

1 *Article*

2 **Music therapy self-care group for parents of preterm**  
3 **infants in the Neonatal Intensive Care Unit (NICU): A**  
4 **clinical pilot intervention**

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10

11 **Abstract**

12 **Background:** Parents of preterm infants face major mental health challenges in the  
13 Neonatal Intensive Care Unit (NICU). Family-centered music therapy actively  
14 integrates and empowers parents in their infant's care. With the aim to better  
15 understand and address parental needs separately from their babies', a music  
16 therapy (MT) self-care group was implemented as part of clinical practice at the  
17 hospital Clínica de la Mujer in Bogotá, Colombia.

18 **Methods:** The group is provided for both parents twice a week in the NICU. Music  
19 guided relaxations, breathing techniques, and self-expression are at the center of  
20 the MT group sessions. Parents complete a pre/post self-administered Numeric  
21 Rating Scale (NRS) including anxiety levels, stress levels, mood and motivation.

22 **Results:** Parents highly value the MT self-care group at the NICU. On average  
23 there is a 37% improvement in anxiety levels, 28% in stress levels, and 12% in  
24 mood, restfulness and motivation. Being able to relax, to distract themselves from  
25 their worries and having time for themselves are amongst the most frequently  
26 mentioned benefits.

27 **Conclusions:** Addressing parents' needs separately from their babies' treatment  
28 with culturally sensitive interventions aimed to improve parental mental health, is  
29 essential for continuing the development of family-centered music therapy  
30 interventions in the NICU.

31 **Keywords:** music therapy; preterm infants; family-centered care; parents; self-care; wellbeing;  
32 Neonatal Intensive Care Unit (NICU);

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## 34 1. Introduction

35 Having a newborn child is seen as a transformational and often times positive  
36 experience. Having a preterm baby in the Neonatal Intensive Care Unit (NICU)  
37 however, can interrupt the transition into parenthood and cause parents to feel a  
38 surfeit of emotions, often leading to a sense of hopelessness, psychological distress,  
39 anxiety and symptoms of depression [1-5]. Uncertainties revolving around the  
40 infants' health, being in an intimidating and alien environment, the financial  
41 demands of the hospitalization, and the physical appearance of the infant can all be  
42 potential stressors for the parents, putting their emotional and mental wellbeing at  
43 risk [5-7].

44 Mothers of preterm infants may show long lasting signs of posttraumatic stress,  
45 depressive symptoms, and anxiety [8-10]. If the trauma experienced during the  
46 perinatal period is not addressed adequately, it may negatively affect the  
47 relationship between the mother and the child, specifically on the mother's  
48 availability to recognize infant cues and needs [11,12]. Recently, fathers have been  
49 taking a more active role in the NICU [13,14], and just like mothers, fathers are  
50 susceptible to various common stressors [15]. However, having to care for both  
51 their infant and their partner, the pressures of keeping up with employment  
52 obligations, and possible tensions related to cultural and societal expectations  
53 regarding 'masculinity' or gender roles are some of the primary stressors specific to  
54 fathers [13,16-18]. Unfortunately, follow-up on parental psychological wellbeing  
55 during and after hospitalization is not always included in neonatal care settings.  
56 There is a need for culturally appropriate interventions that take into account  
57 psychological distress and wellbeing among parents in the NICU [15,17,19,20].  
58 Understanding and addressing parents' needs as both connected to and distinct  
59 from their baby's needs may help parents not only as individuals, but it may also  
60 positively impact their journey towards parenthood and the relationship they foster  
61 with their baby.

## 62 Family-centered Care and Family-centered Music Therapy in the NICU

63 Family Centered Care (FCC) is a growing approach to pediatric healthcare in  
64 which the family is recognized as the patients' primary source of support and as a  
65 fundamental part of their wellbeing [21]. The principles of FCC include information  
66 sharing, respect and honoring differences, partnership and collaboration,  
67 negotiation, and care in context of family and community [22]. This approach in  
68 health care has become a fundamental pillar in contemporary neonatal care [23] and

69 has shown to strengthen the parent-infant relationship [9,24], increase the wellbeing  
70 of preterm infants [25], and reduce parental stress [26].

71 Music therapy in the NICU is a well-established field of clinical practice and  
72 research [27-29]. Current literature suggests that music therapy is beneficial for both  
73 the neonates and caregivers [30-33]. Interventions directed on the neonate aim to  
74 promote physiological and behavioral self-regulation [31,34], feeding success  
75 [31,35,36] and improve sleep or quiet alert states [31,37]. Positive impacts of music  
76 therapy on parents include relaxation [34], the reduction of anxiety and stress levels  
77 [30,31,38], and improved parent-infant bonding [30,33,40,41]. Qualitative analyses  
78 show that through the use of music parents can feel empowered by having a more  
79 active role in their infants' care [41-43], which is crucial for the transition into  
80 parenthood [44].

81 The recent shift in pediatric health care to actively integrate parents in their  
82 infants' treatment should also consider their individual wellbeing. Family-centered  
83 music therapy in the NICU is rooted in FCC principles and stresses the importance  
84 of both infant and parental wellbeing as being essential in neonatal care settings  
85 [30,43,45,46]. In order to further develop clinical practice and to detect new ways to  
86 help parents cope with potential stressors and mental health risks, a music therapy  
87 self-care group for parents was implemented at the NICU the Clínica de la Mujer.

## 88 **2. Materials and Methods**

### 89 **Context and Setting**

90 The Clínica de la Mujer is one of Bogotá's most renowned maternity hospitals.  
91 Its Level-III NICU has space for 19 incubators located in individual rooms, with a  
92 few rooms reserved for twins. Parents have 24-hour access to the unit and  
93 grandparents can visit the babies once a week. Kangaroo care is a standard  
94 intervention in the NICU and music therapy is part of an interdisciplinary therapy  
95 team including respiratory therapy, speech and language therapy, nutrition, social  
96 work and psychology/psychiatry. FCC principles and a strong commitment to  
97 humanized care build the foundations of the hospital's care philosophy. Music  
98 therapy is provided twice a week for preterm and critically ill full term babies and  
99 their families, focused primarily on parent-infant bonding, infant self-regulation  
100 and parental mental health.

101 The music therapy self-care group for mothers and fathers has been  
102 implemented in July 2018 with the aim to improve parental wellbeing during the  
103 NICU stay. Initially, the idea for the group developed in response to many mothers'  
104 comments regarding their difficulties during breast milk extraction; worries about

105 their babies' health and the pressure to produce enough milk are common stressors  
106 among mothers in the NICU. It was hypothesized that a music therapy self-care  
107 group could help mothers to relax and thus reduce the stress perceived during  
108 breast milk extraction. After a few pilot sessions and in discussion with the parents  
109 and the health care team it became however clear that not only mothers, but also  
110 fathers could benefit from the self-care group. As a result, the group is open for  
111 mothers and fathers since August 2018. The group is provided twice a week, for  
112 15-20 min. on Wednesday afternoon and for 30 min. on Friday morning.

### 113 **Music Therapy Self-Care Group: Procedure and Interventions**

114 The group takes place in the NICU's breast milk extraction room before  
115 mothers are scheduled for their next time slot. Although participation in the music  
116 therapy self-care group is voluntary, the nursing and medical team highly  
117 encourage both mothers and fathers to attend. The group usually starts with a short  
118 verbal introduction with the purpose to explain the objectives and procedures for  
119 the new participants and to quickly assess current parents' moods or any specific  
120 stressors.

121 Live music therapy is at the center of the interventions. The music therapist  
122 regularly uses a nylon-string guitar, voice, shakers, an ocean drum, and a  
123 'Samafón'<sup>1</sup> as the principal instruments. Short musical games with shakers, voices  
124 or movements serve as 'ice-breakers', seeking to activate the participants at the  
125 beginning of the session. Then, the music therapist provides verbal relaxation  
126 prompts focused on deep breathing, imagery (i.e. internally going to a place where  
127 participants feel safe and comfortable, or evoking a particular landscape such as  
128 standing on mountain top and looking over the horizon or sitting on the beach and  
129 contemplating the movement of the waves), and/or subtle movements with the  
130 objective to foster body awareness and to make conscious current moods, thoughts,  
131 or emotions. Subsequently, live music is provided, inviting parents to breath with  
132 the music. Alternatively, parents are encouraged to use their voices with the music  
133 by either humming or singing vowels or closed consonants in order to achieve  
134 increased lengths of exhalation and to creatively explore their musicality.

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<sup>1</sup> The 'Samafón' is an instrument shaped similar to a lyre, but instead of the strings, five hollow metal tubes hang from the top to the base of the instrument, connected to each other with threads. Depending on the length of the tubes, notes are lower or higher and the instrument is normally tuned in variations of pentatonic scales. The tubes are played either individually or quickly one after each other with a mallet used for singing bowls and the sound is long lasting. Additionally, the instrument can be rotated easily holding it with one hand, creating ripples of sounds that project themselves in all directions.

135 Although there is debate on what music is best used for relaxation [46], the  
 136 music during the interventions is typically improvised and based on elements such  
 137 as slow tempo, repetition, and subtle melodic and harmonic variations or  
 138 modulations. Often, chord intervals clearly indicating major or minor tonalities (i.e.  
 139 major or minor thirds) are substituted with sus<sup>9</sup> or sus<sup>5</sup> chords, leaving it open to  
 140 the music therapist's clinical improvisation skills to modulate between major or  
 141 minor tonalities.

142 Once the intervention concludes, parents verbally reflect upon their  
 143 experiences, thoughts, and feelings during the group session. The music therapist  
 144 discusses music-assisted self-care techniques that participants can use on their own  
 145 time. Such tools include deep breathing techniques with music or voice, the use of  
 146 recorded music for relaxation, and information sharing between parents.

## 147 Evaluation and Measurements

148 To evaluate the clinical pilot program and better understand the potential  
 149 benefits of the music therapy self-care group for parents in the NICU, the music  
 150 therapy team designed a self-administered pre/post Numeric Rating Scale (NRS). It  
 151 is important to highlight that the results gathered from the NRS are strictly used to  
 152 evaluate the clinical pilot program. The scale aims to detect changes in perceived  
 153 levels of anxiety, stress, and wellbeing before and after the music therapy  
 154 intervention. An "Additional comments" section on the post-intervention sheet  
 155 provides the opportunity for parents to share more personalized experiences and  
 156 recommendations in regards to the group. Figure 1 shows the NRS currently used:

157 **Figure 1.**

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(a)

(b)

167 **Figure 1.** This figure shows the NRS the music therapy team designed to evaluate the clinical pilot program. (a)  
 168 This is the pre-intervention sheet. Participants are given a few minutes prior to the intervention in order to fill it  
 169 out. As it is shown, the music therapy team considered anxiety, stress, and three areas of wellbeing, including  
 170 mood, restfulness, and motivation. (b) This is the post intervention sheet. The only difference is the 'additional

171 comments' section at the bottom of the page. Participants are given a few minutes after the intervention in order  
172 to fill it out.

173 Parents are assured that their names and personal information is not used  
174 during the evaluation of the program. In addition to the NRS, a few semi-structured  
175 interviews were conducted with the participating parents to further understand  
176 their experiences in music therapy.

### 177 3. Results

178 As stated above, the music therapy self-care group takes place twice a week.  
179 However, due to time restriction on one of the days, data collection only takes place  
180 before and after the thirty-minute session on Fridays. While the evaluation of the  
181 group is part of clinical practice, it is hoped that the current data collection will help  
182 in the establishment of a research protocol in the near future.

183

184 **Table 1.** Shows the basic features of the music therapy self-care group since its  
185 implementation from July 2018 to November 2018.

186

Total number of sessions	Total number of participants	Total number of mothers	Total number of fathers
30	122	106	16

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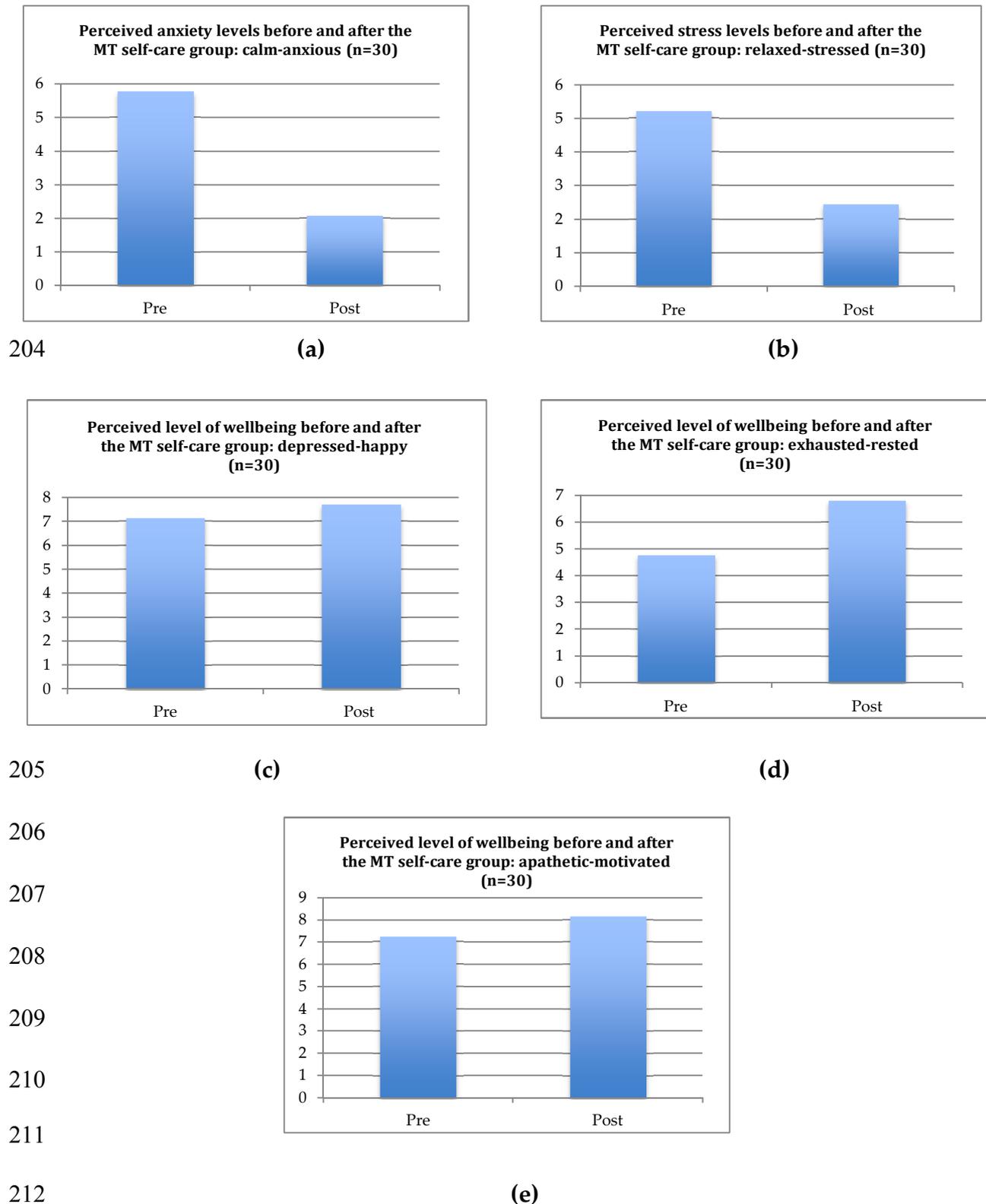
188 The results obtained with the NRS indicate a positive effect of the music  
189 therapy self-care group on parents' perceived anxiety and stress levels, and on their  
190 mood, restfulness, and motivation (Figure 2). On average there is a 37%  
191 improvement in anxiety levels, a 28% improvement in stress levels, 6%  
192 improvement in mood, a 20% improvement in restfulness, and a 9% improvement  
193 in motivation. Being able to relax, to distract themselves from their worries and to  
194 have time for themselves are amongst the most frequently mentioned benefits  
195 parents left in the 'additional comments' section

196 Bearing in mind the cultural norms, perceptions on gender roles, and  
197 employment obligations, there are not as many fathers present as mothers  
198 throughout the pilot program. Nonetheless, participating fathers regularly express  
199 having a positive experience with the group and encouraged that it be formalized in  
200 NICU care.

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202

203 **Figure 2.**



213 **Figure 2.** This figure shows the bar charts of the pre and post-intervention results obtained with the NRS. Please  
 214 note that the NRS scale was introduced at a later point after the start of the clinical pilot program. This is why  
 215 the number of the collected is 30, but the total number of participants is 122 (a) This bar chart shows the  
 216 perceived level of anxiety before and after the group sessions. **A lower score indicates less perceived anxiety.**  
 217 (b) This bar chart shows the perceived level of stress before and after the group sessions. **A lower score**  
 218 **indicates less perceived stress.** (c) This bar chart shows the perceived level of mood before and after the group  
 219 sessions. **A higher score indicates a better perceived mood.** (d) This bar chart shows the perceived level of

220 restfulness before and after the group sessions. A **higher score indicates a better perceived feeling of**  
221 **restfulness.** (e) This bar chart shows the perceived level of motivation before and after the group sessions. A  
222 **higher score indicates a better perceived motivation.**

## 223 Discussion and conclusions

224 Parents in the NICU face many challenges that may  
225 have potential negative and long lasting mental health  
226 implications. These challenges put not only at risk the  
227 individual wellbeing of mothers and fathers, but might  
228 also affect the evolving relationship with their baby  
229 [1,10-12].

*"A state of wellbeing is easily achieved with music therapy. Being in the NICU is stressful, but it becomes tolerable with this type of support."  
(Participating mother)*

230 While the recent shift in NICU music therapy towards a more inclusive  
231 approach of parents is highly desirable, studies that focus on relevant parental  
232 outcomes are still scarce [50]. Also, parents' needs should be understood as both  
233 connected to and distinct from their babies' progress  
234 and treatment. The music therapy self-care group at the  
235 Clínica de la Mujer was implemented to consciously try  
236 to address some of the most common psychological  
237 challenges for parents, including stress, anxiety, mood,  
238 restfulness, and motivation. The group sessions provide  
239 a space for parents to work on their personal wellbeing using simple and  
240 transferable tools relevant for trauma amelioration, resilience and coping. Both  
241 mothers and fathers report a decrease in perceived levels of anxiety and stress, and  
242 an improvement in mood, relaxation and restfulness after the interventions.

*"It is a great space because it allows us to rest and disconnect from the situation we are going through."  
(Participating father)*

243 Although no data was collected regarding our  
244 initial motive to reduce maternal stress and anxiety  
245 during breast milk extraction, a limited number of  
246 articles report a positive impact of recorded music on  
247 breast milk quantity and quality [46,47]. It has been  
248 documented that both recorded and live music in the  
249 NICU can reduce parental stress and anxiety and promote relaxation  
250 [27-30,34,51,52]. For the music therapy self-care group, live music was considered  
251 best practice due to the flexibility and ability to adapt the music depending on the  
252 parents' responses and current needs. Moreover, live music allows for a group  
253 dynamic in which participants can interact and share their experiences with one  
254 another. Knowing that information sharing is at the core of FCC principles [21,22],  
255 the music therapist regularly encourages and facilitates participants to share their  
256 experiences after the intervention and to use the space to build a support system  
257 amongst one another. Considering the 'collective' nature of Colombian society,

*"It is a relaxing activity. It should be done more frequently. It allows us to alleviate the stress from this situation."  
(Participating mother)*

258 active participation of parents was considered to be more culturally appropriate  
259 than individually using recorded music.

260 Understanding the process parents face in the NICU is complex. Although, the  
261 group specifically addresses areas that are commonly mentioned by parents and in  
262 pediatric healthcare literature, wellbeing is influenced by many different factors,  
263 making it difficult to define and measure [49]. Although this article highlights a  
264 clinical practice program, it hopes to provide further insight that may be beneficial  
265 for the development of culturally suitable interventions that specifically address  
266 parental wellbeing. Lastly, the pilot program aims to develop a research protocol in  
267 the near future to better assess the impact music therapy may have on parental  
268 mental health and on mother breast milk extraction.

269

270 **Author Contributions:** Authors declare equal contribution for this article.

271 **Funding:** This research received no external funding.

272 **Acknowledgments:** The authors are thankful to all the parents participating the group sessions and to the  
273 NICU staff and hospital's administration for supporting this initiative.

274 **Conflicts of Interest:** The authors declare no conflict of interest.

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