

Music therapy in relief of pain in oncology patients

A música no alívio da dor em pacientes oncológicos

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ABSTRACT

Objective: To evaluate the perception of oncology patients with chronic pain as to the effects of music in alleviating pain, to identify if there are changes in the vital signs of these patients before and after the musicotherapy session, and to identify whether the intensity of pain is diminished after the music session as per an analogic scale of pain. **Methods:** This level II, descriptive-exploratory and cross-sectional study used a quantitative and qualitative approach. The sample consisted of ten oncology patients with chronic pain. **Results:** There was a reduction in vital signs and in intensity of pain in ten patients of the sample; after the music sessions, the patients reported a sensation of relief of pain, relaxation, and a belief in the power of music as a supplementary therapy. **Conclusions:** Music showed an influence in reducing vital signs and pain intensity, and the patients perceived a reduction of pain and anxiety, and began to believe in music as a form of therapy.

Keywords: Music; Pain/therapy; Neoplasms; Music therapy

RESUMO

Objetivo: Avaliar a percepção de pacientes oncológicos com dor crônica sobre os efeitos da música no alívio da dor, identificar se ocorrem alterações nos sinais vitais nesses pacientes antes e após a sessão de musicoterapia e identificar se a intensidade da dor é reduzida após a sessão de música, de acordo com a escala analógica de dor. **Métodos:** Esse estudo descritivo-exploratório, transversal e de nível II utilizou os recursos da abordagem quantitativa e qualitativa. A amostra foi composta por dez pacientes oncológicos com dor crônica. **Resultados:** Houve redução nos sinais vitais e na intensidade da dor nos dez pacientes da amostra; os pacientes relataram sensação de alívio da dor, relaxamento e crença na potência da música como terapia complementar após as sessões de música. **Conclusões:** A música influenciou na redução dos sinais vitais, da intensidade da dor e os pacientes perceberam redução da dor, da ansiedade e começaram a acreditar na música como forma de terapia.

Descritores: Música; Dor/terapia; Neoplasias; Musicoterapia

INTRODUCTION

Oncological pain may occur due to the primary tumor or its metastases. Patient suffering is a result of experiencing pain associated with physical incapacity, isolation from family and society, financial concerns, changes in appearance, and fear of death⁽¹⁾.

Pain is considered one of the most common and feared symptoms in oncology patients. It is estimated that 10 to 15% of cancer patients experience pain of significant intensity in cases of initial disease. With the appearance of metastases, the incidence of pain increases 25 to 30%, and in very advanced phases of the disease, 60 to 90% of patients report pain of significant intensity. Approximately nine million people worldwide suffer from oncological pain, and half of the patients feel pain during all stages of cancer, whereas 70% feel it only in advanced disease⁽¹⁾.

According to the International Association for the Study of Pain, pain may be defined as “an unpleasant sensory and emotional experience associated with tissue damage.” Besides being induced by nocive stimuli, it is also associated with individual characteristics, such as mood⁽¹⁻²⁾.

Chronic pain has a sudden onset, of mild to intense intensity, is constant or recurrent, with no expected or predictable termination, and lasts for more than six months⁽³⁾.

Nurses should be able to recognize and identify “signs of pain”. This is a task that may generate difficulties, since patients and professionals may have different concepts of what pain is⁽¹⁾.

According to literature, various types of therapy are used to manage chronic pain. Among them are musicotherapy, massages, applications of heat, and distraction techniques⁽¹⁾.

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Received on Feb 20, 2008 – Accepted on Mar 15, 2009

Music has always been a constant presence in the life of mankind, and for this reason, it is as ancient as humanity. The first reports of the use of music in combating diseases were found in Egyptian medical papyri, thousands of years before Christ, and they attributed an influence on a woman's fertility to the enchantment of music⁽⁴⁾. Musicotherapy is a field of medicine that studies the human being-sound complex, with the objective of opening channels of communication in individuals in order to produce therapeutic, psychoprophylactic, and rehabilitation effects in man and society⁽⁵⁾.

Sensory cells with cilia at the apex are inlaid in the auditory membrane. When these cilia bend during membrane dislocation, a chemical substance is released being captured by a nervous fiber that conducts this nervous impulse to the brain⁽⁶⁾.

When the sound reaches the brain, it will act on the limbic system, specifically the amygdaloid complex. In a situation of stress, fear, or sadness, this complex sends a message to the hypothalamus that orders the hypophysis to release the adrenocorticotrophic hormone. This hormone circulates in the blood stream until it reaches the suprarenal glands, which in turn release cortisol⁽⁷⁾.

The physiological effects of music involve sensory, hormone, and physical-motor reactions, such as changes in the metabolism, release of adrenaline, regulation of the breathing rate, changes in arterial blood pressure, reduction of fatigue and muscle tone, and an increase in the threshold of sensory stimuli, improving attention and concentration⁽⁶⁾.

Music in nursing practice has been named as a supplementary therapeutic resource in the management and control of acute and chronic pain. In 1977, the first Musicotherapy Program was initiated at a unit of palliative care of the Royal Victoria Hospital, Quebec, Canada⁽⁸⁻⁹⁾.

OBJECTIVE

The present study has the following objectives: to evaluate the perception of oncology patients with chronic pain as to the effects of music in relieving pain; to determine if there are changes in vital signs before and after the musicotherapy session; and to determine if the intensity of pain was reduced after the music session, according to an analogical scale of pain.

METHODS

This study was carried out in the oncology unit of a large private hospital in the state of São Paulo. The study population comprised ten cancer patients aged over 20 years, who experienced chronic pain, were

oriented in terms of time and space, were able to respond verbally to the study questions, and agreed to participate in the research study by signing the informed consent form.

The research project was initially submitted for appreciation to the Research Ethics Committee of the hospital where the data were collected. Interviews were conducted before and after the music sessions, and the guiding question was "How do you feel at this moment?". Before the interview with the patients, their clinical records had been consulted as to age, sex, pathology, frequency and intensity of pain, as well as the analgesic medications and coadjuvants prescribed for pain. Next, the vital sign parameters and the numerical pain evaluation scale were checked⁽¹⁰⁾. For each patient, a music session was applied on three different days. On the first day, Dvorak's "Serenade for Strings in C Major" was played; for the second session, the patients requested Johann Strauss' "Blue Danube", and on the third day, "Vivaldi's concertos" were used. Each music session lasted 20 to 30 minutes and occurred in the patient's room. Qualitative data were analyzed according to Bardin's content analysis. In this study, semantical categorization was utilized, i.e., grouping as per the theme⁽¹¹⁾.

For comparisons among the variables of pain, heart rate (HR) and respiratory rate (RR) before and after the music sessions, the Student's t-test was used. The value of the test was considered relevant if the difference was less than 0.05 (i.e., 5%).

RESULTS

Most of population comprised female patients (60%), aged between 60 and 80 years (60%) and who had bone metastases (30%).

The most frequently used class of analgesics was strong opioids (45%), followed by weak opioids (30%). Patients also used non-steroidal anti-inflammatory agents (15%) and adjuvant medications for pain (10%).

We can see in Chart 1 that there was a reduction in the levels of blood pressure (BP) in 90% of patients (patients 1, 2, 3, 4, 5, 6, 7, 8, and 9) after the music session.

Chart 2 shows that there was a reduction in HR in almost all patients, except for patient 1. On Chart 3 there was a reduction in RR in all patients.

It is observed on Chart 4 that in 100% of cases there was a reduction in pain scores after the music session. It is clear that the patients experienced moderate to intense pain before the music session (patients 1, 3, 4, 5, 6, 7, 8, 9, and 10), and obtained a reduction in intensity of pain after the sessions.

Chart 1. Distribution of oncology patient population with pain as per arterial blood pressure (BP) levels before and after the music sessions

Patients	BP before		BP after		BP before		BP after	
	1 st music session	1 st music session	2 nd music session	2 nd music session	3 rd music session	3 rd music session	3 rd music session	3 rd music session
1	110 x 70	100 x 70	110 x 70	110 x 70	120 x 90	120 x 80		
2	140 x 70	130 x 80	140 x 70	120 x 90	130 x 90	130 x 70		
3	130 x 90	130 x 90	130 x 90	120 x 80	130 x 90	120 x 80		
4	130 x 80	120 x 80	130 x 70	120 x 70	140 x 80	130 x 80		
5	140 x 70	120 x 70	100 x 90	110 x 90	110 x 80	100 x 80		
6	140 x 80	120 x 70	130 x 70	120 x 80	150 x 90	130 x 90		
7	170 x 90	150 x 80	150 x 10	140 x 80	150 x 10	130 x 80		
8	150 x 80	130 x 80	150 x 80	130 x 80	130 x 90	120 x 80		
9	130 x 80	120 x 80	140 x 90	130 x 80	130 x 80	120 x 80		
10	120 x 80	120 x 80	130 x 80	120 x 90	120 x 80	120 x 80		

Chart 2. Distribution of oncology patient population with pain as to heart rate (HR) before and after the music sessions

Patients	HR before		HR after		HR before		HR after	
	1 st music session	1 st music session	2 nd music session	2 nd music session	3 rd music session	3 rd music session	3 rd music session	3 rd music session
1	65	60	65	63	60	63		
2	75	65	80	73	77	70		
3	75	70	65	60	85	68		
4	79	70	80	75	87	80		
5	65	60	70	68	70	68		
6	75	68	75	68	80	70		
7	75	68	75	68	88	70		
8	80	75	90	75	80	72		
9	75	70	85	75	80	72		
10	96	82	82	75	75	68		

Chart 3. Distribution of oncology patient population with pain as to respiratory rate (RR) before and after the music sessions

Patients	RR before		RR after		RR before		RR after	
	1 st music session	1 st music session	2 nd music session	2 nd music session	3 rd music session	3 rd music session	3 rd music session	3 rd music session
1	27	17	22	15	16	16		
2	17	15	17	16	20	14		
3	18	15	17	17	23	18		
4	18	15	18	16	25	18		
5	20	14	15	12	14	13		
6	23	18	17	16	20	14		
7	25	19	17	16	28	18		
8	22	18	25	20	22	18		
9	18	15	22	18	19	15		
10	25	19	20	18	17	15		

Chart 4. Pain score of oncology patients as per the analogical pain scale

Patients	Pain score before		Pain score after		Pain score before		Pain score after	
	1 st music session	1 st music session	2 nd music session	2 nd music session	3 rd music session	3 rd music session	3 rd music session	3 rd music session
1	8	2	6	6	4	2		
2	3	0	1	0	2	0		
3	4	0	2	0	5	0		
4	4	1	3	0	7	3		
5	5	3	3	0	2	0		
6	7	3	5	0	8	2		
7	7	3	5	0	8	2		
8	4	1	6	0	5	0		
9	4	1	5	0	4	0		
10	8	2	5	1	4	0		

Paired Student’s t-test was conducted for two dependent samples (one before and another after the music sessions). The results are shown on tables 1, 2 and 3.

Table 1. Correlation between heart rate (HR) before and after the music sessions

Variable	n	Mean	Standard deviation	p value
HR* before first music session	10	76.00	8.64	2.73
HR* after first music session	10	68.80	6.56	2.08
Difference	10	7.200	3.011	0.000**
HR* before second music session	10	76.70	8.30	2.67
HR* after second music session	10	70.00	5.48	1.37
Difference	10	6.70	3.80	0.000***
HR* before third music session	10	76.70	8.30	2.67
HR* after third music session	10	70.00	5.48	1.37
Difference	10	6.70	3.80	0.001****

* HR = heart rate; ** t-test of mean difference = 0 (versus > 0): t value = 7.56, p value = 0.000; *** t-test of mean difference = 0 (versus > 0): t value = 5.57, p value = 0.000; **** t-test of mean difference = 0 (versus > 0): t value = 4.14, p value = 0.001.

Table 2. Correlation between respiratory rate (RR) before and after the music sessions

Variable	n	Mean	Standard deviation	p value
RR* before first music session	10	21.30	3.59	1.14
RR* after first music session	10	16.50	1.90	0.60
Difference	10	4.800	2.348	0.742**
RR* before second music session	10	19.000	3.127	0.989
RR* after second music session	10	16.400	2.119	0.670
Difference	10	2.600	2.171	0.686***
RR* before third music session	10	20.40	4.25	1.34
RR* after third music session	10	15.90	1.97	0.62
Difference	10	4.500	2.991	0.946****

* RR = respiratory rate; ** t-test of mean difference = 0 (versus > 0): t value = 6.47, p value = 0.000; *** t-test of mean difference = 0 (versus > 0): t value = 3.79, p value = 0.002; **** t-test of mean difference = 0 (versus > 0): t value = 4.76, p value = 0.001.

Table 3. Correlation between intensity of pain before and after the music sessions

Variable	n	Mean	Standard deviation	p (t-Student)
Intensity of pain before first music session	10	5.400	1.897	0.600
Intensity of pain after first music session	10	1.600	1.174	0.371
Difference	10	3.800	1.317	0.416*
Intensity of pain before second music session	10	4.100	1.729	0.547
Intensity of pain after second music session	10	0.700	1.889	0.597
Difference	10	3.400	1.955	0.618**
Intensity of pain before third music session	10	4.900	2.183	0.690
Intensity of pain after third music session	10	0.900	1.197	0.379
Difference	10	4.000	1.563	0.494***

* t-test of mean difference = 0 (versus > 0): t value = 9.13 p value = 0.000; ** t-test of mean difference = 0 (versus > 0): t value = 5.50, p value = 0.000; *** t-test of mean difference = 0 (versus > 0): t value = 8.09, p value = 0.000.

Table 1 shows that in all tests, the p value was less than 0.05 (or 5%), that is, there was a significant drop in the mean HR after the music session.

It is observed in table 2 that the p value was less than 0.05 (or 5%), which means that there was a significant drop in the mean RR after the music session.

Table 3 shows that in all tests the p value was less than 0.05 (or 5%), that is, there was a significant drop in intensity of pain after the music session.

Cores of meaning and quotes from the patients in responding to the guiding question “How do you feel at this moment?” are shown below.

Before the music sessions

- First core of meaning: expressing relief of pain, relaxation, feelings and memories after the sessions.

“Music has the same effect as morphine; it seems like it took the pain right out of me.” (Patient 3)

“As incredible as it may seem, I’m not feeling any more pain.” (Patient 9)

“I feel free and I don’t remember my pain anymore... does it exist?” (laughter) (Patient 8)

“I love waltzes; I remembered a trip I took to Vienna.” (Patient 2)

- Second core of meaning: discovering the power of music in treating pain. The patients reported believing in the effect of music after the music sessions.

“I didn’t want to receive the medication, because I believe I will get better after this music session.” (Patient 6)

“I think instead of morphine, I’m going to ask for a dose of classical music – what do you think?” (Patient 7)

DISCUSSION

One can perceive through the cores of meaning that there was a reduction in chronic pain. Before the first music session, the patients reported a feeling of incredulity in this form of non-drug therapy. It is known that patients with chronic pain are submitted to different pharmacological and non-pharmacological treatments, and often this type of pain is difficult to control. These patients may become “unbelievers” in alternative therapies since these are not well-known or frequently applied. Many healthcare professionals do not use this type of therapy, likely because they do not feel prepared to do so. On the other hand, a study carried out by Fonseca with the nursing team on the credulity and effects of music as a therapeutic modality in healthcare⁽¹²⁾, showed that these professionals believe in musicotherapy. This may be the first step

toward the application of this treatment in different areas.

A study conducted by Gonçalves evaluated the effect of music in patients with pain under palliative care and concluded that with the application of musicotherapy sessions, besides reduction in pain, some patients reported having slept better, felt more relaxed and tranquil, and others even evoked personal memories⁽¹³⁾.

The important issue in management of chronic pain involves not only the use of non-pharmacological therapies. The use of pharmacological therapy is vital, as the World Health Organization (WHO) recommends it. The Organization establishes guidelines for pain control – the analgesic ladder – indicating: for mild pain (step 1), non-opioids, such as aspirin; for moderate pain (step 2), it indicates weak opioids such as codeine, associated with non-opioids and adjuvant therapies; and for intense pain, it indicates strong opioids, such as morphine concomitant with non-opioids, weak opioids and/or adjuvant therapies⁽¹⁴⁾.

It is important to report that one of the patients did not believe in the effect of music during the first session, but agreed to continue since he felt relief of pain after the music session. After the last session, he reported feeling the beneficial effect of music and became a believer in this form of therapy.

Besides the reduction in pain, there was a reduction in the values of vital sign parameters, especially RR and HR. Another study that assessed the therapeutic effect of music in children during the post-operative phase of cardiac surgery⁽¹⁵⁾, identified that in hearing music, children demonstrated a significant reduction in HR, arterial BP, and RR.

One should consider, however, the limitations of the study, since the sample is small for a sociological study. Therefore, the conduction of other studies on the theme with larger samples is suggested.

CONCLUSION

After the music sessions, the patients reported having obtained relief of pain, besides relaxation, evocation of personal memories, and forgot their problems. Changes

were identified in vital sign parameters and intensity of pain before and after the music session, with a statistically significant difference as per Student's t-test.

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