Original Articles/นิพนธ์ต้นฉบับ

Feasibility of Musical Prayer to Enhance the Quality of Sleep in Persons with Ovarian Cancer.

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Abstract

This quasi-experimental research study contained a one group pretest posttest design and was carried out to investigate the feasibility of musical prayer to enhance the quality of sleep in persons with ovarian cancer. The purposive sample was selected using inclusion criteria of 10 ovarian cancer patients treated with chemotherapy at the Gynecologic Oncology Unit of Ramathibodi Hospital in Bangkok, Thailand. Participants were assigned to listen to musical prayers approximately 45 minutes before sleeping for 27 days. Before and after intervention they were completed the Thai Depression Inventory, the Pittsburgh Sleep Quality Index (Thai version), and a semi-structured interview on the quality of sleep. Data were analyzed using descriptive statistics, Paired t-test and Wilcoxon Signed-rank Test.

The results revealed that after listening to musical prayer, participants showed significant increase in global sleep quality and perceived sleep quality compared to before intervention. Sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleeping medication and daytime dysfunction also improved within period of musical prayers, but without statistical significance. The participants were satisfied with musical prayers at the highest level. They also suggested applying this modality with other cancer persons to improve their quality of sleep. The study suggests that the application of musical prayers to enhance the quality of sleep in persons with ovarian cancer should take into account the personal characteristics of each individual. Further study related to the most effective means of using musical prayers on persons with ovarian cancer at the hospital and at home should be conducted.

Keywords: Musical prayer, quality of sleep, persons with ovarian cancer

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Background and Significance

Women diagnosed with ovarian cancer become aware that their daily living conditions will change as they feel uncertainty, fear, and anxiety[1,2]. Anxiety affects sleep disturbance[3]. Numerous studies have found 30-50% of cancer patients suffering from sleep disturbance[4-6], 29.4% of female patients with reproductive organs cancer having insomnia[7] and 36% of ovarian cancer patients having difficulty sleeping[1]. "Quality of sleep" is a significant factor influencing the quality of life and the well-being of people[8]. Poor quality of sleep will lead to fatigue and ineffective daily life activities in cancer persons[9]. Other impacts include poor concentration, forgetfulness, mood swings[6,7], increased stress[4] and poor quality of life [10].

Variations in sleeping patterns can be treated by pharmacological and non-pharmacological treatments in cancer persons[4]. Pharmacological treatments such as benzodiazepines result in withdrawal and drowsiness, which will reduce learning and memorizing capabilities all day following use of the medication. As a result, persons may fall and become addicted to sedative medicine[6]. By contrast, non-pharmacological treatments, which have rarely much effect, are used as alterative methods to improve quality of sleep in cancer persons[4] such as relaxation techniques, meditation[11,12], yoga[13] cognitive behavioral therapy[14] and music therapies[15].

Musical modality can bring body, mind and spirits to be the one. However, the mechanism of music has not been known yet. In 1951, Gaston said that the tempo of music equals pulse rate (60-80 times/ minute) without percussion or syncopation[15] can reduce anxiety and cortisols in the bloodstream[16], increase relaxation[17] and enhance quality of sleep[15,18]. Likewise, musical prayers, drums and bells can radiate healing power[19] by bringing the body and mind as the whole through the nervous, endocrine and immune systems of the body, which will increase relaxation and promote quality of sleep[20].

Prayer is also important for ill patients[21] to improve mental health status[22], illness and spiritual well-being[23]. The soft prayers will reduce respiratory rate, heart rate, blood pressure, body temperature, and pain as well as promote sleeping[20]. The researchers realizes the importance of musical prayers in helping to restore the physical, mental and spiritual health of ovarian cancer persons. However, application of musical prayer to promote quality of sleep in cancer persons has had limited studies. Therefore, this study aimed to test the feasibility of the implementation of musical prayers to enhance the quality of sleep in persons with ovarian cancer undergoing chemotherapy.

Conceptual Framework

This research is based on psychoneuroimmunology concept, a belief that there is a mind body connection among the nervous, endocrine and immune systems of the body[24]. The body responds to stress through the autonomic nervous system and hypothalamic-pituitary-adrenal axis[25] by sending nerve impulses from the peripheral nervous system through the spinal cord (spinothalamic pathways) to stimulate reticular formations which will send nerve impulses forward to the thalamus and from the thalamus to the cerebral cortex, which is a network for stimulating nerve fibers called the reticular activating system (RAS) being associated with consciousness. The RAS also receives signals from the peripheral nerves and the hypothalamus, and sends them to the limbic system located in the midbrain functioning on perceptions of emotions, feelings and behaviors. In the mean time, hypothalamus also receives trauma stimuli through the spinothalamic pathway, which is pressure sensitive from baroreceptors through the brainstem and emotional stimuli through the limbic system, triggering secretions of corticotrophin-releasing hormones to stimulate the anterior pituitary to secrete adreno-

corticotrophic hormones, and thus causing increased sleep latency, reduced sleep duration and reduced sleep efficiency[26]. Stimulation of the adrenal cortex to secrete cortisols will cause reduced slow wave sleep[27].

The sound waves from musical prayers will send nerve impulses to the cochlear and the auditory nerve to stimulate the amygdale basolateral region (ABL) in order to inhibit secretions of corticotrophin-releasing hormones (CRH) from the hypothalamus causing decreased ACTH from the anterior pituitary gland[28], reduced sleep latency, increased sleep period time and enhanced sleep efficiency[26]. As for reduced level of cortisols[28], it will cause increased slow wave sleep[27]. Furthermore, it will also help reduce the secretion of norepinephrine, which has an effect on sleeping[29] and turns the beta waves in the brain into alpha waves and theta waves, leading to better quality of sleep[30].

Objectives

1. To study quality of sleep in persons with ovarian cancer undergoing chemotherapy before and after listening to musical prayers.
2. To compare the quality of sleep in persons with ovarian cancer undergoing chemotherapy before and after listening to musical prayers.
3. To study the feasibility of implementation of musical prayers to enhance the quality of sleep in persons with ovarian cancer undergoing chemotherapy.

Method

This study is a quasi-experimental research study, a pretest-posttest design.

Sample

The participants comprised 10 ovarian cancer persons who were treated by chemotherapy at the Gynecologic Oncology Unit, Ramathibodi Hospital between June and December 2009. The participants were selected by purposive sampling according to inclusion criteria i.e. diagnosis with ovarian cancer and undergoing carboplatin chemotherapy with paclitaxel between the 2^{nd}-6^{th} cycles at the age of 18-59 years, ability to communicate, no consumption of beverages or other medications affecting sleeping pattern, no history of seizures, brain trauma, psychiatric problems, thyroid disease and cancer pain. The participants also had white blood cell ≥1,500 cells/mms^3, five scores or more for global sleep quality and willingness to participate in the research. The exclusion criteria consisted of lung metastasis, abdominal fluids, infections, readmission to hospital, more than 21 depression scores and listening to musical prayers for less than 14 days.

Instruments

Musical prayers of the Rama IX Golden Jubilee Temple in Bali and Thai consists of five songs: the Namaskarn Praputhachao, Ittipisophakhwa, Pa Hung Ma Ha Ga, Chinabanchorn, and Yathasaphee in a harmonious mixed with constant rhythm, soft low sounds and tempo of approximately 60-80 times per minute recorded on a CD with approximately 45 minutes.

The demographic questionnaire includes age, marital status, religion, level of education, occupation, type of residence, type of favorite music, type of favorite songs, reasons for listening to music, listening to music before sleeping and practice of Buddhist activities.

The Thai Depression Inventory (TDI) developed in 1999 by Manot Lotrakul and Pramot Sukanich comprise 20 items[31]. Each item yields a score of 0-3. A total possible score of the TDI ranges from 0-60, a higher score indicates higher depression. The reliability value in accordance with Cronbach's alpha coefficient in this study was equal to .70.

The Pittsburgh Sleep Quality Index (PSQI) developed in 1989 by Buyssee and colleagues[32]

was translated into Thai version by Tawanchai Jirapramookpitak and Waran Tanchaiyasawat[33] and used in measuring quality of sleep of the participants. The PSQI comprises 7 dimensions: perceived sleep quality, sleep latency (time needed to fall asleep), sleep duration (number of sleep hours a night), habitual sleep efficiency (total sleep time divided by time in bed), sleep disturbance, use of sleep medication and daytime dysfunction[8]. Each item of the PSQI yields a score of 0-3, therefore the possible score ranges from 0-21. A total score more than 5 indicates poor quality of sleep. The Cronbach's alpha coefficient in this study was .70.

Data Collection Procedure

After receiving approval from the Ethics Committee on Research in Human Subjects, Faculty of Medicine Ramathibodi Hospital, Mahidol University, participants were explained the objectives and details of the study and asked for informed consent. Before intervention, the participants were asked to complete the questionnaires: a demographic questionnaire, the TDI[31], and the PSQI[33]. Each participant was also interviewed using a semi-structured interview guideline for searching meaning of quality of sleep. All interviews were recorded after the permission. After that, they were assigned to listen to musical prayer starting on the second day of receiving chemotherapy before bedtime approximately 45 minutes for 27 days. After intervention, they completed the same questionnaires including the feasibility in the implementation of musical prayers questionnaire.

Subjects' Right

The researcher strictly adhered to ethical principles in the research by collecting data from the participants who were willing after receiving approval from Ethics Committee for Research in Human Subjects, Faculty of Medicine Ramathibodi Hospital. The data collection was confidential and the participants were able withdraw from the research at all times with no impact on treatments. Data will be revealed only in necessary cases with academic causes and disseminated in the form of a summary of research findings.

Data Analysis

Data were analyzed using descriptive statistics. A Paired t-test and Wilcoxon Signed-rank test were used to compare the quality of sleep before and after intervention. Qualitative data of quality of sleep were transcribed verbatim and analysed by using content analysis to enhance important issues for discussion.

Results

The participants were 10 ovarian cancer persons undergoing chemotherapy who listened to musical prayer more than 14 days without readmission before next chemotherapy cycle. Table 1 contains demographic and music behavior information. Table 2 and 3 display results detailing quality of sleep before and after intervention. After listening to musical prayers, global sleep quality and perceived sleep quality significantly improved compared to before the program ($p < .05$, $p < .01$, respectively). Sleep latency, sleep duration, sleep efficiency, sleep disturbance, use of sleeping medication and daytime dysfunction also improved within the period of musical prayers, but with no statistical significance. Nevertheless, when numerical changes of participants were compared between before and after listening to musical prayers, it was found that half of the participants experienced decrease in sleep latency and did not encounter changes on daytime dysfunction. Most participants had no changes of sleep disturbance and global sleep quality (Table 3). Finally, Table 4 shows opinions

Table 1 Demographic and music behavior information of persons with ovarian cancer undergoing chemotherapy (n=10)

Variables	n
Age (years)	
30-39	2
40-49	6
50-59	2
(mean 45.3, S.D. = 6.60, range = 33-55)	
Marital status	
Single	6
Married	4
Religion	
Buddhism	10
Education	
Elementary school	1
Diploma/Certificate	1
Bachelor/Higher	8
Occupation	
Government officer	5
Government enterprise	1
Employee	3
Unemployed	1
Residence	
House	6
Town house	3
Condominium	1

Variables	n
Type of music favour	
Pastorale	3
Modern Thai song	4
Traditional Thai song	1
Pastoral and Modern Thai song	2
Character of music favour	
Vocal song	8
Vocal song & Melody	2
Reason for listen to music	
Recreation	5
Stress reduction	2
Joy	2
Recreation, stress reduction, joy and exercise	1
Listen to music before bedtime	
No	4
Yes	6
Religious activity	
Prayer	10
Listen to prayer	
No	8
Yes	2
Meditation	
No	5
Yes	5

regarding feasibility of the implementation of musical prayers to enhance quality of sleep in persons with ovarian cancer undergoing chemotherapy. The participants also recommended that musical prayers should be used with audio equipment without headphones and should be allowed to determine the duration and time period of listening themselves.

Discussion

The research findings revealed that after listening to musical prayer the global sleep quality and the perceived sleep quality significantly improved though other components were not significant. Congruently, some participants said that "I sleep fast within the first song (Namaskarn Praputhacho). This is different from previous time"; Or "I don't feel worried about anything since my mind pays attention with musical prayer"; And "Musical prayer helps me well." This might result from musical dharma prayers helping calm the soul and releasing their suffering resulting in improving quality of sleep[34]. Musical prayers are thought to decrease psychological stress from

persons's illness since the sound will be sent via the cochlear in the inner ear to the medulla, pons, thalamus and temporal lobes, thus triggering the amygdale basolateral region, inhibiting secretions of corticotrophin-releasing hormones from the hypothalamus and reducing adrenocorticotrophic hormone secretions from the anterior pituitary[26]. The brain stem releases serotonin, a neurotransmitter with effects similar to sedative medicine, thereby improving quality of sleep[35]. Moreover, the sound has effects on the automatic nervous systems in the area of the locus ceruleus and sympathetic nervous system performance [28] resulting in innate relaxation[36]. This physiology is congruent with a participant's word "I have no stress as before, no worry or anxiety too. Before my mind was distracted, now I have no stress. My mind is calmed down by Dharma. Musical prayers can help a lot."

This finding supported many studies in that musical prayer significantly increased global sleep quality[37,38]. However, few studies, carried out in the elementary school students and older adults, found that sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance and daytime dysfunction significantly improved[15,39]. These differences might result from the distinction participants, who in this study were ovarian cancer persons who were unhealthy person compared to the two studies and were aware of uncertainties and anxiety. Also, paclitaxel chemotherapy medication has neurotoxicity effects, which causes pain, myelosuppression and nephrotoxicity affecting quality of sleep[40].

It was also found that half of participants had reduced sleep latency after listening to musical prayers because musical prayers innate relaxation[41]. However, sleep disturbance, daytime dysfunction and global sleep quality had no changes, which was in agreement with the research of Smith and colleagues[42]. This might be due to the uncertainty and fear of recurrence of the disease, level of resistance to medications and side-effects of chemotherapy that had more influence sleep quality and caused greater impacts on sleep disturbance, daytime dysfunction and global sleep quality in the participants[1,2,7,9].

Table 2 Comparison of quality of sleep of persons with ovarian cancer undergoing chemotherapy before and after listening to musical prayers (n=10)

Sleep quality components	Before listening to musical prayers			After listening to musical prayers			t-value[a]	z-value[b]
	range	mean	SD	range	mean	SD		
Perceived sleep quality	1-2	1.80	.42	0-2	.90	.57	-	-3.00**
Sleep latency	2-4	2.80	.79	0-5	2.20	1.48	.97[ns]	
Sleep duration	0-3	1.30	.82	0-3	1.10	.88	1.00[ns]	
Habitual sleep efficiency	0-3	1.00	1.25	0-3	.90	1.29	.36[ns]	
Sleep disturbance	1-15	8.10	4.07	2-15	6.90	4.28	.84[ns]	
Use of sleep medication	0-2	1.10	.99	0-1	.60	.52	1.46[ns]	
Daytime dysfunction	1-3	2.00	.94	0-3	1.90	1.10	.24[ns]	
Global sleep quality #	6-14	9.50	2.51	3-16	7.30	3.62	2.90*	

a = Paired t test, b = Wilcoxon Signed-rank test, ns = non significance.

* $p < .05$, ** $p < .01$, # Score ≥5 indicates poor quality of sleep.

Table 3 Number changes of persons with ovarian cancer related to sleep quality components (n=10)

Changes of sleep quality components	Numbers of persons with ovarian cancer undergoing chemotherapy		
	Less	Same	More
Sleep latency	5	3	2
Sleep disturbance	1	9	0
Daytime dysfunction	3	5	2
Global sleep quality	0	7	3

Table 4 Opinions regarding feasibility of the implementation of musical prayers to enhance quality of sleep in persons with ovarian cancer undergoing chemotherapy (n=10)

Feasibility	Amount
Listening to musical prayers before sleeping helps you feel peaceful.	
Yes	10
You would like to listen to musical prayers before sleeping next time.	
Yes	8
No	2
You want to listen to musical prayers every time when you cannot sleep.	
Yes	6
No	4
What are your favorite songs in the program for listening to musical prayers?	
Song 1: Namaskarn Praputhacho	1
Song 3: Pa Hung Ma Ha Ga	3
Song 4: Chinabanchorn	1
Songs 2, 3: Ittipisophakhwa, Pa Hung Ma Ha Ga	1
Songs 1,2,3: Namaskarn Praputhachao, Ittipisophakhwa, Pa Hung Ma Ha Ga	1
Songs 3,4,5 : Pa Hung Ma Ha Ga, Chinabanchorn, Yathasaphee	1
Every song : Namaskarn Praputhacho, Ittipisophakhwa, Pa Hung Ma Ha Ga, Chinabanchorn, Yathasaphee	2
Implementation of musical prayers to enhance quality of sleep in cancer persons.	
Suitability	10
Musical prayers should be implemented in the care of other cancer persons.	
Yes	10
Overall satisfaction for listening to musical prayers.	
Extreme Satisfaction	3
Very satisfaction	6
Unsatisfaction	1

Congruently, some participants said that "It caused more pain, numbness of hands and feet;" Or "After that, hot flushes are much more, I feel very cool and warm;" And "It seems stress. Because during the first time I feel stronger. I have many drug reactions. Now I feel worse. Sometime I feel pain and cannot sleep." Therefore, promotion of sleep quality in cancer persons requires a combination of several techniques, such as stimulus control therapy, sleep hygiene education, sleep restriction and other relaxation therapies[43] resulting in quality of life and well-being.

Study Limitations

First, the participants were selected by purposive sampling and small sample size, which resulted in limitations of generalization for the ovarian cancer population. Second, musical prayer is the appropriate equipment for Buddhists resulting in limitations in application for populations with ovarian cancer in other religions. Third, this research was conducted at the residences of the participants where the researcher was unable to control factors in the setting, such as lights, sounds or other disturbances which might affect the participants' sleep. Lastly, the participants undergoing chemotherapy with Taxanes experienced pain, which was a supporting factor for sleeping problems.

Recommendations

1. The implementation of musical prayers to enhance quality of sleep in cancer persons can be a guideline in comprehensive health care combining science and religion. Therefore, it should be included in nursing education since musical prayers are independent roles that can be performed by nurses and based on Thai people's believe and culture which most of them are Buddhist.

2. Further studies should be compared on the effects of musical prayers, musical prayer and natural sound, and prayer on sleep quality in persons with ovarian cancer by increasing the sample size.

3. In the area of nursing practice, musical prayers should be implemented in the promotion and rehabilitation of persons with ovarian cancer in the hospital and at home by considering preferences, cultural diversity, religion, and individual beliefs.

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Original Articles/นิพนธ์ต้นฉบับ

การศึกษาความเป็นไปได้ของการใช้บทสวดมนต์ประกอบดนตรีในการส่งเสริมคุณภาพการนอนหลับของผู้ที่เป็นมะเร็งรังไข่

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บทคัดย่อ

บทนำ การศึกษาครั้งนี้เป็นการวิจัยแบบกึ่งทดลอง ชนิดกลุ่มเดียววัดก่อน- หลัง เพื่อศึกษาความเป็นไปได้ของการใช้บทสวดมนต์ประกอบดนตรีในการส่งเสริมคุณภาพการนอนหลับของผู้ที่เป็นมะเร็งรังไข่ที่ได้รับยาเคมีบำบัด ณ หน่วยมะเร็งนรีเวชวิทยา โรงพยาบาลรามาธิบดี กลุ่มตัวอย่างได้รับการเลือกแบบเฉพาะเจาะจงตามเกณฑ์คุณสมบัติที่กำหนด จำนวน 10 ราย และฟังบทสวดมนต์ประกอบดนตรีก่อนเข้านอนที่บ้านเป็นระยะเวลา 27 วัน เก็บข้อมูลโดยใช้แบบสัมภาษณ์ข้อมูลส่วนบุคคล แบบประเมินความรุนแรงของภาวะซึมเศร้า แบบประเมินคุณภาพการนอนหลับพิทสเบอร์ก (ฉบับภาษาไทย) และการสัมภาษณ์เชิงคุณภาพเกี่ยวกับคุณภาพการนอนหลับ ก่อนและหลังการฟังบทสวดมนต์ประกอบดนตรี วิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณา Paired t-test และ Wilcoxon Signed-rank test

ผลการศึกษา พบว่า หลังฟังบทสวดมนต์ประกอบดนตรีกลุ่มตัวอย่างมีคะแนนเฉลี่ยคุณภาพการนอนหลับโดยรวม และคุณภาพการนอนหลับเชิงอัตนัยดีกว่าก่อนฟังอย่างมีนัยสำคัญทางสถิติ คะแนนเฉลี่ยระยะเวลาตั้งแต่เข้านอนจนกระทั่งหลับ ระยะเวลาของการนอนหลับในแต่ละคืน ประสิทธิภาพของการนอนหลับโดยปกติวิสัย การรบกวนการนอนหลับ การใช้ยานอนหลับ และผลกระทบต่อการทำกิจกรรมในเวลากลางวัน ดีกว่าก่อนฟังบทสวดมนต์ประกอบดนตรี แต่ไม่พบความ แตกต่างอย่างมีนัยสำคัญทางสถิติ กลุ่มตัวอย่างส่วนใหญ่มีความพึงพอใจโดยรวมมากที่สุด และมีความเห็นว่าควรนำบทสวดมนต์ประกอบดนตรี มาใช้เพื่อส่งเสริมคุณภาพการนอนหลับในผู้ที่เป็นมะเร็งกลุ่มอื่น ผลการศึกษามีข้อเสนอว่า การนำบทสวดมนต์ประกอบดนตรีมาใช้ในการส่งเสริมคุณภาพการนอนหลับของผู้ที่เป็นมะเร็งรังไข่ ควรพิจารณาปัจจัยส่วนบุคคล และควรศึกษาเพิ่มเติมเกี่ยวกับวิธีการประยุกต์ใช้บทสวดมนต์ประกอบดนตรีเพื่อให้เกิดประสิทธิผลมากที่สุด ต่อผู้ที่เป็นมะเร็งรังไข่ทั้งในโรงพยาบาลและที่บ้าน

คำสำคัญ: บทสวดมนต์ประกอบดนตรี คุณภาพการนอนหลับ ผู้ที่เป็นมะเร็งรังไข่

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