreoli, S. B., et al. (2014). Attentional and executive functions are differentially affected by post-traumatic stress disorder and trauma. *Journal of Psychiatric Research, 48*(1), 32–39. http://dx.doi.org/10.1016/j.jpsychires.2013.10.009.

Gerhardt, K., & Abrams, R. (2000). Fetal exposures to sound and vibroacoustic stimulation. *Journal of Perinatology, 20*, 20–29.

Gondwe, K. W., & Holditch-Davis, D. (2015). Posttraumatic stress symptoms in mothers of preterm infants. *International Journal of Africa Nursing Sciences, 3*, 8–17. http://dx.doi.org/10.1016/j.ijans.2015.05.002.

Gooding, J., Cooper, L., Blaine, A., Franck, L., Howse, J., & Berns, S. (2011). Family support and family-centered care in the neonatal intensive care unit: Origins, advances, impact. *Seminars in Perinatology, 35*(1), 20–28.

Groh, A. M., Pasco Fearon, R. M., van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Roisman, G. I. (2017). Attachment in the early life course: Meta-analytic evidence for its role in socioemotional development. *Child Development Perspectives, 11*(1), 70–76. http://dx.doi.org/10.1111/cdep.12213.

Guerra Guerra, J., & Ruiz de Cárdenas, C. (2008). Interpretación del cuidado de enfermería neonatal desde las experiencias y viviencias de los padres. *Avances en Enfermería, 26*(2), 80–90.

Hall, S. L., Phillips, R., & Hynan, M. T. (2016). Transforming NICU care to provide comprehensive family support. *Newborn and Infant Nursing Reviews, 16*(2), 69–73. http://dx.doi.org/10.1053/j.nainr.2016.03.008.

Haslbeck, F., & Hugoson, P. (2017). Sounding together: Family-centered music therapy as facilitator for parental singing during skin-to-skin contact. In M. Filippa, P. Kuhn, & B. Westrup (Eds.). *Early vocal contact and preterm infant brain development* (pp. 217–238). Springer: Cham.

Haslbeck, F. (2013). The interactive potential of creative music therapy with premature infants and their parents: A qualitative analysis. *Nordic Journal of Music Therapy, 23*(1), 36–70. http://dx.doi.org/10.1080/08098131.2013.790918.

Herrero, M., Blanch, J., Peri, J. M., De Pablo, J., Pintor, L., & Bulbena, A. (2003). A validation study of the hospital anxiety and depression scale (HADS) in a Spanish population. *General Hospital Psychiatry, 25*(4), 277–283.

Ionio, C., Colombo, C., Brazzoduro, V., Mascheroni, E., Confalonieri, E., Castoldi, F., et al. (2016). Mothers and fathers in NICU: The impact of preterm birth on parental distress. *Europe's Journal of Psychology, 12*(4), 604–621. http://dx.doi.org/10.5964/ejop.v12i4.1093.

Johnson, S., Whitelaw, A., Glazebrook, C., Israel, C., Turner, R., White, I. R., et al. (2009). Randomized trial of a parenting intervention for very preterm infants: Outcome at 2 years. *The Journal of Pediatrics, 155*(4), 488–495. http://dx.doi.org/10.1016/j.jpeds.2009.04.013.

Jotzo, M., & Poets, C. F. (2005). Helping parents cope with the trauma of premature birth: An evaluation of a trauma-preventive psychological intervention. *Pediatrics, 115*(4), 915–919. http://dx.doi.org/10.1542/peds.2004-0370.

Kroll, T., & Neri, M. (2009). Designs for mixed methods research. In S. Andrew, & E. J. Halcomb (Eds.). *Mixed methods research for nursing and the health sciences* (pp. 31–49). Oxford, UK: Blackwell Publishing.

Kuo, D. Z., Houtrow, A. J., Arango, P., Kuhlthau, K. A., Simmons, J. M., & Neff, J. M. (2012). Family-centered care: Current applications and future directions in pediatric health care. *Maternal & Child Health Journal, 16*, 297–305. http://dx.doi.org/10.1007/s10995-011-0751-7.

López, M. A., Gabilondo, A., Codonoy, M., García-Forero, C., Vilagut, G., Castellví, P., et al. (2013). Adaptation into Spanish of the Warwick-Edinburgh Mental Well-being Scale (WEMWBS) and preliminary validation in a student sample. *Quality of Life Research, 22*(5), 1099–1104. http://dx.doi.org/10.1007/s11136-012-0238-z.

Lai, H.-L., Chen, C.-J., Peng, T.-C., Chang, F.-M., Hsieh, M.-L., Huang, H. Y., et al. (2006). Randomized controlled trial of music during kangaroo care on maternal state anxiety and preterm infants' responses. *International Journal of Nursing Studies, 43*, 139–146. http://dx.doi.org/10.1016/j.ijnurstu.2005.04.008.

Lartigue, T. (1994). *Guía para la observación del Vínculo Materno – Infantil durante el primer año de vida*. México: Universidad Iberoamericana.

Lindberg, B., Axelsson, K., & Öhrling, K. (2007). The birth of premature infants: Experiences from the fathers' perspective. *Journal of Neonatal Nursing, 13*, 142–149. http://dx.doi.org/10.1016/j.jnn.2007.05.004.

Loewy, J. V., Stewart, K., Dassler, A.-M., Telsey, A., & Homel, P. (2013). The effects of music therapy on vital signs feeding, and sleep in premature infants. *Pediatrics, 131*(5), 902–918. http://dx.doi.org/10.1542/peds.2012-1367.

Loewy, J. V. (2015). NICU music therapy: Song of kin as critical lullaby in research and practice. *Annals of the New York Academy of Sciences, 1337*, 178–185. http://dx.doi.org/10.1111/nyas.12648.

Malm, M.-C., Hildingsson, I., Rubertsson, C., Radestad, I., & Lindgren, H. (2016). Prenatal attachment and its association with foetal movement during pregnancy – a population based survey. *Women and Birth, 29*, 482–486. http://dx.doi.org/10.1016/j.wombi.2016.04.005.

Martin, R., Fanaroff, A., & Walsh, M. (2015). *Neonatal-perinatal medicine diseases of the fetus and infant* (10th ed.). Philadelphia: Elsevier Saunders.

Marx, V., & Nagy, E. (2015). Fetal behavioural responses to maternal voice and touch. *PLoS One, 10*(6), e0129118. http://dx.doi.org/10.1371/journal.pone.0129118.

McLean, E. (2016). Fostering intimacy through musical beginnings: Exploring the application of communicative musicality through the musical experience of parents in a neonatal intensive care unit. *Voices: A World Forum for Music Therapy, 16*(2) [n.p. https://voices.no/index.php/voices/article/view/874/721].

Mikulincer, M., & Shaver, P. (2012). An attachment perspective on psychopathology. *World Psychiatry, 11*, 11–15.

Ministerio de Salud (1993). *Resolución N° 008430 de 1993.* [Santafé de Bogotá D.C.].

Music, G. (2011). *Nurturing natures: Attachment and children's emotional, sociocultural and brain development.* Hove,East Sussex, UK: Psychology Press.

Palazzi, A., Meschini, R., & Piccinini, C. A. (2017). Music therapy intervention for the mother-preterm infant dyad: Evidence from a case study in a Brazilian NICU. *A World Forum for Music Therapy, 17*(2) [n.p. https://voices.no/index.php/voices/article/view/916].

Rutter, N. (1995). The extremely preterm infant. *BJOG: An International Journal of Obstetrics & Gynaecology, 102*(9), 682–687.

Schlez, A., Litmanovitz, I., Bauer, S., Dolfin, T., Regev, R., & Arnon, S. (2011). Combining kangaroo care and live harp music therapy in the neonatal intensive care unit setting. *The Israel Medical Association Journal, 13*, 354–358.

Schulz, K. F., Altman, D. G., & Moher, D. (2010). CONSORT 2010 Statement: Updated guidelines for reporting parallel group randomised trials. *BMJ, 340*, 698–702.

Shah, P. E., Clements, M., & Poehlmann, J. (2011). Maternal resolution of grief after preterm birth: Implications for infant attachment security. *Pediatrics, 127*, 284–292. http://dx.doi.org/10.1542/peds.2010-1080.

Shoemark, H., & the WCMT 2014 NICU Music Therapy Roundtable Group (2015). Culturally transformed music therapy in the perinatal and paediatric neonatal intensive care unit: an international report. *Music & Medicine, 7*(2), 34–36.

Shoemark, H. (2017). Empowering parents in singing to hospitalized infants: The role of the music therapist. In M. Filippa, P. Kuhn, & B. Westrup (Eds.). *Early vocal contact and preterm infant brain development* (pp. 205–215). Springer: Cham.

Simmons, L. V. E., Rubens, C. E., Darmstadt, G. L., & Gravett, M. G. (2010). Preventing preterm birth and neonatal mortality: Exploring the epidemiology causes, and interventions. *Seminars on Perinatology, 34*, 408–415. http://dx.doi.org/10.1053/j.semperi.2010.09.005.

Spittle, A. J., Orton, J., Doyle, L. W., & Boyd, R. (2008). Early developmental intervention programs post hospital discharge to prevent motor and cognitive impairments in preterm infants. *Evidence-Based Child Health, 3*, 145–206. http://dx.doi.org/10.1002/ebch.209.

Stewart, K. (2009a). PATTERNS – a model for evaluating trauma in NICU music therapy: Part 1 – theory and design. *Music and Medicine, 1*(1), 29–40. http://dx.doi.org/10.1177/1943862109338370.

Stewart, K. (2009b). PATTERNS – a model for evaluating trauma in NICU music therapy: Part 2 – treatment parameters. *Music and Medicine, 1*(2), 123–128. http://dx.doi.org/10.1177/1943862109344485.

Stewart-Brown, S., Tennant, A., Tennant, R., Platt, S., Parkinson, J., & Weich, S. (2009). Internal construct validity of the Warwick – Edinburgh Mental Well-Being Scale (WEMWBS): A raschanalysis using data from the scottisch health education population survey. *BioMed Central, 7*(15), http://dx.doi.org/10.1186/1477-7525-7-15.

Taggart, F., Stewart-Brown, S., & Parkinson, J. (2015). *Warwick-Edinburgh mental well-being scale (WEMWBS). User guide – version 2.* Edinburgh: Warwick Medical School.

Tamez, R., & Silva, J. (2008). *Enfermería en la Unidad de Cuidados Intensivos Neonatal. Asistencia del recién nacido de alto riesgo.* Buenos Aires: Editorial Médica Panaméricana.

Taylor, A., Atkins, R., Kumar, R., Adams, D., & Glover, V. (2005). A new mother-to-infant bonding scale: Links with early maternal mood. *Archives of Women's Mental Health, 8*, 45–51. http://dx.doi.org/10.1007/s00737-005-0074-z.

Teckenberg-Jansson, P., Huotilainen, M., Pölkki, T., Lipsanen, J., & Järvenpää, A.-L. (2011). Rapid effects of neonatal music therapy combined with kangaroo care on prematurely-born infants. *Nordic Journal of Music Therapy, 20*(1), 22–42. http://dx.doi.org/10.1080/08098131003768123.

Tennant, R., Hiller, L., Fishwick, R., Platt, S., Joseph, S., Weich, S., et al. (2007). The Warwick-Edinburgh Mental Well-being Scale (WEMWBS): Development and UK validation. *Health Quality Life Outcomes, 5*, 63–73. http://dx.doi.org/10.1186/1477-7525-5-63.

Vianna, M., Barbosa, A. P., Carvalhaes, A. S., & Cunha, A. (2011). Music therapy may increase breastfeeding rates among mothers of premature newborns: A randomized controlled trial. *Jornal De Pediatria, 87*(3), 206–212. http://dx.doi.org/10.2223/JPED.2086.

Vreeswijk, C. M. J. M., Maas, A. J. B. M., Rijk, C. H. A. M., & van Bakel, H. J. A. (2014). Fathers' experiences during pregnancy: Paternal prenatal attachment and

representations of the fetus. *Psychology of Men & Masculinity, 15*(2), 129–137.
Yu, C. Y., Hung, C. H., Chan, T. F., Yeh, C. H., & Lai, C. Y. (2012). Prenatal predictors for father-infant attachment after childbirth. *Journal of Clinical Nursing, 21*(11–12), 1577–1583. http://dx.doi.org/10.1111/j.1365-2702.2011.04003.x.
Zelkowitz, P., Na, S., Wang, T., Bardin, C., & Papageorgiou, A. (2011). Early maternal anxiety predicts cognitive and behavioural outcomes of VLBW children at 24 months corrected age. *Foundation Acta Pædiatrica, 100*, 700–704. http://dx.doi.org/10.1111/j.1651-2227.2010.02128.x.