

Effect of Music Therapy Applied to Interaction Between Moderate-Late Premature New-Born and Their Parents in a Neonatology Unit

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ABSTRACT

Few studies on music therapy in the hospital setting delve into its influence on the early development of the neonate in interaction with their primary caregivers. The study aims to assess the effects of a live music therapy session applied in a Neonatal Intermediate Care Unit (NICU) for late-moderate preterm infants and their families. This is a quasi-experimental study of a cohort of 44 pairs of late-moderate preterm infants and their parents, exposed to music therapy in the first 2 weeks after birth. There are 3 observations moments (before, during and after the intervention), in which Heart Rate (HR), Oxygen Saturation (OSA₂), level of behavioural-emotional activation of the infant and environmental response were measured. A statistically significant increase in OSA₂ ($p < 0.001$) was observed after the intervention, as well as a decrease in HR ($p < 0.001$). In the COMFORT scale, the downward trend in the level of tension was notable ($p < 0.001$) in the behavioural variables, statistically significant differences were found with respect to the beginning of the test in the category of smile in sucking. A decreasing trend was observed in the level of environmental and parental stress ($p < 0.001$). The effects of this intervention applied in the intermediate neonatal units at the moment of interaction between parents and late-moderate preterm infants lead us to conclude that its use is associated with the reduction of stress in the hospital context and the facilitation of adult-baby interactions, a fundamental tool for the establishment of healthy bonds.

Keywords: Music therapy; Preterm infants; Neonatal care; Developmental Postnatal Care (DPC); Integrative medicine

INTRODUCTION

Prematurity implies a series of neonatal conditions that can limit the sensory-motor development [1]. Piaget's work from the 1930s on development cognitive development of the baby marked a before and after in the knowledge about this stage childish. From the 70's onwards there was a boom in this field in which the interest in adult-infant interaction [2]. Mellier (1999) inserts his research by joining these two margins. Goes deeper into the study of cognitive variables (attentional and sensorimotor) of premature children, detecting a lower amplitude and speed in alternating gaze at the other [3]. Taking into account the conditions of the environment that receives the premature baby and its particular bond with the parents, it is worth asking if the pattern that this author describes is the result of maturation or the particularities of the context where it develops. Mellier's description of the capacity of attention, very sensitive to the sensory-motor aids that facilitate the

construction of that translates to first neuro-sensory-motor regularities, would guide more towards the explanation of the context determinism [2]. If the context of the premature infant admitted to the NICU is analysed context determinism [2]. If the context of the premature infant admitted to the NICU is analysed attentional behaviours expected in a neonate: The absence of congruence between stimulations available from the incubator, the weak tonic reactivity that mortgages the perceptual adjustment and the lack of opportunity to perform intermodal treatments of the information will result in a nutritive lack of sensory-motor skills [2].

When we broaden our view of relationship patterns, we appreciate that the high level of stress in the hospital context (both for the neonate and its parents) and the time of early separation from attachment figures accentuate the pattern of rhythmic dysregulation in adult-newborn interaction [4,5]. If you don't do the right things adjustments, the

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baby's contact with the adult may be reduced to technical adjustments and a painful stimulation. If this situation continues over time, the rate will increase cardiac, oxygen variation and oxytocin [1]. This may result in establishment of a risk link [6]. Recent studies analyze the alterations biochemistry associated with stress and the rhythmic quality of the interaction with its caregivers and detect that the low degree of synchrony between adult and baby correlates with low levels of oxytocin and high levels of cortisol [7]. It can be concluded that for the health of the premature not only physical care is required. It is necessary to detect the factors of risk and minimize them, while better knowing and promoting a stable and consistency of the stimulation packages and adequate contact between adult and new-born. The Developmentally Centered Care (DCC) approach in neonatology takes into account of this and proposes technical adjustments to limit these risk factors [7].

While we detect and limit risk factors, it is important to promote the presence of proven protective factors such as the presence of parents in the care of these units. Preterm new-borns have a curve of weight growth slower than a full-term baby, hence the importance of taking care of feeding [1]. However, even more important than weight is the evolution of tone muscle, alertness and response to different stimuli [1]. Most of parents are unaware of this and focus their care on their diet, becoming distressed a lot when your child doesn't eat enough and seeing the baby so helpless many parents they feel helpless and with the sensation that nothing is within their reach, blocked without access to their resources. But what they need is to wait, stay by of the baby observe him and learn that his children have their own rhythm of adaptation, development and growth. It is important to accompany them to discover it through it interaction with your child, for which an intermediary task such as the rhythmic-sound-musical. During this interaction parents will learn that babies they have rhythms of attention-inattention and activity-passivity biologically conditioned, which favours that their behaviour can be anticipated by those who they care, facilitating interaction.

Research in music therapy shows that it is possible to reduce threats described when the music therapist acts as a mediator who organizes the environment, by integrating multimodal stimuli and facilitating the opening of channels communicative/emotional that allow more satisfactory encounters to occur between the baby, the adult and the medium [8,9]. These interventions on the environment and its rhythms they promote the relationship between the baby and its caregiver; since rhythm is a component musical that facilitates the expression of emotions with the help of tone and movement bodily [9]. The importance of the caregiver's sensitivity in the constitution is known child's social [10]. Likewise, the difficulty of parents in the first weeks to understand the child's reactions. However, if you look at their rhythmic reactions as signals, whether internal or external and the response is adjusted to their emotional level or activation, a space of communicative coherence will be created in which to meet of in this way, the impulses that regulate the rhythm and harmony of the movement will circulate between the adult and the child through the same action [11,12]. Your feedback will generate communicative exchanges. The medium, as indicated, can facilitate or make this exchange difficult; being a facilitating context, if it favours the rhythm of the actions, gestures and vocalizations are shared between adult and baby and their tuning according to the child's development [13].

Despite all this evidence, intervention effectiveness studies preventive measures that foster environments that are more sensitive to premature babies, fail to objective size successfully the expected relational changes

[10-16]. And show low sensitivity to differences between preterm and typical population, both in the level of synchrony achieved, as in the experience of abandonment of these children [17,18] and the thing is, most of these studies analysed adult-infant dyadic interactions (subject-subject), minimizing or denying the importance of the object in these first moments that some call of primary intersubjectivity [19]. There are few works that address the first interactions that also include an object that is used as third element through and about which to communicate [19-24]. Given the limits of the studies raised until now, our proposal aims to highlight the importance and usefulness of the object to clarify the relational variables; at the same time, the object is claimed as one more member of the same interaction twenty. For this we will start from the theories materialists about language and we focus on the pragmatic perspective of object twenty [25,26].

With this background approach, this study aims to analyse the effects of music therapy on the child moderate late preterm, the adult who accompanies and the same hospital context [27]. Since at this time it is a population which is growing due to the increased use of assisted reproductive techniques and the increase of the survival of low weight babies, it is hoped that the results can help in guiding parents, preventing future problems by providing resources according to the prognosis and consequently to improve the well-being of the baby [28]. Indirectly, it will be contributing to reducing health expenditure, by minimizing hospitalization time and subsequent interventions.

MATERIALS AND METHODS

Study design

The objective of this study was to measure the response to the intervention music therapy for premature babies, both physiological Oxygen Saturation (SAO₂) and Heart Rate (HR) and behavioral according to the COMFORT scale¹ and emotional indicators such as smiling, attentive gaze, crying, sleeping and sucking of their parents (level of emotional tension) and the emotional climate of the care room neonatal intermediates (noise and environmental stress-bustle).

Our hypothesis stated that the aforementioned musical intervention, during the parent-child interaction in the neonatal unit of the La Paz Hospital would improve well-being of moderate-late preterm new-borns and would reduce environmental stress in it boxes of neonatology, as well as adult stress. Improving the well-being of infant would be evidenced by a statistically significant increase in blood saturation oxygen, greater relaxation and greater frequency of appearance of satisfaction behaviours (such as smiles, more attentive gazes and increased frequency of sucking) and a decrease statistically significant increase in infant stress (decrease in frequency heart rate, COMFORT scale scores and crying frequency). This expected improvement should be associated with the rhythmic intervention.

This is a quasi-experimental study of a premature cohort (n=44) and their parents exposed to the rhythmic, instrumental and vocal music therapy intervention of proven effectiveness which we will describe below [6]. A control group was not used, prioritizing the clinical and ecological values of the unit. The sample was not even randomized, given the difficulty of accessing this sample one week after birth before discharge.

Sample characteristics

In the consecutive sampling between October 2015 and May 2016, a total of 44 subjects, after having detected more than 150 subjects who

met criteria for inclusion. The final sample of premature babies has the following profile: 73% males, 50% first-borns (40% twins), 73% natural fertilization, 50% born through childbirth twins, 68% delivered by caesarean section, which in 38% of cases required revival and 15.9% with moderate physical problems. The parents are of average age 35 years old, medium socioeconomic status, predominantly of Spanish origin (83%) and the rest mainly Latin Americans; 52% have higher education, 36% medium and 11% basic; 16% with advanced musical training. They predominate high self-esteem scores on the Rosenberg Test (1989) (by 77%); he 45.5% obtain low scores in secure maternal self-image and 41% show certain difficulty in recognition, although feelings and reactions predominate positive (72% and 52% respectively) according to the Corporate Learning Improvement Process (CLIP) interview (2003) of what I know deduces a clear desire to be parents but, perhaps due to the conditions of this birth unexpected early, they appear insecure and ambivalent towards the baby [29,30].

Procedure

This study was coordinated with the head of the neonatology medical and nursing service, the HULP and IdiPaz research committee in the period from October 2015 to May 2016. Once the cases were detected and the parents were informed, their signature was collected on the consent sheet approved by the HULP committee (PI-2136; Minutes: 11/18/2015). Subsequently, music therapy interventions were carried out by music therapists. Experts in the same boxes of the neonatology unit of the La Paz hospital where the premature baby was with his parents and other hospitalized patients. Each of the sessions they were filmed. These interventions were carried out one by one, always in interaction with the corresponding parents and divided into three moments: 1. Instrumental improvisation; 2. Singing a lullaby in interaction with families and 3. Accompaniment to an improvisation with a maraca by parents as a facilitator of participation active parenting.

During the session the evaluator recorded the variables of measured before (5 minutes before the intervention), during (5 minutes after its start) and after the music therapy intervention (5 minutes later) (Figure 1).

Material

The musical instruments used were: keyboard, flute, guitar, others string and percussion instruments (of low frequency of use), as well as the maraca used by parents in t3. At the three observation moments (before, during and after the intervention) heart rate, oxygen saturation (monitored by box pulse oximeter), the level of behavioural activation (according to the COMFORT test, 2005 at the levels active, passive, dreaming, stable, regulating, with stress/agitated laughter, smile, crying, attentive gaze and sleep and the registration of the presence/absence of the categories laughter, smile, crying, attentive gaze and dream in a replica of the Del Olmo studio, 2008), as well as the pace used and the level of environmental tension (noise, tension, number of participants, evaluated during the session and categorized after viewing the shooting) [31,32]. Once the intervention was completed, an interview was carried out with the parents to collect the sociodemographic and clinical variables and impressions about the intervention and they applied several standardized tests: Rosenberg self-esteem test (1989) for eleven adults and the CLIP (1993), clinical interview for parents with children born in risk situations [29,30].

They would later view the recordings the rhythm used would be

analysed and followed by the parents, the physiological responses and the COMFORT test, the presence/absence of sucking and other behaviours such as smiling, sleeping, crying and look at the mother, as well as environmental and parental responses; for this used the SPSS 19 software program (2010), using comparison tests of groups and correlation [33].

RESULTS

This section will show the data analysed from the musical intervention and the effects of the same.

The musical intervention was characterized by: (1) Statistically significant change in rhythm ($p < 0.001$) between t1-t3 and t2-t3 (Table 1); (2) Prevalence of the use of the keyboard and flute (48%), compared to the keyboard alone (37%), the guitar (12%) and other percussion instruments also participating (9%); (3) Accent change with significant differences between t1-t2 ($p = 0.0007$) and t1-t3 ($p < 0.001$) (Figure 2). In t1 the binary accent predominates, equalling in t3; (4) The level of participation of family members was high: 98% of parents who supported the child agreed to participate in the musical proposal of them 72% they used the maraca. When there was an accompanying family member (in 68% of the total), the 50% of these ended up participating as well. At t2 the parent who was holding the child in 86% of the cases sang with the music therapist and in the case of the companions in 73% of the total, in t3 they accompanied 90% of the maracas with the maraca those who supported the child and 85% of the cases of the companions. I don't know found significant differences depending on the time of the intervention.

The effect of the intervention showed the following particularities

There was a statistically significant change in the SAO_2 variable after the intervention of ascending trend with significance statistics between moments t1-t2* (3, 7; 95% Class Interval (CI)=0.6-6.8; $p = 0.008$), t1-t3* (3, 4; 95% CI=0.56-6.36; $p = 0.01$) and t1-t4* (3.8; 95% CI=0.59-7.04; $p = 0.011$) and statistically significant decrease in HR ($p < 0.001$) between t1-t4* (10; 95% CI=1.5-18.7; $p = 0.012$) and t4-t5* (6; 95% CI=0.9-18.7, $p = 0.011$) (Figures 3 and 4).

In the responses to the COMFORT test there is a tendency towards a lower level of tension with statistical significance ($p < 0.001$) between t1-t4 and t2-t4 in almost all factors, except between the percussion intervention and the end of the intervention (t3-t4), at which time a certain elevation is detected in the alert and tension pattern (Table 2). In the item-by-item assessment we see the child's response in more detail.

In the behavioural variables (Table 3) only differences are found significant in the category milein the first moments of intervention t1-t2 (18; $p = 0.008$) and t1-t3 (19; $p = 0.004$).

A suction pattern is observed in 100% of the cases in t1, in 98% in t2 and in 93% in t3. In t1 only 4% appear tense or in 10%, partially tense.

The categories of the environmental situation (tension, noise) and the adult reveal downward voltage trend with significant differences at compare environmental stress before-after ($p < 0.001$) (McNemar), without significant differences in noise and adult stress (Tables 4a-4c and Figure 5).

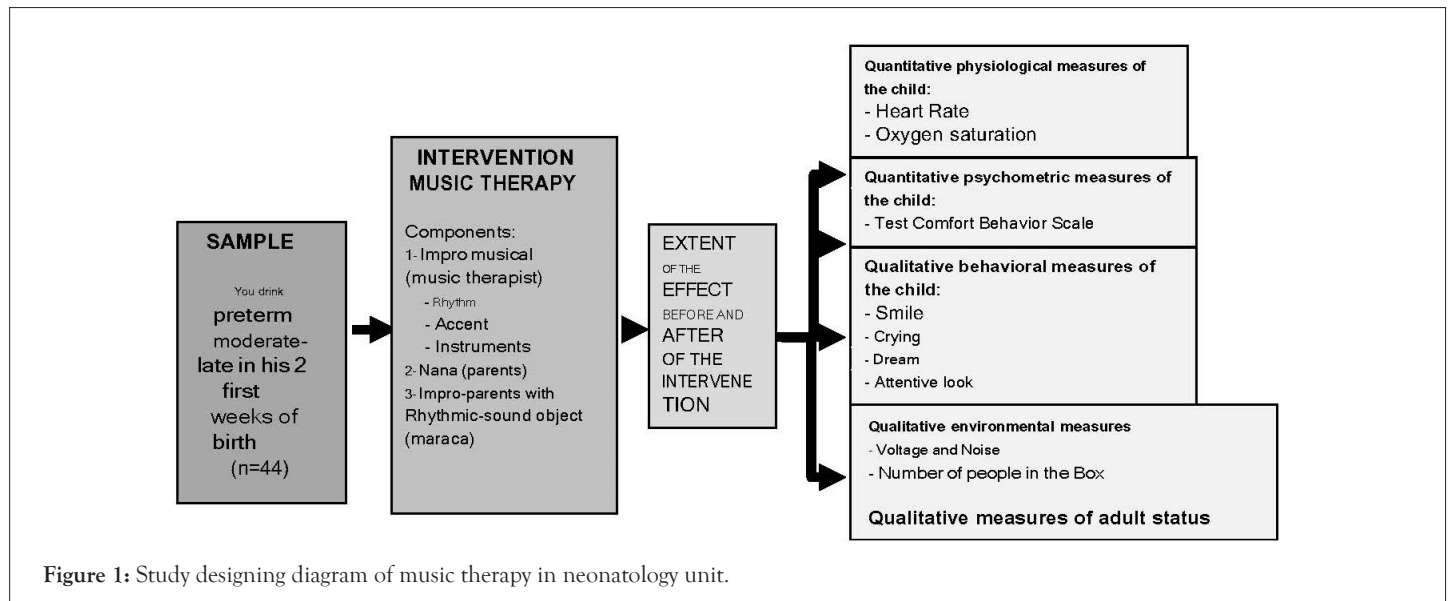


Figure 1: Study designing diagram of music therapy in neonatology unit.

Table 1: Descriptives of the rhythm of the music therapy session in its three phases.

	N	Half	T deviation	Median	Minimum	Maximum
Rhythm						
Improvisation (s1) (beats/min)	44	72.32	15,730	70	4.5	116
Lullaby rhythm (s2) (beats/min)	43	82.56	26,303	80	38	135
Maraca rhythm (s3) (beats/min)	41	108.56	18,319	105	69	146

Note: N: Total frequency.

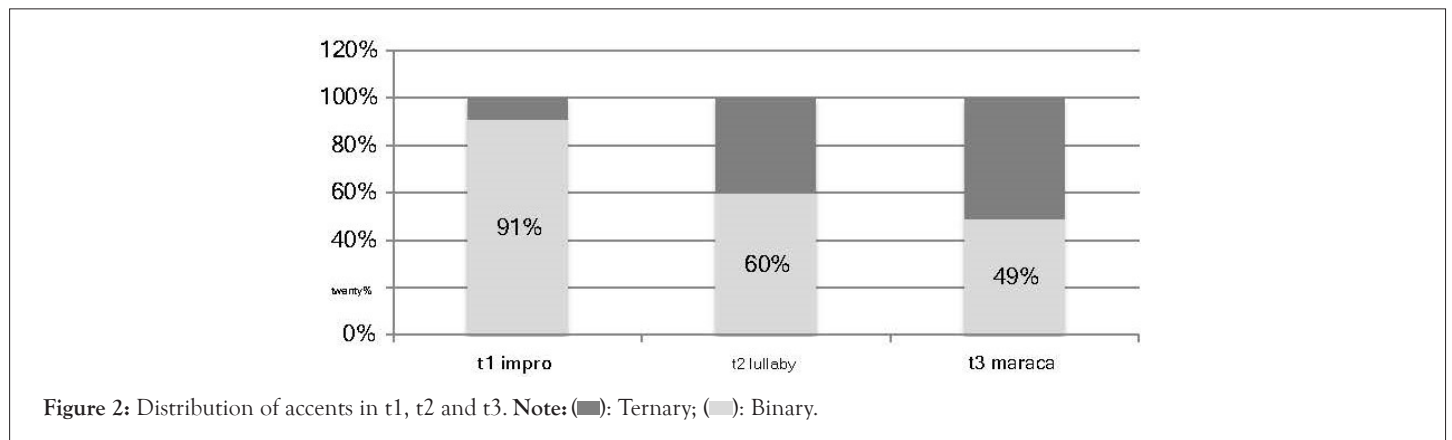


Figure 2: Distribution of accents in t1, t2 and t3. Note: (■): Ternary; (□): Binary.

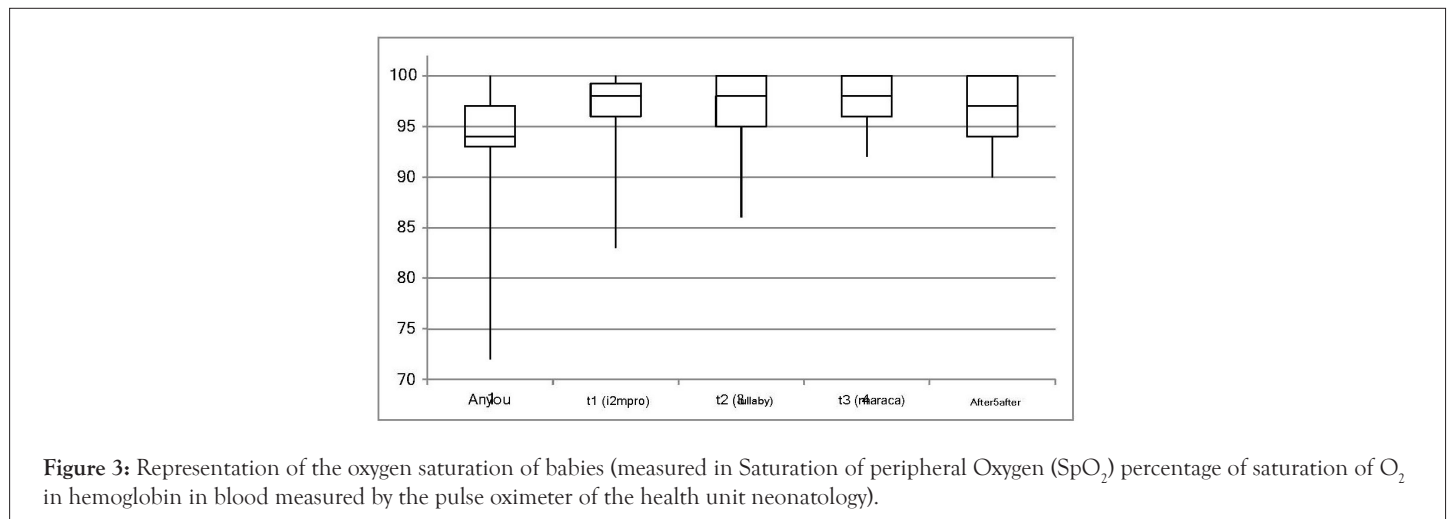


Figure 3: Representation of the oxygen saturation of babies (measured in Saturation of peripheral Oxygen (SpO₂) percentage of saturation of O₂ in hemoglobin in blood measured by the pulse oximeter of the health unit neonatology).

Table 2: Distribution of items and global score of the Comfort Behavior Test (CBT).

Comfort behavior overall score scale (CBT)					Item 1 distribution (CBT): Alert level			
T	t1	t2	t3	t4	t1	t2	t3	t4
Half	8.34	9	8.22	6.02	2.4	2.6	23	1.6
OF	3,970	2,579	2,613	1,649	1.1	0.8	0.9	1.06
Distribution item 2 (CBT): Muscle tone				Distribution item 3 (CBT): Agitation				
T	t1	t2	t3	t4	t1	t2	t3	t4
Half	1.8	1.9	1.8	1.4	1.2	1.09	1	1
OF	1.1	0.8	0.8	0.9	0.54	0.3	0	0
Distribution item 4 (CBT): Movement physical				Distribution item 5 (CBT): Facial tension				
T	t1	t2	t3	t4	t1	t2	t3	t4
Half	1.6	1.8	1.6	1.1	1.3	1.6	1.5	1
OF	1.1	0.9	0.8	0.4	0.8	0.8	0.79	0.2

Note: CBT: Comfort Behavior Test; SD: Standard Deviation; t1-t4: Moments of observation. This scale, which assesses the level of sedation and discomfort of the child, is made up of 6 items: Level of alertness, muscle tone, agitation, physical movement, tension facial and respiratory response; The latter only used in mechanical ventilation situations. Rated from 1-5, minimum to maximum tension. Values less than 10 reveal levels of relaxation or sedation and values greater than 17 reveal discomfort and possible pain.

Table 3: Distribution of the communicative and emotional behaviors observed.

Attentive look								Smile*								
T	t1		t2		t3		t4		t1		t2		t3		t4	
	Yeah	No	Yeah	No	Yeah	No	Yeah	No	Yeah	No	Yeah	No	Yeah	No	Yeah	No
F	8	36	16	28	15	29	5	39	7	37	19	25	20	24	7	37
%	18	82	36	64	3.4	66	11	89	16	84	43	57	4.5	55	6	84
Crying								Dream**								
T	t1		t2		t3		t4		t1		t2		t3		t4	
	Yeah	No	Yeah	No	Yeah	No	Yeah	No	Yeah	No	Yeah	No	Yeah	No	Yeah	No
F	4	40	0	44	3	41	0	44	36	8	3.4	10	33	11	38	6
%	9	91	0	100	7	93	0	100	82	18	77	23	75	25	86	14

Note: (*): It is not about the social smile, but the reflexive one; **Sleep: Sleeping most of the time which is sometimes combined with brief attentive looking.

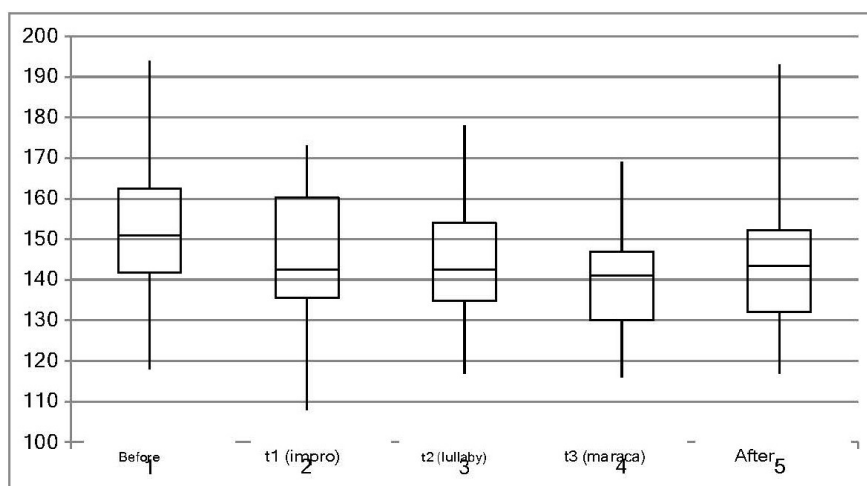


Figure 4: Representation of the heart rate of babies (measured in Beats Per Minute (BPM) measured by the pulse oximeter of the neonatology unit).

Table 4a: Distribution of the start environmental stress (t1) and the end stress (t4).

Initial box voltage (t1)				Box final voltage (t4)			
1	2	3	Total	1	2	3	Total
13	19	12	N=44	36	8	0	N=42
29.50%	43.20%	27.30%	100.00%	81.80%	18.20%	0%	100%

Note: N: Total frequency; Scale for measuring environmental tension: (1): Little activity; (2): Moderate activity; (3): Intense activity.

Table 4b: Distribution of start noise (t1) and end noise (t4).

Initial noise of the box (t1)				Final box noise (t4)			
1	2	3	Total	1	2	3	Total
15	16	13	N=44	30	12	2	N= 44
34.10%	36.4%	29.5%	100.0%	68.20%	27.3%	4.50%	100.0%

Note: N: Total frequency; Environmental noise measurement scale: (1): Little noise; (2): Moderate noise; (3): Intense Noise.

Table 4c: Distribution of adult tension at the beginning (t1) and end (t4).

Initial tension of the adult (t1)				Final tension of the adult (t4)			
1	2	3	Total	1	2	3	Total
16	23	5	N=44	42	2	0	N=44
36.4%	52.3%	1.4%	100.0%	95.4%	4.5%	0%	100.0%

Note: N: Total frequency; Adult statement scale: (1): Not very relaxed; (2): Partially; (3): Very relaxed.

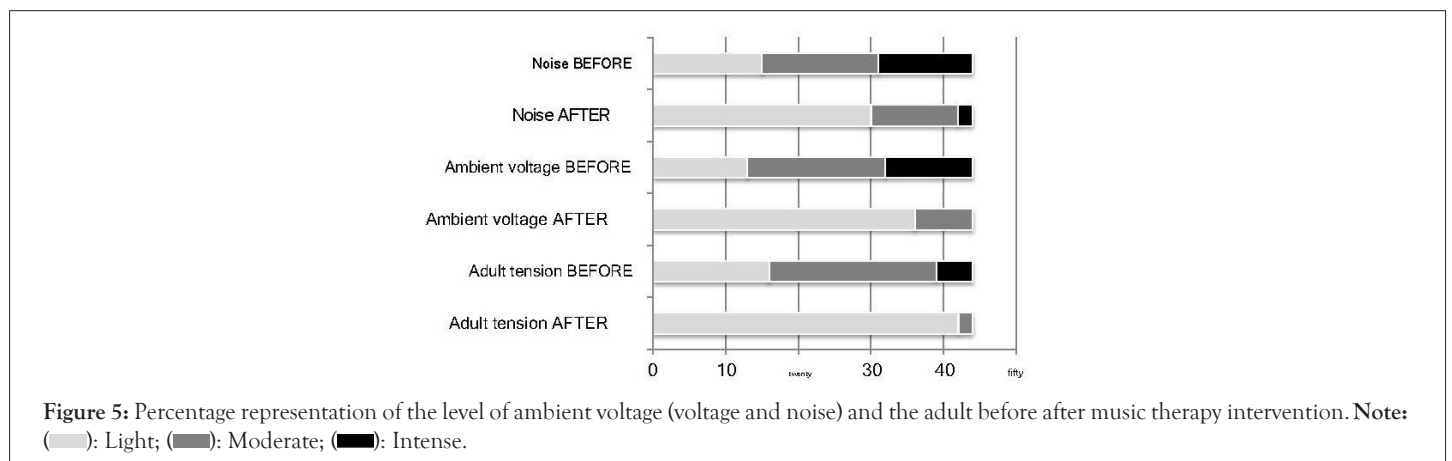


Figure 5: Percentage representation of the level of ambient voltage (voltage and noise) and the adult before after music therapy intervention. **Note:** (□): Light; (■): Moderate; (■): Intense.

After the correlation analysis, it is seen that the behavior of the frequency cardiac has a certain relationship with the rhythmic pattern of the first moments (significant between t1-t2) (rRHYTHM t1-HR t2=-0.4; pRHYTHM t1-HR t2=0.003; rRHYTHM t1-HR t3=-0.4 and pRYTHM t1-HR t3=0.007) (Pearson); so also in the pattern of physical movement (t1 and t2) (t1-t3) (rRHYTHM t1-MOVM t1=-0.33; pRHYTHM t1-MOVM t1=0.028; rRHYTHM t1-MOVM t2=-0.37 and pRHYTHM t1-MOVM t2=0.011) (Spearman's rho). These correlation tests revealed association between some of the improvement patterns observed (in HR and movement) and the rhythmic pattern proposed in the music therapy intervention.

DISCUSSION

The results show that the moment after this intervention music therapy is associated with an increase in the degree of relaxation of the moderate late preterm infants. Which coincides with our hypotheses and conclusions from other studies [34-38]. On the

one hand, taking into account the physiological response pattern, decrease in HR and increase in SAO₂ observed, we can conclude that this type of intervention seems useful for promoting the breathing development of these babies who frequently present apnea in these early stages [1]. Also flattering of the establishment of the first available cognitive processes; since the frequency heart rate is associated with different levels of care establishment sustained on a novel stimulus [39,40]. Which is accompanied by HR deceleration, increased level of attention, reduction of movements and respiratory rate.

The effect on the level of activation observed in the COMFORT scale is consistent with the FC pattern and with the idea that this intervention seems to favour the fifteen reduction of tension and well-being in premature infants, coinciding with what was observed in previous studies [6,32]. The communicative and emotional behaviours analysed coincide in highlight the baby's satisfactory response to the intervention, with the presence statistically significant increase in smiling and sucking, in addition to the infrequent appearance crying

and progressive tendency to decrease body tension. This guides us to think that the intervention attracts the interest of the premature babies analysed and helps them to calm down, without generating too much activation. This response pattern coincides with the results found in other investigations [6,32,34].

On the other hand, it can be seen that the intervention right at the moment of the interaction between the premature baby and his parent favoured the establishment of communicative routines between child and caregiver (such as turn-taking interaction, calm and sensitive response to the child's expression, the inclusion of the emotional in the interaction, the facilitation of situations that allow joint actions, prelude to joint attention, etc.) and the reduction of the tension pattern of the same relationship context, as also predicted our hypotheses. It is worth remembering that children have attention-inattention rhythms and biologically conditioned activity-passivity [39,40]. This encourages their behavior can be anticipated by caregivers, facilitating interaction. Adults adapt to this periodicity creating exchanges in which a true interaction is reached by turns [4,41]. Some studies on premature babies highlight the difficulty of parents to identify these signs and adjust to the rhythm of the behavior of these children [4,42]. Without However, in the videos of the musical interventions it is observed that the first interactions between the adult and the premature baby, mediated by the music therapist. They can be reciprocal and rhythmic. In other research on care units neonatal intensive care units it has also been shown that attending to the natural rhythms of the babies and acting coherently enables better adult-baby interaction and favours the organization of action [43].

In general, the results confirm part of these approaches and show that it seems evident that music tames (the premature), associated with the reduction of heart rate and increase in oxygen saturation, patterns more relaxed body movements and the presence of psychological organizers, such as the smile and the decrease in agitation and crying behaviours. The presence of these patterns promotes well-being and more satisfactory joint actions (e.g., in routines of feeding, containment and promoting rest). These conclusions seem connect with the idea that through music the organization of cognitive processes and, depending on the frequencies (musical tones) used, changes to be induced at neurophysiological, emotional and/or motor levels [40]. However, It should be noted that, although our statistical instruments associate some of these variations with pace, particularities of research design and instruments of analyses chosen do not allow establishing a causal relationship between the changes observed and the musical proposal. The mediating factors are numerous and determine their sequence and relationship is complex. We need to continue optimizing our tools observation, recording and analysis, if you want to demonstrate in detail the way in which the music acts as a mediator in this risk context. Taking this into account, our impression is that the rhythmic patterns offered by the music therapist can be integrated in the context and produce environmental changes in both the noise level and hustle and bustle of the context, require more evidence. As the actors involved are incorporating these patterns (going from a situation of high intensity and movement to a gradually tighter one), adult caregivers. They claim to notice benefits (verified in gestures and body positions) and when they finish report a favourable subjective impression, describing the session as a help for enjoyment, the expression of emotions and relaxation. It should be added that the accompaniment instrumental (t1) and vocal (t2) seems to facilitate the participation of all present, not only of the families analysed. In some sessions, the musical activity has promoted more active interaction between families of diverse status and origin. Share a space, a moment and a musical theme has given

rise to a common task, despite differences and cultural diversity. These situations have led to a more climate relaxed and supportive, where each of those present are potential agents of integration and equity.

Despite all these satisfactory observations appreciated during the intervention, our data do not show a statistically significant difference post-intervention in the parental stress and in the noise of the environment, perhaps due to the low sensitivity of the measures used and the chosen analysis instrument. So occurs with many other studies consulted [14-16]. It would be necessary to review the instruments of measure used especially those that measure the level of stress observed in parents and the variable noise and voltage environmental. Also look for other design options experimental that help improve statistical power. On the other hand, the inclusion of a sound object at the end of the session (t3) that seems to be a good complement to encourage the participation of parents in the intervention, supported by the pragmatic perspective of the object twenty, is an original proposal that limits the possibility of comparison with other studies. For this reason, it is advisable to continue analysing the degree of usefulness of its use and minimizing its possible interference in the interaction in these first weeks.

Finally, it is worth highlighting the practical contributions of this study: The objectification of the usefulness of these music therapy interventions that accompany parents to approach, not only the appropriateness of care, but also the warmth and coherence of the response to the new-born's action. Attention to rhythm facilitates adjustment and satisfaction of joint action, allows exploring the capabilities that the premature and promotes caregiver-neonate communication. Say it is necessary, but accompany to do expands the possibilities of what has been said, by offering us experimentation as a space of discovery with the other [44]. At a time when the humanization of hospital contexts is an important objective, they are necessary research that, based on practice, offers answers on how to do so promote development in a healthcare context.

CONCLUSION

Being born premature does not have to imply illness or disability, but it is a factor of risk for the development of the baby and the establishment of a healthy bond with its parents. The degree of development of the premature baby not only depends on its physical maturity, time of gestation and medical complications, but also the possibilities of interaction that the context offers to the neonate, which allows the construction of new experiences. This idea is common to constructivist approaches in child psychology. Development for which the child's cognitive ability is not a starting point, but the result of the construction of an active subject that transforms the environment and by doing so transforms itself.

The particular situation of interaction that is offered during the intervention of music therapy in the Neonatal Care Unit (NICU) of the La Paz Hospital, where the music therapist creates a rhythmic pattern as a prelude to vocal and gestural interaction with a sound object starring one of the parents, it is a space of experimentation showing a significant decrease in activation level and an increased degree of relaxation in moderate-late preterm infants. In turn, it favours the establishment of routines between the neonate, its caregiver and the context of relationship. This experience allows interaction with objects in the environment, which favours that adults adapt to the periodicity of the first interactions creating exchanges in which interaction begins in turns. In this way, the rate of use of objects not only provides information about the emotional state, but also allows the organization

of action, thus promoting multimodal communication that it is the basis of human interaction and communication, the starting point for construction of joint attention. The novelty of this work lies right in the last phase of the intervention, which includes adult-infant interaction through an object sound (maraca) as a modification in the most common musical intervention, composed of an instrumental and vocal improvisation.

The results of this research not only represent a contribution in the field of psychological development of premature babies, but may have implications for the intervention of the hospital services specialists in perinatal mental health, as well as in early care services in a more outpatient setting. This knowledge of the new-born in interaction with its parents, in a sensitive environment that favours emotional expression and the well-being of families is what should determine making decisions about possible future interventions and supports. According to this idea, the observation of music therapy intervention is more than a help for parents, can be an evaluation tool that is integrated within the intervention team can improve the quality of the care process and especially the orientation of the care for discharge. Along these lines, it would be necessary to incorporate these improvements to the units of neonatology in a more systematized way. For the latter, it will be advisable to follow delving into the analyses of this intervention, exploring the possibilities of systematization and customization in intensive processes, and perfecting the design and analysis instruments.

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