

EFFECT OF MUSIC THERAPY ON VITAL PARAMETERS, ANXIETY AND SENSATIONS EXPERIENCED IN THE GESTATIONAL PERIOD

EFEITO DA MUSICOTERAPIA SOBRE OS PARÂMETROS VITAIS, ANSIEDADE E SENSações VIVENCIADAS NO PERÍODO GESTACIONAL

EFFECTO DE LA MUSICOTERAPIA EN PARÁMETROS VITALES, ANSIEDAD Y SENSACIONES EXPERIMENTADAS EN EL PERÍODO GESTACIONAL

Ana Carolina Almeida Pereira¹
Viviane Cordeiro de Queiroz²
Smalyanna Sgren da Costa Andrade³
Ana Carolina Dantas Rocha Cerqueira⁴
Vagna Cristina Leite da Silva Pereira⁵
Simone Helena dos Santos Oliveira⁶

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Objective: to evaluate the effect of music therapy on the vital parameters, anxiety and sensations experienced during the gestational period. **Method:** mixed intervention before-after study, conducted with 30 pregnant women who attended a school clinic and in the university extension project. Sociodemographic characterization form, state anxiety scale, vital parameters and semi-structured interview script were used. The data were analyzed by descriptive statistics, inferential and thematic content analysis. **Results:** there was an improvement in pulse frequency ($p < 0.000$), breathing ($p = 0.002$), heart rate ($p < 0.000$) and oxygen saturation ($p = 0.002$) evidencing the effectiveness of music on those vital signs. **Conclusion:** pregnancy generates possible negative sensations that can influence the emotional state, and music therapy promoted a positive impact, as it favored the reduction of the degree of anxiety, had repercussions on the child's mobility and had a significant effect on the improvement of pulse, breathing, heart rate and oxygen saturation.

Descriptors: Music therapy. Anxiety. Vital Signs. Pregnant Women. Nursing.

¹ Nurse. Specialist in Obstetric Nursing. João Pessoa, Paraíba, Brazil. <http://orcid.org/0000-0002-2949-1988>.

² Nurse. Specialist in Obstetric Nursing. Faculdade Instituto Brasil de Ensino. João Pessoa, Paraíba, Brazil. vivicordeiroqueiroz35@gmail.com. <http://orcid.org/0000-0002-2037-921X>.

³ Nurse. PhD in Nursing. Professor Assistant at the Faculdade de Enfermagem Nova Esperança. João Pessoa, Paraíba, Brazil. <http://orcid.org/0000-0002-9812-9376>.

⁴ Nurse. PhD in Nursing. Professor at the Faculdade de Ciências Sociais Aplicadas. Campina Grande, Paraíba, Brazil. <http://orcid.org/0000-0001-5782-3102>.

⁵ Nurse. PhD in Nursing. Head Professor at the Universidade Federal da Paraíba. João Pessoa, Paraíba, Brazil. <http://orcid.org/0000-0002-8831-3620>.

⁶ Nurse. PhD in Nursing. Head Professor at the Universidade Federal da Paraíba. João Pessoa, Paraíba, Brazil. <http://orcid.org/0000-0002-9556-1403>.

Objetivo: avaliar o efeito da musicoterapia sobre os parâmetros vitais, ansiedade e as sensações vivenciadas no período gestacional. Método: estudo de intervenção mista antes e depois, realizado com 30 gestantes atendidas em clínica-escola e no projeto de extensão universitária. Utilizou-se formulário de caracterização sociodemográfica, escala de ansiedade-estado, parâmetros vitais e roteiro de entrevista semiestruturado. Os dados foram analisados por estatística descritiva, inferencial e análise temática de conteúdo. Resultados: houve melhora da frequência de pulso ($p < 0,000$), respiração ($p = 0,002$), frequência cardíaca ($p < 0,000$) e saturação de oxigênio ($p = 0,002$) evidenciando a efetividade da música sobre estes sinais vitais. Conclusão: a gestação gera possíveis sensações negativas que podem impactar o estado emocional, e a musicoterapia promoveu impacto positivo, pois favoreceu a redução do grau da ansiedade, repercutiu na mobilidade da criança e possuiu efeito significativo na melhora da pulsação, respiração, frequência cardíaca e saturação de oxigênio.

Descritores: Musicoterapia. Ansiedade. Sinais Vitais. Gestantes. Enfermagem.

Objetivo: evaluar el efecto de la musicoterapia en los parámetros vitales, ansiedad y sensaciones experimentadas durante el período gestacional. Método: estudio mixto de intervención antes y después, realizado con 30 mujeres embarazadas atendidas en una clínica escolar y en el proyecto de extensión de la universidad. Se utilizó forma de caracterización sociodemográfica, escala de ansiedad del estado, parámetros vitales y guión de entrevista semiestruturado. Los datos fueron analizados mediante estadísticas descriptivas, análisis de contenido inferencial y temático. Resultados: hubo una mejora en la frecuencia del pulso ($p < 0,000$), respiración ($p = 0,002$), frecuencia cardíaca ($p < 0,000$) y saturación de oxígeno ($p = 0,002$), evidenciándose la eficacia de la música en estos signos vitales. Conclusión: el embarazo genera posibles sensaciones negativas que pueden afectar el estado emocional, y la musicoterapia promovió un impacto positivo, ya que favoreció la reducción del grado de ansiedad, tuvo repercusiones en la movilidad del niño y tuvo un efecto significativo en la mejora del pulso, la respiración, la frecuencia cardíaca y la saturación de oxígeno.

Descriptorios: Musicoterapia. Ansiedad. Signos Vitales. Mujeres Embarazadas. Enfermería.

Introduction

Anxiety is a prevalent characteristic in pregnancy⁽¹⁾, whose rates range from 23% in Canada, 15.0% in Germany to 49% in Pakistan⁽²⁾. A cohort study in Rio de Janeiro indicated 64.9% of pregnant women with anxiety⁽³⁾, a prevalence higher than developed countries. For this purpose, complementary therapies consist of accessible and effective resources to reduce anxiety, which include using music and its elements, such as sound, rhythm, melody and harmony, producing beneficial emotional and clinical effects⁽⁴⁾.

Nevertheless, musical interventions have been shown to be efficient in reducing anxiety in women⁽⁵⁻⁶⁾ and improving fetal conditions⁽⁶⁻⁷⁾, constituting a recommended alternative in the health area in the multidisciplinary scope. In view of the woman's predisposition to psychological distress during pregnancy, the choice of this proposal comes from the possibility of confirming music therapy as a complementary therapy strategy that aggregates in the prevention and/or treatment of emotional changes and vital parameters.

Music therapy is a light care tool that can be added to collective prenatal activities. Thus, the

question is: What is the impact of the gestational process on women? Does music therapy produce satisfactory emotional and clinical responses? Therefore, the objective is to evaluate the effect of music therapy on the vital parameters, anxiety and sensations experienced in the gestational period.

Method

Interventional before-after research, with mixed approach, with pregnant women treated in university extension and teaching-clinic belonging to the higher education institution of a Brazilian municipality. The convenience sample elected 30 pregnant women⁽⁸⁾ with the following inclusion criteria: age over 18 years, educated, with healthy pregnancy and above 20 gestational weeks, generalized time in the obstetric area, such as the period of development of the auditory cortex, responsible for sound processing. Women who were not cognitively-emotionally able (self-reported) and non-educated were excluded.

Data were collected between August and October 2018, containing the characterization

variables (naturalness, age, marital status, religion, ethnicity, monthly income, number of children, division of housing), vital signs of the mother (pulse, breathing, blood pressure, apical heart rate, oxygen saturation) and of the baby (cardiofetal heartbeats).

Moreover, the State-Trait Anxiety Inventory (STAI) was used, validated, adapted and translated to the Portuguese as the *Inventário de Ansiedade Traço-Estado*, which presents two scales: one as a state, that is, momentary anxiety; and another, as a trait, that is, as part of the psychic constitution of the individual⁽⁹⁾.

The scale applied in this study was state anxiety, i.e., state (STAI-S) that evaluated how the pregnant woman was at the time before and after music therapy. In relation to the STAI-S, the 4-point Likert scale ranged from absolutely not, a little, quite and very much. The classification has grades: low (0-34 points), moderate (35-49), high (50-64) and very high (65-80)⁽⁹⁾.

The research was carried out on a previously established date and time, according to the operation of the project and the school clinic. The environment was reserved with air-conditioned room, decorated and low light (presence of luminaire), providing pleasant ambience. The collection was divided into five stages, the first was the embracement of the pregnant woman and the application of a form. After previous contact, at the time of the pregnant woman's arrival in the reserved environment, there was repetition of the objectives and purpose of the study and then the characterization form was applied.

The second stage was the application of the STAI-S and the measurement of vital indicators. The STAI-S was delivered for self-completion of the pregnant woman before the intervention. After these procedures, which lasted an average of 10 minutes, vital signs were measured, considering the need for a rest period necessary to verify the indicators of vital functions⁽¹⁰⁾. This time was important for reliable results and for no interference of physical movement on the measured values.

The first indicator evaluated was oxygen saturation (SatO₂), using the Oximeter portable

finger pulse oximeter, placing the participant's left index finger on the device⁽¹¹⁾. After 10 seconds, time required to be read according to the equipment instruction, the saturation level was noted.

With the participant seated and with the arm supported, there was the evaluation of the radial pulse, placing the forefinger and middle fingers of the researcher on the radial artery, pressing lightly to feel the pulsation. When felt, the beat count was started for one minute, observing the rhythm and frequency. The normal pulse frequency values are 60 to 100 beats per minute (BPM)⁽¹⁰⁾. In this study, the stratification of the variables was performed by subtracting the highest frequency (91 bpm) with the lowest (62 bpm), generating the prime number that allowed three bands of related intervals.

Breathing was the next indicator evaluated through incursions. Inspiration and expiration were counted as a respiratory movement. Normal breathing values are 12 to 20 respiratory incursions per minute (IPM)⁽¹⁰⁾. For wrist and breathing, a Champion® hand clock was used. At the end of a minute, these signals were recorded.

Heart rate was verified through a Premium stethoscope®, being carefully auscultated, at the maximum impulse point, the heart rate and the existence of heart problems for one minute⁽¹⁰⁾. To assess blood pressure, the Premium® sphygmomanometer analog device was used, following the technique according to the recommendations on the procedure⁽¹⁰⁾. In pregnant women, SBP≥140mmHg and/or DBP≥90mmHg values are considered consistent with hypertensive syndromes⁽¹¹⁾. Fetal heart rate was evaluated by Digital Sonar Baby Doppler International®, for one minute, from the 12th week of gestation. Fetal heart rate is ideal between 110-160 beats per minute⁽¹²⁾.

In the third stage, the first semi-structured interview was conducted about pregnancy and its repercussions on women's lives, to identify negative perceptions that can generate anxiety during this period. For this step, a voice recorder was used by smartphone application. The telephone line was temporarily disabled

at the time of recording, so that there were no interruptions during the interview process. The seized statements were transcribed to make up the database.

The fourth stage consisted of the intervention through music therapy. The songs were played in a Philips® headphone, wireless, with Bluetooth, and with memory card slot, sanitized at every use, with self-regulating volume. The intervention playlist was based on classical music, due to its soundness, low amplitude and simplicity in rhythm, played sequentially until reaching the estimated time of 30 minutes, according to similar research⁽¹³⁾, using Sprin Waltz, Nocturne, Four Seasons, Hallelujah – Instrumental (Piano/Violin/Cello Cover), Moonlight Sonata, Waltz of the Flowers. The pregnant woman was sitting on a comfortable reclining sofa, with her legs supported.

The fifth step was the reapplication of the previous steps immediately after the end of the playlist. The measurement of vital signs and cardiotetal beats were performed before and after music therapy, following the same aforementioned pattern. The evaluations of vital indicators were performed in the same limb before and after the intervention. The STAI-S was delivered for further self-completion. After that, there was another interview, using a semi-structured guide about the feeling of the effect of the music on the mother and how she felt the fetus.

It is noteworthy that for cardiotetal beats there was auscultation in the same quadrant of the intervention. This is the only vital indicator that can be evaluated noninvasively in the fetus and was included to assess the impact of music on the child, based on the effect reflected on the mother, considering that only she listened to the playlist.

The data were analyzed with the Statistical Package for the Social Sciences (SPSS), version 21. For the study variables, the Shapiro-Wilk test (sample < 50) was used, which indicates the normality of the data for the hypothesis tested: music therapy causes changes in the parameters object of the study. The means were compared

using the paired t-test due to the nature of the study, with $p \leq 0.05$ for statistical significance.

The transcription of the statements was submitted to thematic content analysis⁽¹⁴⁾, which, after the stages of pre-analysis, exploration of the material and treatment of the results, derived in two thematic categories, analyzed in the light of the theoretical analytical framework, proposed by Donabedian, and occurs in three stages (structure, process and result); for this study, only the third stage was considered, which concerns the result⁽¹⁵⁾. Thus, the focus was to verify the effect of music therapy on the gestational period based on the sensations perceived by the pregnant women after the intervention.

To preserve the anonymity of the pregnant women, they were coded with the letter P (Pregnant Woman) and numbered sequentially according to the care. The study followed all ethical procedures of research involving human beings of the institution studied, under Opinion n. 2.712.697/2018 and Certificate of Presentation of Ethical Appreciation (CAAE): 91072418.1.0000.5179. It is noteworthy that the study followed the recommendations of the guides related to Consolidated criteria for reporting qualitative research (COREQ) (qualitative approach) and Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) (quantitative approach), conferring greater methodological robustness.

Results

Most pregnant women were born in the capital (63.0%), with a mean age of 26.33 years ($SD \pm 5.46$) and age group between 24 and 29 (37.0%), with partner (77.0%), evangelical (57.0%), self-declared brown ethnicity (67.0%), with monthly income of up to one minimum wage (57.0%), primiparous (60.0%) and living strictly with the partner (67.0%).

Regarding the pulse, the value closest to the maximum threshold (100 beats per minute) had 46.0% prevalence in the pre-intervention; however, the measurements subsequently

measured indicated a 13% drop in this peripheral frequency assessment. Regarding breathing, 63.0% of the pregnant women had values below 15 respiratory incursions per minute. The intervention provided a 20.0% increase in prevalence in this same indicator, reaching 83% of the participants, suggesting possible relaxation, because they were eupneic.

The highest pre-intervention systolic blood pressure value was 130 mmHg in 13.0% of the participants. After music therapy, this indicator decreased to 7.0%. In diastolic blood pressure, 7.0% presented a value of 90 mmHg. After the intervention, this indicator was absent, with music contributing to a reduction in the prevalence of blood pressure (Table 1).

Table 1 – Monitoring of the vital signs of pregnant women before and after music therapy. João Pessoa, Paraíba, Brazil, 2018. (N=30)

Variable	n (%)	
	Before	After
Systolic Arterial Pressure (mmHg)		
90	1 (3)	1 (3)
100	6 (20)	6 (20)
110	5 (17)	6 (20)
120	14 (47)	15 (50)
130	4 (13)	2 (7)
Diastolic arterial pressure (mmHg)		
50	1 (3)	-
60	5 (17)	6 (20)
70	10 (33)	11 (37)
80	12 (40)	13 (43)
90	2 (7)	-
Pulse frequency (beats per minutes)		
62-70	5 (17)	8 (27)
71-80	11 (37)	12 (40)
81-91	14 (46)	10 (33)
Breathing (breaths per minute)		
12-15	19 (63)	25 (83)
16-20	11 (37)	5 (17)
Heart rate (beats per minutes)		
<60	1 (3)	1 (3)
60-100	26 (87)	29 (97)
>100	3 (10)	-
Oxygen saturation (%)		
Até 97	9 (30)	1 (3)
98-100	21 (70)	29 (97)
Cardiofetal beats (beats per minute)		
110-160	29 (97)	30 (100)
>160	1 (3)	-

Source: Created by the authors.

Note: Conventional signal used:

- Numerical data equal to zero not resulting from rounding.

The results were successful, because the means of systolic, diastolic, pulse, breathing, maternal and fetal heart rate were reduced, while oxygen saturation increased after intervention with music therapy. In this study, although there was a reduction in means, systolic and diastolic blood pressure statistically, as well as

cardiofetal beats were not influenced by the intervention. There was a significant difference between the mean pulse frequency ($p < 0.000$), breathing ($p = 0.002$), heart rate ($p < 0.000$) and oxygen saturation ($p = 0.002$) evidencing the effectiveness of music in improving these vital indicators (Table 2).

Table 2 – Means of the vital signs before and after music therapy. João Pessoa, Paraíba, Brazil, 2018. (N=30)

Variables	Mean ± SD*		MDif ± SD†	t test (df)‡	p-value§	Low/Upp
	Before	After				
Systolic Arterial Pressure	114.67±10.74	113.67±9.99	1.000±3.05	1.795 (29)	0.083	-0.139/2.139
Diastolic Arterial Pressure	73.00±9.52	72.33±7.73	0.667±7.39	0.494 (29)	0.625	-2.095/3429
Pulse	79.40±8.62	76.37±8.57	3.033±3.54	4.683 (29)	<0.000	1.709/4.358
Breathing	14.17±2.26	13.27±1.63	0.900±1.47	3.352 (29)	0.002	0.351/1.449
Maternal heart rate	84.87±12.29	81.20±10.09	3.667±5.02	3.996 (29)	<0.000	1.790/5.544
Oxygen saturation	97.77±0.971	98.33±0.547	-0.567±0.93	-3.319 (29)	0.002	-0.916/0.217
Cardiofetal beats	139.73±10.76	138.90±8.89	0.833±4.10	1.112 (29)	0.275	-0.699/2.365

Source: Created by the authors.

*SD: Standard deviation; † Mean and standard deviation of the differences observed before and after the intervention; ‡ t test and degree of freedom for paired measurements; § Paired t-test; || Low: lower / Upp: upper (95% confidence level).

Also on the descriptive results not exposed in the table, at the time of the pre-intervention, 3% had a low degree of anxiety, 87.0% moderate and 10% high. The outcome after music therapy was that low-grade women remained at the same level, and 97.0% of the pregnant women went from high-grade to moderate stratification.

The percentage of positive feelings increased after the intervention, such as: calm, security,

feeling of being at ease, rested, feeling “at home”, confidence, relaxedness, satisfaction, joy and feeling good. There was a percentage reduction in negative feelings after the intervention among pregnant women, namely: tension, regret, disturbance, concern about possible problems, anxiety, nervousness, agitation, feeling extremely nervous, worry and agitation (Table 3).

Table 3 – Feelings before and after music therapy according to the items of the scale *State-Trait Anxiety Inventory*. João Pessoa, Paraíba, Brazil, 2018. (N=30) (continued)

Scale items	Before				After			
	AN*	AL†	E‡	§M	AN*	AL†	E‡	§M
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Calm	4 (13)	12 (40)	13 (43)	1 (4)	4 (13)	-	19 (63)	7 (24)
Security	6 (20)	14 (46)	9 (30)	1 (4)	-	12 (40)	15 (50)	3 (10)
Tension	11 (37)	13 (43)	5 (16)	1 (4)	19 (63)	10 (33)	1 (4)	-
Regret	21 (70)	6 (20)	2 (6)	1 (4)	25 (84)	3 (10)	2 (6)	-
At ease	2 (6)	18 (60)	8 (27)	2 (7)	-	3 (10)	20 (67)	7 (23)
Disturbed	12 (40)	12 (40)	5 (16)	1 (4)	21 (70)	8 (26)	1 (4)	-
Concerned	4 (13)	18 (60)	7 (23)	1 (4)	5 (17)	23 (77)	2 (6)	-
Rested	16 (53)	11 (37)	3 (10)	-	1 (4)	7 (23)	18 (60)	4 (13)
Anxious	1 (4)	8 (27)	10 (33)	11 (36)	6 (20)	14 (47)	9 (30)	1 (3)
Feeling “at home”	8 (27)	11 (37)	9 (30)	2 (6)	1 (4)	10 (33)	13 (43)	6 (20)
Confident	2 (6)	15 (50)	7 (24)	6 (20)	-	6 (20)	16 (53)	8 (27)

Table 3 – Feelings before and after music therapy according to the items of the scale *State-Trait Anxiety Inventory*. João Pessoa, Paraíba, Brazil, 2018. (N=30) (conclusion)

Scale items	Before				After			
	AN*	AL†	E‡	§M	AN*	AL†	E‡	§M
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Nervous	3 (10)	12 (40)	10 (33)	5 (17)	16 (53)	13 (43)	1 (4)	-
Agitated	10 (33)	11 (37)	5 (17)	4 (13)	22 (73)	8 (27)	-	-
Extremely nervous	9 (30)	14 (47)	5 (17)	2 (6)	21 (70)	8 (27)	-	1 (3)
Relaxed	9 (30)	14 (47)	6 (20)	1 (3)	-	5 (17)	21 (70)	4 (13)
Satisfied	2 (6)	11 (37)	11 (37)	6 (20)	-	3 (10)	18 (60)	9 (30)
Concerned	5 (17)	21 (70)	3 (10)	1 (3)	9 (30)	2 (70)	-	-
Agitated and confused	9 (30)	15 (50)	5 (17)	1 (3)	25 (83)	3 (10)	2 (7)	-
happy	4 (13)	7 (24)	13 (43)	6 (20)	-	1 (3)	12 (40)	17 (57)
Well	2 (7)	13 (43)	7 (23)	8 (27)	-	1 (3)	11 (37)	18 (60)

Source: Created by the authors.

Note: Conventional signal used:

- Numerical data equal to zero, not resulting from rounding.

* AN = Absolutely not. † AL = A little. ‡ E = Enough. §M = Too much.

The qualitative approach was necessary to understand the statements before anxiety in the gestational period, before and after the musical intervention, allowing the construction of categories generated based on the questions: Was your pregnancy planned? How was your reaction when finding out? What feeling represents what you are feeling today? What is the sensation generated by the music? How did you notice your baby while you were listening to music?

The discovery of pregnancy and the gestational process as possible generators of negative sensations

Although the discovery brings differentiated sentimental reactions, the revelation of this new condition generated a sense of astonishment, in addition to fear, anxiety and emotional oscillation towards pregnancy:

When I found out, I was in shock. (P1).

At first, I was scared, but then we feel happy. (P17).

I got scared... thinking something was going to happen. (P3).

Six months trying, I was so anxious, it felt like it had been for year. (P2).

The worst thing is anxiety. (P10).

The women's statements perceived the fear and insecurity about the uncontrollable and unpredictable future, which can generate a state of anxiety. The news of pregnancy has an impact, because the feelings inherent to pregnancy are not only associated with the baby:

The responsibility, the waiting and not knowing if I am going to handle it. (P3).

I was worried. (P6).

Today I feel more peaceful and stable, but still afraid of the future. (P18).

Sometimes I wonder if I can handle it or not, if I am going to know how to raise the child. (P29).

It is noteworthy that the planning of the appropriate time and the right partner to become pregnant have repercussions on the emotional state of pregnant women, emphasizing the importance of the support network to reduce the risk of negative feelings that generate anxiety:

I have heard negative words from people I love. (P2).

At first I was desperate and sad. I feel a little lonely, that is what makes me sad, I do not have the proper support and foundation I would like and need. (P18).

It makes me sad what others talk to me, the way they talk. (P25).

Sometimes we hear a so many bad things from others, which ends up letting us down. (P28).

Music therapy as a generator of positive sensations in the mother and reactive in the fetus.

After the music therapy section, the women were asked about the sensations generated in the post-intervention. According to the statements, listening to music generates a feeling of peace, strength, lightness, tranquility and connection of the mind and body, listening and singing music are behaviors that provide good emotional expressiveness:

Tranquility, peace and quiet. (P1, P3, P28).

Relief. (P2).

Emotion. (P4, P22).

Peace. (P4, P26-P27, P29-P30).

Peaceful. (P17).

Happiness. (P19).

Gratitude and peace. (P5).

Happy. (P8, P9).

Calm. (P1, P6, P8-P9, P11-P12, P14, P17, P21-P22, P26-P27, P29-P30).

Inner cure. (P16).

I feel happy. (P28).

I feel my soul in peace. (P16).

I feel like a bad no problems. (P1, P6, P17, P21-P22).

I feel calm. (P2-P3, P5, P10, P12, P17, P20, P23, P25-P30).

I feel like a fortress. (P5).

Happy. (P7-P8, P14, P18, P22-P23, P25).

Tranquil and far from the world's problem. (P24).

I forget the problems. (P28).

I feel happier, calm and happy, I start to sing too. (P30).

I feel well. (P1, P6, P10, P18-P20, P22).

Although only the pregnant woman had heard the playlist through the headphones, the music provoked different reactions of fetal mobility, according to the statements:

He kept calm. (P4, P8-P10, P12-P13, P25, P27, P30).

He was calm. (P7, P11, P22-P23).

He was calm, just like us, if I get agitated, so does he, he feels everything. (P5).

He got calm, mas he got more agitated when it played Beethoven. (P3).

He moving a little. (P1).

He moved a lot (P2, P6, P16-P17, P21, P24, P26, P28-P29).

Discussion

According to the results, the means of vital parameters were improved after musical intervention, leading to a feeling of relaxation. Nursing practice can incorporate the use of multidisciplinary instruments to identify anxiety levels considering the causal nature of the gestational process, in addition to complementary strategies, such as music therapy, to provide care in reducing clinical risks resulting from changes in vital signs. Music is an effective, non-pharmacological and low-cost technology, which makes the study relevant for women and the multidisciplinary team.

Studies have shown the effect of music therapy contributing to the maintenance of satisfactory values of heart rate^(7,16), breathing^(4,7), blood pressure^(4,7,16) and pulse^(4,16), which reinforces the data of this study. The improvement of all percentages with satisfactory response scale in the STAI-S items demonstrates the influence of sound on the perception of stimulus to calm, security, rest, confidence, joy and well-being, as well as on the reduction of tension, concern, disturbance, anxiety and nervousness, corroborating national and international research on the effectiveness of the musical strategy in reducing anxiety^(4-5,7,16).

Regarding speech, insecurity and anxiety may be related to emotional support during pregnancy^(2,17-19). In addition, hesitation, instability, responsibility and care directed to the new being can be sensations inherent to pregnancy. Therefore, negative feelings can lead to exacerbated emotional reactions and unfavorable perinatal outcomes⁽²⁰⁻²¹⁾, which can cause psychological distress⁽²²⁾. The treatment of complementary therapies is an alternative to prevent mental illness in pregnant women⁽²³⁾, whose music therapy provides disconnection and reflection, improving biopsychosocial well-being^(22,24).

Although in this study classical music was the style selected to maintain the rigor of the intervention, the reduction of anxiety depends on the melody chosen by the individual who connects with the rhythm that most pleases him/her⁽¹³⁾, favoring spiritualization and constituting a useful tool for the self-healing of afflictions and longings in the gestational period.

On the effect of music on the fetus, although there was no statistical significance in the pre- and post-test, the mean cardiofetal beats decreased, in addition to no fetus with post-intervention tachycardia. The statements showed the reflection of music therapy in the mobility of the child and in the mother's connection with the baby, which may favor the construction of the affective bond. Nevertheless, songs heard during pregnancy can impact the baby after birth, improving ambience, sleep and reduced crying frequency⁽²⁵⁾.

Based on the theoretical framework adopted to evaluate the result, the quality of care can be indicated by the risks, benefits, costs and access to the service provided. More precisely, quality is measured by the effect caused in individuals⁽¹⁵⁾. Articulating the concepts with the findings of this study, music therapy is an effective therapeutic resource to be used in the gestational period, being evidenced that it contributed positively to the improvement of the clinical aspects and mental health of pregnant women, and can reverberate in fetal health, as indicated by the literature. After the intervention, the benefit of therapy was verified, and strategies should be rethought for the implementation of this practice in prenatal care, since using technical resources available in health care minimizes the risks, leading to favorable changes in the process of individual and collective care.

The non-use of electronic devices to compare the accuracy of measurements and the use of a musical style with several rhythms were limitations of this study. Controlled protocols should be used to the reliable identification of measurements and musical notes working on the variables.

Conclusion

Pregnancy is a possible condition that generates negative sensations that can influence the emotional state. Music therapy promoted positive effects, favored the reduction of the degree of anxiety, had repercussions on the child's mobility and had a significant effect on the improvement of pulse, breathing, heart rate and oxygen saturation, without affecting cardiofetal beats and systolic and diastolic arterial pressures.

Collaborations:

1 – conception, design, analysis and interpretation of data: Ana Carolina Almeida Pereira and Smalyanna Sgren da Costa Andrade;

2 – writing of the article and relevant critical review of the intellectual content: Ana Carolina Almeida Pereira, Viviane Cordeiro de Queiroz and Smalyanna Sgren da Costa Andrade;

3 – final approval of the version to be published: Ana Carolina Almeida Pereira, Viviane Cordeiro de Queiroz, Smalyanna Sgren da Costa Andrade, Ana Carolina Dantas Rocha Cerqueira, Vagna Cristina Leite da Silva Pereira and Simone Helena dos Santos Oliveira.

References

1. Silveira RAM, Grossi-Milani R, Velho APM, Marques AG. Perception of pregnant women about self-care and maternal care. *Rev Rene*. 2016;17(6):758-65. DOI: 10.15253/2175-6783.2016000600005
2. Silva MMJ, Nogueira DA, Clapis MJ, Leite EPRC. Anxiety in pregnancy: prevalence and associated factors. *Rev esc enferm USP*. 2017;51:e03253. DOI: 10.1590/S1980-220X 2016048003253
3. Morais AODS, Simões VMF, Rodrigues LDS, Batista RFL, Lamy ZC, Carvalho CA, et al. Maternal depressive symptoms and anxiety and interference in the mother/child relationship based on a prenatal cohort: an approach with structural equations modeling. *Cad Saúde Pública*. 2017;33(6):e00032016. DOI: 10.1590/0102-311X00032016

4. Melo GAA, Rodrigues AB, Firmeza MA, Grangeiro ASM, Oliveira PP, Caetano JÁ. Musical intervention on anxiety and vital parameters of chronic renal patients: a randomized clinical trial. *Rev Latino-Am Enfermagem*. 2018;26:e2978. DOI: 10.1590/1518-8345.2123.2978
5. Lin CJ, Chang YC, Chang YH, Hsiao YH, Lin HH, Liu SJ, et al. Music interventions for anxiety in pregnant women: a systematic review and meta-analysis of randomized controlled trials. *J Clin Med*. 2019;8(11):1884. DOI: 10.3390/jcm8111884
6. Garcia-Gonzalez J, Ventura-Miranda MI, Requena-Mullor M, Parron-Carreño T, Alarcon-Rodriguez R. State-trait anxiety levels during pregnancy and foetal parameters following intervention with music therapy. *J Affect Disord*. 2018;232:17-22. DOI: 10.1016/j.jad.2018.02.008
7. González JG, Miranda MIV, Garcia FM, Ruiz TIP, Gascón MLM, Mullor MR, et al. Effects of Prenatal Music Stimulation on Fetal Cardiac State, Newborn Anthropometric Measurements and Vital Signs of Pregnant Women: A Randomized Controlled Trial. *Complement Ther Clin Pract*. 2017;27:61-7. DOI: 10.1016/j.ctcp.2017.03.004
8. Triola MF. *Introdução à Estatística - Atualização da Tecnologia*. 11a ed. Rio de Janeiro: LTC; 2013.
9. Biaggio A, Natalício L. *Manual para o Inventário de Ansiedade Traço-Estado (IDATE)*. Rio de Janeiro: CEPA; 1979.
10. Jensen S. *Semiologia para Enfermagem – Conceitos e Prática Clínica*. Rio de Janeiro: Guanabara Koogan; 2013.
11. Sociedade Brasileira de Pneumologia e Tisiologia. *Oximetria de Pulso* [Internet]. Brasília (DF); 2018 [cited 2020 Jan 12]. Available from: <https://sbpt.org.br/portal/espaco-saude-respiratoria-oximetria-de-pulso/>
12. Brasil. Ministério da Saúde. Instituto Sírio-Libanês de Ensino e Pesquisa. *Protocolos da Atenção Básica: Saúde das Mulheres* [Internet]. Brasília (DF); 2016 [cited 2020 Jan 22]. Available from: http://bvsm.sau.gov.br/bvs/publicacoes/protocolos_atencao_basica_saude_mulheres.pdf
13. Zhou K, Li X, Li J, Liu M, Dang S, Wang D, et al. A clinical randomized controlled trial of music therapy and progressive muscle relaxation training in female breast cancer patients after radical mastectomy: results on depression, anxiety and length of hospital stay. *Eur J Oncol Nurs*. 2015;19(1):54-9. DOI: 10.1016/j.ejon.2014.07.010
14. Taquette SR, Minayo MC. An analysis of articles on qualitative studies conducted by doctor published in scientific journals in Brazil between 2004 and 2013. *Physis*. 2017;26(2):417-34. DOI: 10.1590/s0103-73312017000200010
15. Donabedian A. *Explorations in Quality Assessment and Monitoring*. Michigan (US): Health Administration Press; 1980.
16. Betegon AA, García M, Parés S, Montenegro G, Feixas G, Padilla N, et al. A Program Aimed at Reducing Anxiety in Pregnant Women Diagnosed With a Small-for-Gestational-Age Fetus: Evaluative Findings From a Spanish Study. *J Perinatal Neonatal Nurs*. 2017;31(3):225-35. DOI: 10.1097/JPN.0000000000000270
17. Rees S, Channon S, Waters CS. The impact of maternal prenatal and postnatal anxiety on children's emotional problems: a systematic review. *Eur Child Adolesc Psychiatry*. 2019;28(2):257-80. DOI: 10.1007/s00787-018-1173-5
18. Sujan AC, Rickert ME, Oberg AS, Quinn PD, Hernández-Díaz S, Almqvist C, et al. Associations of Maternal Antidepressant Use During the First Trimester of Pregnancy With Preterm Birth, Small for Gestational Age, Autism Spectrum Disorder, and Attention-Deficit/Hyperactivity Disorder in Offspring. *Jama*. 2017;317(15):1553-62. DOI: 10.1001/jama.2017.3413
19. Freeman MP, Góez-Mogollón L, Mcinerney KA, Davies AC, Church TR, Sosinsky AZ, et al. Obstetrical and neonatal outcomes after benzodiazepine exposure during pregnancy: Results from a prospective registry of women with psychiatric disorders. *Gen Hosp Psychiatry*. 2018;53:73-9. DOI: 10.1016/j.genhosppsych.2018.05.010
20. Corbijn van Willenswaard K, Lynn F, McNeill J, McQueen K, Dennis CL, Lobel M, et al. Music interventions to reduce stress and anxiety in pregnancy: a systematic review and meta-analysis. *BMC Psychiatry*. 2017;17(1):271. DOI: 10.1186/s12888-017-1432-x
21. Lima MOP, Tsunehiro MA, Bonadio IC, Murata M. Depressive symptoms in pregnancy and associated factors: longitudinal study. *Acta paul enferm*. 2017;30(1):39-46. DOI: 10.1590/1982-0194201700007
22. Fancourt D, Perkins R. Could listening to music during pregnancy be protective against postnatal depression and poor wellbeing

- post birth? Longitudinal associations from a preliminary prospective cohort study. *BMJ Open*. 2018;8(7):e021251. DOI: 10.1136/bmjopen-2017-021251
23. Van Ravesteyn LM, Lambregtse - van den Berg MP, Hoogendijk WJG, Kamperman AM. Interventions to treat mental disorders during pregnancy: a systematic review and multiple treatment meta-analysis. *PLoS One*. 2017;12(3):e0173397. DOI: 10.1371/journal.pone.0173397
24. Hepp P, Hagenbeck C, Gilles J, Wolf OT, Goertz W, Janni W, et al. Effects of music intervention during caesarean delivery on anxiety and stress of the mother a controlled, randomised study. *BMC Pregnancy Childbirth*. 2018;18(1):435. DOI: 10.1186/s12884-018-2069-6
25. van der Heijden MJE, Oliari Araghi S, Jeekel J, Reiss IKM, Hunink MGM, van Dijk M. Do Hospitalized Premature Infants Benefit from music Interventions? A Systematic Review of Randomized Controlled Trials. *PloS One*. 2016;11(9):e0161848. DOI: 10.1371/journal.pone.0161848

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