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Original Article

Effect of Music Therapy on Pain and Quality of Life among Cancer Survivors

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Abstract

Background : Cancer is one of the ten leading cause of death in India. Cancer patients usually present with moderate to severe pain which results usually from the cancer itself or from their treatment .To counteract pain complementary therapies are used along with the medical treatment. The most common used in the clinical setting is Music therapy; which is found to have a positive effect on the physical and psychological response of the patients.

Objectives : To find the effectiveness of Music therapy on Pain and Quality of life among Cancer survivors.

Material and Method : A quasi experimental research design was adopted for the study. The data were collected using demographic proforma, Numerical Pain rating scale and McGill Quality of life Questionnaire. 50 subjects with moderate to severe pain were identified and were randomly allocated into experimental (25) and control group (25). Experimental groups (25) received Music therapy for 15-20 mins twice a day for a period of 5 days. The control group (25) received no intervention. Pain was assessed twice a day, before and after the intervention for 5 days and QoL was assessed on the 6th and 10th day for both the groups.

Results: Majority of the subjects19 (38%) were between the age groups of 41-50 years and most of them 29 (58%) were males. Among the females the most common cancer was breast 12 (24%) and among males it was lungs 10 (20%). Most of the subjects 23(46%) had stage –II cancer, and 28(56%) were on radiation therapy. With regard to treatment, majority 29(58%) were on treatment for a duration of 1-3 months. The study also revealed a significant difference in the level of pain after the music intervention ($p<0.05$) and a significant improvement in the Quality of life especially affecting the physical and psychological domain ($p<0.05$). No significant association was found between pain, QoL and selected demographic variables ($p<0.05$)

Conclusion : Music therapy was found to be an effective complementary therapy in reducing the level of pain and improving the QoL of the cancer survivors.

Introduction

Despite of recent advancement in securing remission and possible cure; cancer still remains the major health problem that creeps upon without any warning.[1] According to the International Agency for Research on Cancer (IARC), the estimate new cancer cases were 14.1 million, accounting for 8.2 million deaths worldwide in 2012, (2.9 million in economically developed countries, and 5.3 million in economically developing countries) [1] and 8.8 million death in 2015.[2]

In India, the number of cancer deaths is projected to increase because of population growth, industrialization, urbanization, lifestyle changes and increase in the life expectancy.[3] Cancer patients are often treated with combination of radiation therapy, chemotherapy, targeted therapy and surgery.[4] Other than these treatment measures, cancer patients also use other complementary therapies to reduce their physical symptoms and improv their quality of life.

Music therapy is the most commonly used complementary

therapy in the clinical settings. Music serves as a distracter and gives the patient a sense of control; music causes the body to release endorphins to counteract pain. These endorphins are the natural painkillers of the body affecting the emotions of the patients.[5] Music therapy does not actually affect the disease itself; it has a great impact on the patient's mood, and sometimes can make a difference in the way the patient copes with and feels about his/ her disease.

Material and Methods

Quasi experimental research design was adopted for the study. The study was conducted in a tertiary care hospital at Mangalore, after obtaining the ethical clearance and formal permission from the higher authorities. The population of the study were the cancer subjects between the age group of 30-70 years, irrespective of gender. 50 subjects with moderate to severe pain were selected through purposive sampling technique and were randomly allocated into experimental (25) and control group (25). The instruments used for data collection were:

- Tool-1: Demographic Proforma
- Tool-2: Numerical Pain Rating Scale.
- Tool-3: McGill Quality of Life Questionnaire (MQOL).

After obtaining content validity and reliability the tool was used to collect the data. Intraclass correlation coefficient was used to assess the reliability and it was found to be o.7 for the numerical pain rating scale and 0.94 for the McGill Quality of Life Questionnaire (MQOL). The cancer subjects who met the inclusion criteria were selected and informed consent was taken from them individually after explaining the objectives and purpose of the study. Confidentiality was assured to all the participants. Demographic Proforma, Numerical Pain rating scale and McGill Quality of life Questionnaires were administered to the two groups at the baseline level. Experimental groups (25) received Music therapy for 15-20 mins twice a day (morning and evening) for a period of 5 days. The control groups (25) received no intervention. Pain was assessed before and after the intervention for both the groups' for 5 days and QOL was assessed on the 6th and 10th day after the intervention.

The information collected was summarized by using descriptive statistics such as frequency, percentage, mean, standard deviation (SD), median and IQR (Inter Quartiles Range).

To find the effectiveness of Music Therapy on Pain, Friedman Test, Mann Whitney U Test and Wilcoxon sign rank test, were used. Repeated measures ANOVA, Multiple comparisons by Bonferroni correction were used to find the effectiveness of music therapy on Quality of life of cancer subjects. Chi-square test and Likelihood ratio were used to find out the baseline association between pain and Quality of life with selected demographic variables and Spearman's correlation coefficient were used to analyze the relationship between the pain and quality of life of cancer subjects. The p value <0.05 was considered significant. The collected data was analysed by using SPSS package version 16.0.

Table 1 : Distribution of demographic characteristics of the subjects n=50

Characteristics	Experimental (n = 25)		Control (n = 25)	
	f	%	f	%
Age				
31-40	6	24	2	8
41-50	8	32	11	44
51-60	6	24	8	32
61-70	5	20	4	16
Gender				
Male	13	52	16	64
Female	12	48	9	36
Marital status				
Married	25	100	25	100
Education				
Primary	15	60	16	64
Secondary	7	28	7	28
PUC	1	4	2	8
Degree and above	2	8	-	-
Occupational Status				
Business	8	32	4	16
Govt. Job	1	4	1	4
Unemployed	1	4	-	-
Coolie	4	16	6	24
Agriculture	2	8	5	20
Homemaker	9	36	9	36
Monthly Income				
<5000	14	56	14	56
5001-10000	9	36	7	28
10001-15000	2	8	4	16

Results

The study population consisted of 29 (58%) males and 21 (42%) females with the mean age of 52.3 ± 8.87. Majority of the subjects 31(62%) had a primary education. With regard to the occupation, 18 (36%) of the subjects were homemaker and most of them 28 (56%) were having a monthly income of Rs < 5000. (Table-1)

Distribution of subjects based on clinical attributes

Out of 50 subjects, the most common cancer among females was breast 12(24%) and among males it was lungs 10(20%)(Fig-1). The sample characteristics also showed that majority 23(46%) of the subjects who were diagnosed with cancer were in stage –II (Fig-2).

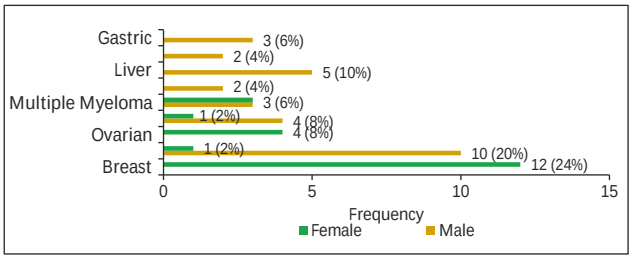

Fig. 1 : Vertical Multiple Bar diagram depicting Gender wise distribution of subjects based on Types of Cancer.

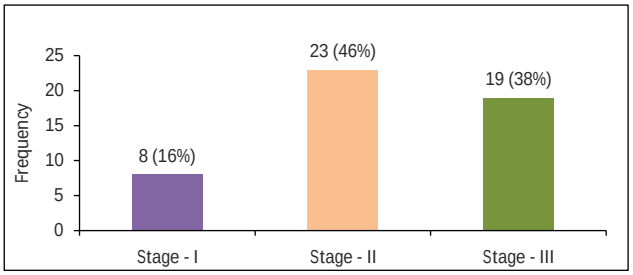

Fig. 2 : Simple Bar diagram depicting distribution of the subjects based on Stages of Cancer

Distribution of Level of pain and QOL of cancer survivors

At the baseline, majority of the subjects 17(34%) experienced moderate pain followed by severe pain 8(16%) in both the experimental and control groups respectively (Fig-3).

Median and Inter Quartile Range was used to find the level of pain among the experimental and control group in all the 5 consecutive days of the interventions and it was found that at the baseline (Day-1) the level of pain was high (Median= 6, IQR = 5-7) when compared to Day-2, Day-3, Day-4 and Day-5 (Median = 2, IQR = 1- 2). No much significant difference was seen in the control groups. Similarly, the level of QOL was improved in Day-6 (x_2= 6.53 ± 1.15) and Day-10 ($_3$= 7.07 ± 1.21) compared to that of Day-1 ($_1$ = 5.79 ± 1.45) in the experimental groups, with no much significant difference in the control groups. (Fig-4)

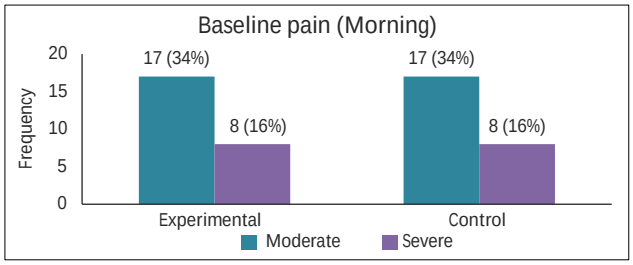

Fig.3 : Multiple bar diagram depicting frequency distribution of Baseline pain.

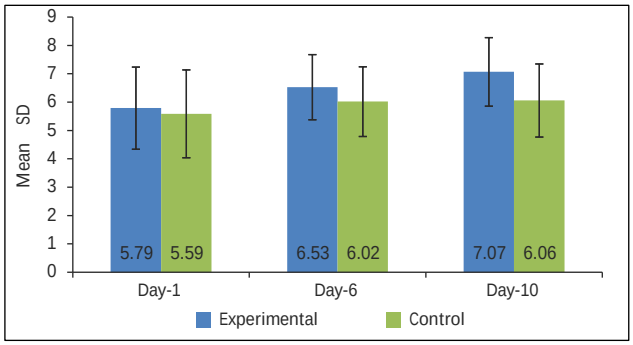

Fig. 4 : Error bar diagram depicting distribution of QoL between experimental and control groups

Effectiveness of Music therapy on pain

Friedman Test, Mann Whitney U Test and Wilcoxon Signed Rank Test were used to find the effectiveness of Music therapy on pain among the cancer subjects. The Friedman's Test showed that there is a significant difference in level of pain in all the 5 consecutive days in both the experimental and control group ($p < 0.001$). Mann-Whitney U test was used to compare the level of pain between experimental and control and the findings revealed that post-test p values between experimental and control groups is <0.05, which indicates that there is a difference in both groups(Table -2).Wilcoxon Signed Rank Test compared the difference between pre-test and post-test among the experimental and control groups and the findings of the study revealed that in the experimental groups the difference is seen more ($p<0.05$) compared to that of the control groups.(Table-3)

Table 2 : Comparison of pain between Experimental and Control group by using Mann-Whitney U test. n=50

	Morning				Evening			
	Pre		Post		Pre		Post	
	Z	p value	Z	p value	Z	p value	Z	p value
Day-1	-0.040	0.968	-4.34	<0.001*	-0.570	0.569	-4.800	<0.001*
Day-2	-0.220	0.826	-4.60	<0.001*	-2.72	0.007*	-5.599	<0.001*
Day-3	-2.13	0.033*	-5.92	<0.001*	-2.20	0.027*	-6.003	<0.001*
Day-4	-2.75	0.006*	-5.98	<0.001*	-3.46	0.001*	-5.81	<0.001*
Day-5	-3.07	0.002*	-6.045	<0.001*	-4.57	<0.001*	-6.10	<0.001*

Z value = -1.96, (* Indicates significance)

Table 3 : Comparison of pain between the groups by using Wilcoxon Signed rank test n=50

	Experimental (Pre and Post test)				Control (Pre and Post test)			
	Morning		Evening		Morning		Evening	
	Wilcoxon Signed Rank(Z)	p value	Wilcoxon Signed Rank(Z)	p value	Wilcoxon Signed Rank(Z)	p value	Wilcoxon Signed Rank(Z)	p value
Day-1	- 4.29	< 0.001*	- 4.33	< 0.001*	- 1.00	0.31	- 2	0.046*
Day-2	- 4.32	< 0.001*	- 4.39	< 0.001*	- 1.73	0.08	- 2.23	0.02*
Day-3	- 4.00	< 0.001*	- 4.14	< 0.001*	- 1.73	0.08	- 1	0.31
Day-4	- 4.26	< 0.001*	- 4.26	< 0.001*	0.001	1	- 2.44	0.01*
Day-5	- 4.07	< 0.001*	- 4.11	< 0.001*	- 1.73	0.08	- 1	0.31

(* Indicates significance)

Effectiveness of music therapy on quality of life

Repeated measures ANOVA and Bonferroni correction was used to find the effectiveness of music therapy on quality of life among the cancer subjects. The findings revealed that Music therapy was effective and had a major influence on the physical and psychological domain of the QoL ($p<0.05$) (Table 4 &5)

Table 4 : Comparison of QOL within and between the groups by using repeated measures ANOVA. n=50

QOL domain	Within the group		Between the group	
	F	p value	F	p value
Physical	29.04	<0.001*	6.48	0.01*
Psychological	16.21	<0.001*	4.76	0.01*
Existential	13.65	<0.001*	2.09	0.12

(* Indicates significance)

Table 5 : Pair wise comparison of QOL by using Bon ferroni correction between the Experimental and Control groups

QOL Domain	Days		Experimental (n=25)			Control (n=25)		
			Mean difference	p value	95% C.I	Mean difference	p value	95% C.I
Physical	Day-1	Day-6	- 1.77	<0.001*	- 2.68 to - 0.86	- 0.90	0.13	-2.0 to 0.19
		Day-10	- 2.54	<0.001*	- 3.52 to - 1.56	- 0.85	0.14	- 1.91 to 0.20
	Day-6	Day-10	- 0.77	<0.001*	- 1.16 to - 0.38	0.05	1.00	0.26 to 0.37
Psychological	Day-1	Day-6	- 0.89	0.006*	- 1.54 to - 0.23	- 0.50	0.28	- 1.24 to 0.24
		Day-10	- 1.47	<0.001*	- 2.14 to - 0.79	- 0.42	0.25	- 1.02 to 0.18
	Day-6	Day-10	- 0.58	0.070	- 1.19 to 0.03	0.08	1.00	- 0.33 to 0.49

(* Indicates significance)

Association between baseline pain and QOL with selected demographic variables: The findings of the study revealed no significant association between baseline pain and QoL with selected demographic variables (age, gender, education, occupational status and monthly income) $p >0.05$.

Relationship between pain and QOL: The findings of the study revealed that there is a negative relationship between pain and QOL, which indicates that as pain increases the QOL decreases (Fig-5)

Discussion

Effectiveness of Music therapy on Pain

The present study revealed a significant difference in pain in all the 5 consecutive days of the intervention ($p< 0.05$), Wilcoxon signed rank test (Z) showed that there is a significance difference in level of pain between pre-test

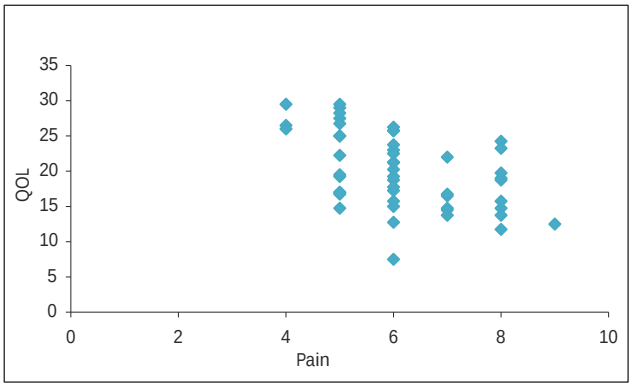

Fig. 5 : Scatter diagram depicting the Relationship between baseline pain and QoL

and post-test in the experimental group ($p < 0.05$) compared to the control group and Mann Whitney U test showed a significance difference in pain between the experimental and control group ($p < 0.05$). These findings signified that music therapy is effective in reducing pain among the cancer survivors.

Similar findings were found in a study conducted by Kaliyaperumal R & Subash JG *(2010)* [5], Krishnaswamy P (2013) [6]; Jasemi et al (2013)[7]; Gomez et al (2015)[8]; and Huang et al [9] (2010) which revealed that music therapy is an effective intervention for reducing pain among cancer patients. ($p < 0.001$).

Effectiveness of Music Therapy on Quality of life

The present study revealed a significant impact of music therapy on the physical and psychological domain of Quality of life and the impact was seen on day-1, day-6 and day-10 for both within and between groups ($p < 0.05$), except for existential domain of between group ($p > 0.05$)

These findings are well supported by a systematic review conducted by Zhang et al (2012) on music interventions for psychological and physical outcomes in cancer which revealed that music therapy has positive effects on the anxiety, pain, and improved depression and quality of life of cancer patients.[10]

Another similar study was conducted by Awikunprasert et al (2012), which revealed that the quality of life of cancer patients is better starting from week 12th after exposure to music.[11]

Conclusion

Cancer diagnosis and treatment is one of the most fearful and serious life events which disrupts the general well being of the patients and we know that despite of recent advancement in the curing of the cancer diseases, it still remains one of the major health problem not only national but also worldwide. In order to help the patients to improve their general well being, the complementary therapies are beneficial compared to the conventional medical therapy. Hence it is recommended that music therapy to be integrated in the care of patients with cancer as it is aimed not to cure the disease, but to give a positive impact on the psychosocial as well as physical well-being of the patients.

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