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Therapeutic Use of Music and Exercise Program on the Quality of Life in Thai Cancer Patients

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Abstract: World Health Organization has estimated that there will be an increasing number of deaths from cancer in the near future. Cancer has become one of the most discussed topics in medicine and science. In this study, researchers focus on the quality of life of cancer patients by using music and exercise therapies and to observe the difference between pre-test and post-test results with music and exercise treatments. The aim of the study is to examine the alternative therapies using of music and exercise programs to enhance the quality of life, using the hospice quality of life index-revised in cancer patients. Twenty one cancer patients were divided into four different groups; the control group followed their routine schedules; the music group received additional music therapy with a music leader; the exercise group participated in an exercise program under supervision of a professional trainer and a group who received a combination of music therapy and an exercise program on the same day. The results from both questionnaires, collected during 4th, 8th and 12th week, showed that the music and exercise group had the most significant improvement compared to the other three groups. This suggested that the combination of music and exercise has the most potential to increase the quality of life for the cancer patients. It can be concluded that the music and exercise treatment is a good model to improve both psychological and physiological conditions. The treatment can also be used in general clinics or hospitals as an alternative treatment for cancer patients.

Key words: Music, exercise, quality of life, cancer patient, music therapy, treatment

INTRODUCTION

Cancer is a major public health problem that threatens human life, mainly due to the long-term treatment with associated serious side effects. The treatments and their side effects have caused significant economic impact on human resources and social development of countries. Cancer has caused about 13% of all human deaths in 2007 (ACS, 2008). Each year 10.9 million people worldwide are diagnosed with cancer and there are 6.7 million deaths from the disease. It is estimated that there are 24.6 million people alive who have received a diagnosis of cancer in the last 5 years. The World Health Organization (WHO) in 2006 has estimated by the year of 2020; there will be >11 million deaths from cancer throughout the world. In the United States, cancer is the second cause of death after cardiovascular disease. It affects people at all ages with the risk for most types increasing with age (ACS, 2008). The trend of cancer in Thailand is increasing in line with other countries around the world. According to statistics for 2007 from its Bureau of Policy and Strategies, the Ministry of Health announced that the mortality rate of patients with cancer was growing every year and the number one cause of death in Thailand since, 2003. The National Cancer Institute in 2008 also estimates that Thailand will have 120,000 new cancer patients and will increase by another 50% in the next 10 years (National Cancer Institute, 2008).

Cancer is a chronic disease associated with mental health. Spiritual discipline and proactive positive thinking may aid in surviving the battle with cancer. Body tension derived through anger, bitterness, worry and stress which are indicators in the early stages of cancer, of non-acceptance of the disease may in fact heighten and compound the problems. These initial concerns may be mitigated through acceptance which may allow for some remission (Onnchomjun, 2008). Cancer cells cannot grow in an environment that organism has enough oxygen (Mustian *et al*., 2004). Routine exercise and deep breaths help the body get oxygen up into the chest and into the cellular level (Mustian *et al*., 2004). Delbruck concluded that the changes of physical symptoms that accompany

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cancer may cause the patients to become weak in mind and body. This weakness and associated hopelessness of self-awareness might separate or isolate patients from the social environment. Both physical and mental conditions are the factors that trigger mental illness; therefore it is important to help patients, especially in terms of mental stimulation in order to fight the disease and pain management. He also found that body massage and music therapy can be methods of mental stimulation which help patients confront their illness and gain motivation (Delbruck, 2007). Some cancer patients use therapies as literal alternatives to conventional medical care. However, the alternative therapies are unproven or were studied and found to be worthless and even in some circumstances can be harmful (Delbruck, 2007; Cassileth and Deng, 2004). In addition, a greater proportion of cancer patients use complementary therapies along with mainstream cancer treatments (Cassileth and Deng, 2004). Most are helpful adjunctive approaches that control phenomenon and magnify the quality of life (Delbruck, 2007; Cassileth and Deng, 2004).

Music therapy is an easy, inexpensive way to help cancer patients cope with the emotional upset often caused by high-dose chemotherapy and autologous stem cell transplantation (Cassileth *et al*., 2003). Patients who were visited by a trained music therapist reported less anxiety and better overall mood than patients who did not receive music therapy (Cassileth and Deng, 2004). According to Cassileth *et al*. (2003), 28% of 69 cancer patients showed anxiety reduction and 37% on disturbance reduction (Cassileth *et al*., 2003).

Physical exercise is important for maintaining physical fitness and can contribute positively in maintaining a healthy weight, building bone density, muscle strength, joint mobility, promoting physiological well-being reducing surgical risks and strengthening the immune system. Exercise also reduces levels of cortisol, a stress hormone thereby benefiting health. Cortisol causes many health problems, both physical and mental (Mustian *et al*., 2004; Cohen and Williamson, 1991). The quality of life is used to evaluated the general well-being of individuals, societies and healthcare but also the built environment, physical and mental health, education, recreation and leisure time and social (McMillan and Weitzner, 1998). Consequently, the combination of music and physical activities should benefit health and quality of life among cancer patients. The aim of this study is to examine the use of music and exercise programs to enhance the health and quality of life in cancer patients.

MATERIALS AND METHODS

Volunteer participants were classified as stage 3-4 (terminal stage) of cancer patients who received hospice care. They were treated at the Arokhayasala Foundation, Sakonnakhon province in Thailand. These patients were randomly assigned into four groups, control group (n = 6); music group (n = 5), exercise group (n = 5); music and exercise group (n = 5). The patients were treated with drug chemotherapy, radiation therapy or surgery before being treated at the Arokhayasala Foundation, Thailand. The medical doctors and nurses evaluated the participants for suitability for the study upon admission into the hospice program. All participants were assigned to one of the four study groups. The Burapha University Ethics Committee, Thailand approved the protection of the human rights of the participants of this study.

After the patients had signed the agreement to participate in the study, a nurse collected saliva samples within 48 h. The salivary was sent for cortisol analysis using Western blot process (Hempelmann *et al*., 1987). After saliva collection, the participants were asked to conduct the Hospice Quality of Life-Revised (HQLI-R) (McMillan and Weitzner, 1998). The exercise program used in the study included walking or Tai Chi Chuan activities for 30 min, 5 days week^{-1}, led by a professional trainer. There were singing and praying activities for 30 min, 5 days week^{-1} for the music session. The participants received their doctor's permission to get involved in the exercise group since those in the 3rd or 4th stages of the cancer might be vulnerable in terms of mobility.

All of the data collected including the results from questionnaires and cortisol were analyzed using the Software Package of Social Statistic/Personal Computer (SPSS/PC) Version 11.5. Non-parametric scale was calculated with Kruskal Wallis test and Friedman test. The Mann-Whitney U-test was also used when statistical significance was found. The statistical significance of this study was set at $p<0.05$.

RESULTS AND DISCUSSION

Characteristics of cancer patients: The mean age of participants was 52.76 (range 40-72 years of age). The majority of study patients were classified as Stage 3 (61.9%) with the rest at Stage 4 (38.1%). Most of the patients were married (n = 15, 71.4%) and 10 out of them were primary school educated (47.6%). The main occupation was farmer (n = 15, 71.4%) (Table 1).

Comparison between levels of quality of life

Between group comparisons: The Kruskal Wallis test analyses comparing the control and experimental groups which showed no significant difference wee on week except in the 12th week of the experiment (p = 0.007) are shown in Table 2. Improvement in the quality of life of cancer patients was found in the 12th week. During this experimental week (12th) there was a significant statistical difference from the control group (Mean = 7.80±0.50) to the exercise group (Mean = 8.67±0.61) (z = -2.29, p = 0 .017) as well as the music and exercise groups (Mean = 9.14±0.50) (z = -2.35, p = 0.019). There was also a significant statistical difference between the music group (Mean = 7.62±0.48) the exercise group (Mean = 8.67±0.61) (z = -2.20, p = 0.028) and the music and exercise group (Mean = 9.14±0.50) (z = -2.34, p = 0.019). At the same time, the table also represents the comparison between groups of study at pre, 4th and 8th weeks. During pre (p = 0.246), 4th (p = 0.083) and 8th (p = 0.413) week, there was no significant improvement in the quality of life in all experiment groups (p>0.05).

Within group comparison: The mean differences of quality of life of the control and exercise groups using Friedman test, between week 4, 8 and 12 after treatment shows significant differences when compared with pre-test (p = 0.001-0.007). Being at Arokhayasala Foundation gave cancer patients a greater quality of life. All cancer patients who participated experienced a greater quality of life after taking part in the study (Table 2).

The change of quality of life found in current study would reflect and document the efficiency of the traditional medication and well-being of the cancer patients. The current study indicates that music can enhance the quality of life after 12 weeks of treatment and supports that the quality of life of cancer patients listening to music was higher and improved when compared to the previous experiment (Hilliard, 2003). Health Day reports music can improve the well-being of very sick patient especially life-limiting diagnoses patients (Mozes, 2011). The value of music therapy was recognized as a powerful anxiolytic treatment in helping dying patient become more engaged with others (Kubler, 1974). Listening to music can lower the score of pain in cancer patient (Pittman, 2011). Stanford Hospital and Clinics offer music in the patient room, especially for end of life situations. The doctors believe that bedside music can provide healing value and comfort to both the patients and the visitors (Stanford Hospital and Clinics, 2011).

The cancer patients had a better quality of life after being involved in the exercise program using walking exercise and Tai Chi Chuan exercise after 12 weeks. The exercise program is not too complicated for cancer patients at Stage 3 and 4. Additionally, Tai Chi Chuan has been able to improve the self-esteem and quality of life in breast cancer survivors (Mustian *et al*., 2004). By practicing Tai Chi Chuan, breast cancer survivors increased their functional capacity significantly more than the control group that did not participate (Mustian *et al*., 2006). Exercise is gradually becoming recognized as an important treatment for the recovery and rehabilitation of cancer survivors. The findings from previous reviews and meta-analyses suggest that exercise reduced a range of physical and psychological complaints after cancer treatment. Physical exercise after cancer diagnosis consistently has also found a positive effect on the quality of life including physical, functional,

Table 1: The characteristics of cancer patients (N = 21)

	Study groups									
	Control		Music		Exercise		Music and exercise		Total	
Characteristics	n	%	n	%	n	%	n	%	n	%
Status										
Single	-	-	2	40.0	1	20.0	1	20.0	4	19.0
Married	6	100	2	40.0	3	60.0	4	80.0	15	71.4
Divorce	-	-	1	20.0	1	20.0	-	-	2	9.6
Education										
Primary school	2	33.3	4	80.0	3	60.0	1	20.0	10	47.6
High school	4	66.7	1	20.0	1	20.0	2	40.0	8	38.1
Other	-	-	-	-	1	20.0	2	40.0	3	14.3
Occupation										
Merchandise	2	33.3	-	-	1	20.0	-	-	3	14.3
Business owner	1	16.7	-	-	1	20.0	1	20.0	3	14.3
Farmer	3	50.0	5	100.0	3	60.0	4	80.0	15	71.4
Patient stage										
Stage 3	4	66.7	4	80.0	3	60.0	2	40.0	13	61.9
Stage 4	2	33.3	1	20.0	2	40.0	3	60.0	8	38.1

Table 2: Means±SD Quality of Life (QOL) of cancer patients between pre-test, 4th, 8th and 12th weeks

	Mean±SD				
QOL	Pre-test	4th week	8th week	12th week	p-value[A]
Control	4.67±0.51	6.04±1.18*	7.23±0.86*	7.80±0.50*[a]	>0.001
Music (M)	4.35±0.46	5.81±0.38*	7.29±0.58*	7.62±0.48*[a]	0.002*
Exercise (E)	4.92±0.48	7.47±1.12*	7.95±0.82*	8.67±0.61*[b]	0.004*
M and E	5.28±1.13	6.76±0.77*	7.96±1.01*	9.14±0.50*[b]	0.007*
p-value[B]	0.246	0.083	0.413	0.007*	

*p<0.05 (ranging from 0.027-0.048) (between pre and post-test using Mann-Whitney U-test; [A]p-value from Friedman test; [B]p-value from Kruskal Wallis test (a, b results with the same letter are not statistically different (between group)

psychological and emotional wellbeing (Schwartz *et al*., 2001). Music together with exercise can help cancer patients to improve their quality of life. Hands clapping, singing and also praying along with music followed by the easy exercise program at Arokhayasala Foundation improve these patients' quality of life. A recent study also indicated that music therapy and rhythmic exercise have positive effects on the quality of life, especially on vitality, general health and mental health (Jeon *et al*., 2009). The increase in the quality of life of cancer patients in week 12 of the study indicates that improving these cancer patients with music or music along with exercise is better than the ordinary treatment powered by Arokhayasala Foundation. This study indicates that every treatment provided shows positive improvement across time including the ordinary treatment at Arokhayasala Foundation. Being at Arokhayasala Foundation has its own positive effects to their cancer patients.

CONCLUSION

This study aimed to determine the effectiveness of a music and exercise program on the quality of life in cancer patients. The music and physical activity program was simple and effective when undertaken by the cancer patients. The quality of life of cancer patients was better starting from week 12 after implementation of the music, exercise and music and exercise programs. The ordinary treatment at Arokhayasala Foundation of providing participation activities, cooking, gardening, praying and listening to the monks and also taking herbal medication shows more effectiveness on quality of life.

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