科技部補助專題研究計畫成果報告
期末報告

頭頸部癌症病人之疲憊與睡眠之日夜節律措施成效探討

計 畫 類 別 ： 個別型計畫
計 畫 編 號 ： MOST 102-2314-B-040-003-
執 行 期 間 ： 102年08月01日至104年07月31日
執 行 單 位 ： 中山醫學大學護理學系（所）

計 畫 主 持 人： 廖玟君
共 同 主 持 人： 蔡秀婷
計畫參與人員： 碩士班研究生-兼任助理人員：游馥蓮

報 告 附 件 ： 出席國際會議研究心得報告及發表論文

處 理 方 式 ：
1.公開資訊：本計畫涉及專利或其他智慧財產權，1年後可公開查詢
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中 華 民 國 104 年 11 月 06 日

中 文 摘 要 ： 睡眠障礙與疲憊是癌症病人治療中或治療後最常見的問題，主要是由疾病本身或抗癌藥物所引起的。癌症病人之疲憊、睡眠障礙、與憂鬱三者之間共同的機轉在於發炎物質cytokines的釋出。此外，依照日夜節律的運行可降低抗癌藥物的副作用並維持身體功能在最佳運作狀態。本研究為三年期研究計畫，使用隨機分派實驗性研究設計，檢測合併運動(早上與傍晚散步)與按摩處置(睡前使用按摩墊)的日夜節律措施對頭頸部癌症病人進行化學治療或放射線治療期間之發炎物質cytokines、自主神經功能、節律型態、睡眠、情緒、與疲憊之成效。研究個案從病房個案邀請而來，並隨機分成三組:運動組、按摩組、依日夜節律合併運動與按摩處置組。每一位研究個案依據其組別接受3天的處置。研究結果將比較治療措施前後之發炎物質cytokines、自主神經功能、節律型態、睡眠、情緒、與疲憊之成效。52位頭頸部癌症病人年齡 52.5+-6.5 歲隨機被分至運動組 (EG, n=21)、按摩組 (MG, n=15)或運動與按摩合併處置組 (CEM, n=16)。運動處置於早上8-10點及傍晚4-6點之間走路15分鐘。按摩處置於晚上8-10點病人睡覺前使用背部按摩墊予背部按摩15分鐘。每日早上測量台灣版一般疲憊量表、維辛氏睡眠量表，第4天再加上醫院焦慮與憂鬱量表測量。結果: 治療前三組的病人均處於低疲憊 (TGFS score 22.8~30.6 ± 11.1~13.4)、中度睡眠品質(VSH score 81.1~103.2±20.4~24.3)、低焦慮與憂鬱 (HADS anxiety score 6.1~8.7±3.0~4.8, depression score 8.5~10.9±2.2~3.9)，且三組無差異。比較治療開始處置後之狀況，疲憊程度在按摩組與合併處治組筆運動組低 (MANOVA controlling for baseline data, F=2.59, p=.085)，運動組的憂鬱程度較處置前低(t=2.27, p=.034). 睡眠與焦慮程度則三組間無顯著差異。對頭頸部癌症病人進行化療治療期間，按摩可降低疲憊程度，運動可降低憂鬱程度，合併按摩與運動並無更多的效果。研究結果可提供處置癌症病人治療不適症狀的參考。

中 文 關 鍵 詞 ： 頭頸部癌症, 日夜節律, 睡眠, 疲憊, 情緒

英 文 摘 要 ： Keep a regular circadian rhythm may optimize anti-neoplastic effects and modulate our body systems. This study used a three-group, randomized controlled experimental design to examine the effects of circadian based interventions combined with exercise program (tailored walking at morning and evening) and massage therapy (by using massage cushion before bedtime) on sleep, mood, and fatigue in patients with head and neck cancer undergoing active chemo or radiotherapies. Fifty-two patients with head and neck cancer aged 52.5+-6.5 years were randomly allocated to exercise group (EG, n=21), massage group (MG, n=15) or combined exercise and massage group (CEM, n=16). Exercise was performed at 8-10 am and 14-16 pm for 15 minute for 3 consecutive days. Massage was performed by using a massage cushion before bedtime (20-22 pm) for 15 minutes for 3 consecutive evenings. The Taiwan general fatigue scale (TGFS), the Verramn & Snyder-

Halpen scale (VSH) and the Hospital Anxiety and Depression Scale (HADS) were administered to assess fatigue, sleep, and anxiety and depression, respectively, at baseline and the 4th day. Results: At baseline, all patients in three groups experienced low fatigue (TGFS score 22.8~30.6 ± 11.1~13.4), moderate sleep quality (VSH score 81.1~103.2±20.4~24.3), and low anxiety and depression (HADS anxiety score 6.1~8.7±3.0~4.8, depression score 8.5~10.9±2.2~3.9). No significant differences at baseline among these three groups. After intervention, Fatigue level was lowered in CME and MG groups (MANOVA controlling for baseline data, F=2.59, p=.085) compared to EG group. Depression score was decreased in EG group after treatment (t=2.27, p=.034). There were no significant differences in sleep quality or anxiety level after treatments. There is no additional effect in combining exercise and massage interventions.

英文關鍵詞：head and neck cancer, circadian rhythm, sleep, fatigue, mood

科技部補助專題研究計畫成果報告

（□期中進度報告/■期末報告）

計畫名稱:頭頸部癌症病人之疲憊與睡眠之日夜節律措施成效探討

計畫類別：■個別型計畫　□整合型計畫
計畫編號：NSC 102－2314 －B － 040 －003－
執行期間： 102 年 8 月 1 日至 104 年 7 月 31 日

執行機構及系所：中山醫學大學護理學系

計畫主持人：廖玟君
共同主持人：蔡秀婷
計畫參與人員：游馥蓮

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□執行國際合作與移地研究心得報告
■出席國際學術會議心得報告

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中　華　民　國 104 年 10 月 31 日

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請就研究內容與原計畫相符程度、達成預期目標情況、研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）、是否適合在學術期刊發表或申請專利、主要發現（簡要敘述成果是否有嚴重損及公共利益之發現）或其他有關價值等，作一綜合評估。

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■ 達成目標

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2. 研究成果在學術期刊發表或申請專利等情形：

論文：□已發表 □未發表之文稿 ■撰寫中 □無

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3. 請依學術成就、技術創新、社會影響等方面，評估研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性），如已有嚴重損及公共利益之發現，請簡述可能損及之相關程度（以 500 字為限）

頭頸癌病人於化學治療併/或放射治療期間的疲憊、睡眠品質及焦慮，經給予睡前背部按摩後疲憊的程度有下降趨勢，建議可於癌症病房設置按摩椅，睡前供有需要之病人使用。經鼓勵病人早上及傍晚運動後憂鬱程度有下降，建議可指導病人依病人狀況鼓勵早上及傍晚走路。

A circadian-based intervention on fatigue and sleep in head and neck cancer patients undergoing active treatments

Abstract

Keep a regular circadian rhythm may optimize anti-neoplastic effects and modulate our body systems. This study used a three-group, randomized controlled experimental design to examine the effects of circadian based interventions combined with exercise program (tailored walking at morning and evening) and massage therapy (by using massage cushion before bedtime) on sleep, mood, and fatigue in patients with head and neck cancer undergoing active chemo or radiotherapies. Fifty-two patients with head and neck cancer aged 52.5+-6.5 years were randomly allocated to exercise group (EG, n=21), massage group (MG, n=15) or combined exercise and massage group (CEM, n=16). Exercise was performed at 8-10 am and 14-16 pm for 15 minute for 3 consecutive days. Massage was performed by using a massage cushion before bedtime (20-22 pm) for 15 minutes for 3 consecutive evenings. The Taiwan general fatigue scale (TGFS), the Verramn & Snyder-Halpen scale (VSH) and the Hospital Anxiety and Depression Scale (HADS) were administered to assess fatigue, sleep, and anxiety and depression, respectively, at baseline and the 4th day. Results: At baseline, all patients in three groups experienced low fatigue (TGFS score 22.8~30.6 ± 11.1~13.4), moderate sleep quality (VSH score 81.1~103.2±20.4~24.3), and low anxiety and depression (HADS anxiety score 6.1~8.7± 3.0~4.8, depression score 8.5~10.9±2.2~3.9). No significant differences at baseline among these three groups. After intervention, Fatigue level was lowered in CME and MG groups (MANOVA controlling for baseline data, F=2.59, p=.085) compared to EG group. Depression score was decreased in EG group after treatment (t=2.27, p=.034). There were no significant differences in sleep quality or anxiety level after treatments. There is no additional effect in combining exercise and massage interventions.

Keywords: head and neck cancer, circadian rhythm, sleep, fatigue, mood

中文摘要

睡眠障礙與疲憊是癌症病人治療中或治療後最常見的問題，主要是由疾病本身或抗癌藥物所引起的。癌症病人之疲憊、睡眠障礙、與憂鬱三者之間共同的機轉在於發炎物質 cytokines 的釋出。此外，依照日夜節律的運行可降低抗癌藥物的副作用並維持身體功能在最佳運作狀態。本研究為三年期研究計畫，使用隨機分派實驗性研究設計，檢測合併運動(早上與傍晚散步)與按摩處置(睡前使用按摩墊)的日夜節律措施對頭頸部癌症病人進行化學治療或放射線治療期間之發炎物質 cytokines、自主神經功能、節律型態、睡眠、情緒、與疲憊之成效。研究個案從病房個案邀請而來，並隨機分成三組:運動組、按摩組、依日夜節律合併運動與按摩處置組。每一位研究個案依據其組別接受 3 天的處置。研究結果將比較治療措施前後之發炎物質 cytokines、自主神經功能、節律型態、睡眠、情緒、與疲憊之成效。52 位頭頸部癌症病人年齡 52.5+-6.5 歲隨機被分至運動組 (EG, n=21)、按摩組 (MG, n=15) 或運動與按摩合併處置組 (CEM, n=16)。運動處置於早上 8-10 點及傍晚 4-6 點之間走路 15 分鐘。按摩處置於晚上 8-10 點病人睡覺前使用背部按摩墊予背部按摩 15 分鐘。每日早上測量台灣版一般疲憊量表、維辛氏睡眠量表，第 4 天再加上醫院焦慮與憂鬱量表測量。結果: 治療前三組的病人均處於低疲憊 (TGFS score 22.8~30.6 ± 11.1~13.4)、中度睡眠品質(VSH score 81.1~103.2±20.4~24.3)、低焦慮與憂鬱 (HADS anxiety score 6.1~8.7±3.0~4.8, depression score 8.5~10.9±2.2~3.9)，且三組無差異。比較治療開始處置後之狀況，疲憊程度在按摩組與合併處置組較運動組低 (MANOVA controlling for baseline data, F=2.59, p=.085)，運動組的憂鬱程度較處置前低(t=2.27, p=.034). 睡眠與焦慮程度則三組間無顯著差異。對頭頸部癌症病人進行化療治療期間，按摩可降低疲憊程度，運動可降低憂鬱程度，合併按摩與運動並無更多的效果。研究結果可提供處置癌症病人治療不適症狀的參考。

關鍵字: 頭頸部癌症, 日夜節律, 睡眠, 疲憊, 情緒

Introduction

Sleep disturbance and fatigue are the most common and significant problems in oncology patients during and after treatment [1-4]. As patients receive cancer therapies to eliminate the malignancy or to control tumor growth, issues related to longer-term quality of life and sense of well-being are emerged. Fatigue is reported by 80% of cancer patients undergoing chemotherapy and/or radiotherapy [4] and 30%~50% of cancer patients experienced sleep disturbances before, during, and after therapy [5,6]. These symptoms have negative impact on their functional status and quality of life [7-9]. Find a way to manage sleep disturbance and fatigue may improve their functional status hence promote their quality of life.

Causes of sleep disturbance and fatigue in cancer patients are associated with disease itself and with the antineoplastic treatment. Due to the co-occurrence of fatigue, sleep disturbance, and depression in cancer patients, many studies suggest these symptoms may share a common underlying mechanism driven by the activation of the proinflammatory cytokines [2,10,11]. Fatigue and sleep symptoms are associated with inflammation. Many studies also suggest that exercise has effect on anti-inflammation to ameliorate fatigue and depression [12,13] as well as on activation of ANS function in enhancing vagal modulation of parasympathetic control to improve sleep and mood [14]. Massage can alleviate symptoms of pain, nausea, anxiety, depression, anger, stress and fatigue in patients with various type of cancer receiving treatment [15] or in people with depression [16] through comforting and relaxing our body. Moreover, circadian timing play roles to optimize anti-neoplastic effects and minimize toxicity to normal cell during therapy [17] as well as regulating our body systems. Therefore, a circadian based intervention combined with exercise and massage therapies may be more efficient to alleviate sleep disturbance and fatigue in cancer patients. This study will examine the effects of a circadian based exercise program (tailored walking at morning and at evening) and massage therapy (by using massage cushion before bedtime) on inflammatory cytokines, autonomic nervous function, circadian pattern, sleep, mood, and fatigue in patients with head and neck cancer undergoing active chemo or radiotherapies.

Specific aims

The specific aims of this study are to examine and compare the effects of circadian-based exercise and massage interventions on:

1. Inflammatory cytokines of IL-1, IL-6, IL-10, and Tissue Necrosis Factor- alpha (TNF-α)
2. Autonomic nervous function- Heart rate variability (HRV) of parasympathetic modulation (HF power),

sympathetic modulation (LF power), and sympathovagal balance (LF/HF power of R-R variability).

3. Circadian sleep-wake pattern through actigraphy
4. Mood includes depression and anxiety.
5. Sleep pattern and sleep quality.
6. Fatigue.

Theoretic Framework for this study

A circadian-based program combining exercise and massage therapy is developed in this study to ameliorate fatigue, improve sleep and depressive mood in cancer patients during active treatment. The theoretical framework is shown in Figure 1. Exercise is performing at morning to wake up the body, and also performing at evening, the acrophase (peak) of a day, to get more physical stress to the body and increase the amplitude of circadian rhythm. Performing exercise during daytime also has effect on anti-inflammation to the body to ameliorate inflammation induced by tumor or treatment. Massage therapy is performing before bedtime to smooth over the tension of the body and get ready to resign. This circadian-based program may have effects on sleep, mood, and fatigue in cancer patients undergoing treatment.

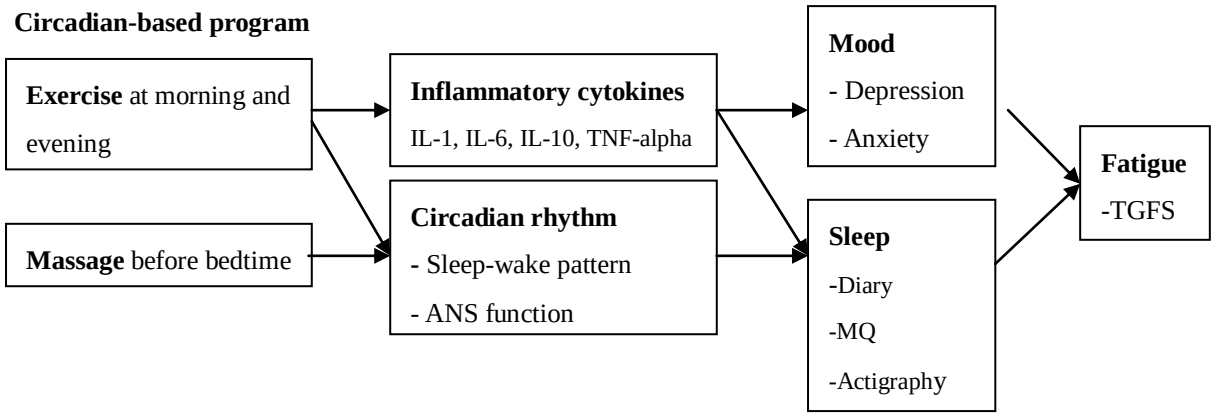

Figure 1. Theoretical framework for this study.

Methods

Study Design and procedure

Three groups, randomized controlled experimental design, was used to examine the effects of a circadian based program combined with exercise and massage therapy on autonomic nervous function, inflammatory cytokines, sleep, mood, and fatigue in cancer patients during active treatment. Head and neck cancer patients undergoing active chemotherapy or radiotherapy was recruited from hospitalization and randomly assigned to three groups: the exercise only group (EX), the massage only group (MS), and the circadian-based exercise

plus massage group (CEM). Each subject received a 3-day intervention according to their groups.

Exercise (EX) group: Subjects in the EX group will perform moderate intensity exercise both at morning and at evening the day before treatment starts for 3 days. Walking is the main exercise activity. Based on individual tolerance, participants can walk by their speed for 10-30 minutes. Participants was advised to respect their own physical limitation.

Massage (MS) group: Subjects in the MS group will get 15 min of massage from massage cushion before bedtime the day before treatment starts for 3 days.

CME group: Subjects in the CME group will have morning and evening exercise alone with bedtime massage from massage cushion the day before treatment starts for 3 days. Exercise activity is same as the EX group.

Outcomes of inflammatory cytokines, ANS function of heart rate variability (HRV), sleep quality, and fatigue will be compared before and after intervention among groups. Study procedures are graphically summarized in Figure 2.

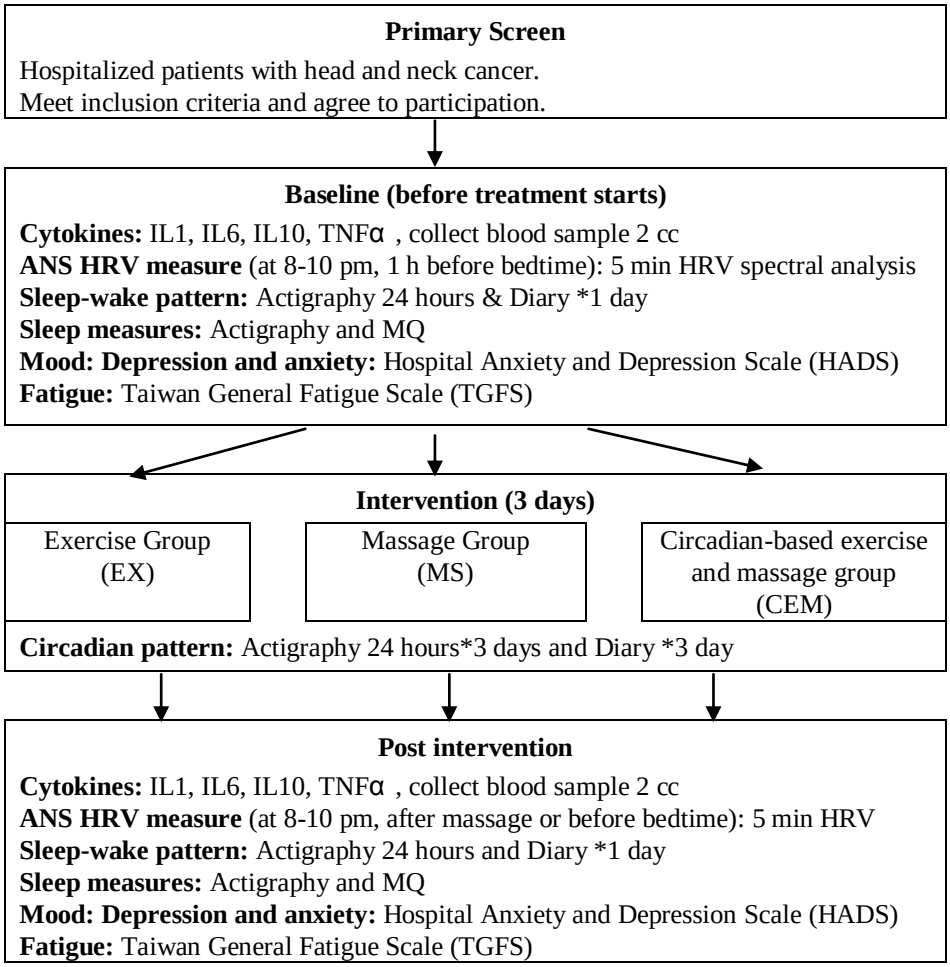

Figure 25. Study procedures

Subjects

Patients meet the following criteria are invited to participate in this study:

Inclusion criteria:

1. Adult patients aged 20 years and over, male or female.
2. Diagnosed with head and neck cancer under active chemotherapy or/and radiotherapy

3. No major mental disorders such as schizophrenia, MDP.
4. No cognitive impairment (MMSE > 25 in those with middle to high educational level, >19 in those with low education or illiterate).
5. Low risk in falls assessment (<8).
6. Agree and be able to answer questions in oral or in writing.

Exclusion criteria:

Subjects would be excluded from the study if they had

1: Brain or bone metastasis
2. Platelets < 50000
3. Acute cardiovascular disease, systematic disease such as diabetes and hypertension
4. Cognitive impairment
5. High risk in falls assessment (>=8).

Sample

Sixty six patients were recruited from oncology wards of medical centers in central Taiwan. Among them, 13 refused, 1 withdrew, 52 patients completed this study and were randomly assigned to the EG group (n=21), MG group (n=15) and CMG group (n=16).

Outcome Measures

Inflammatory cytokines, autonomic nervous function, circadian pattern, sleep, mood, and fatigue will be measured at baseline and after intervention. Demographic data will be collected as well.

Inflammatory cytokines

Cytokine concentrations of IL-1, IL-6, IL-10 and TNF-a were measured in the plasma using the human cytokine LINCO-plex multiplex bead array (Linco Research, St. Charles, MO, USA). In brief, the antibody specific to each cytokine is covalently coupled to Luminex microspheres, with each antibody coupled to a different microsphere uniquely labeled with a fluorescent dye. The microspheres are incubated with standards, controls and samples in a 96-well microtiter filter plate for 1 h at room temperature. After washing with assay wash buffer, diluted biotinylated secondary antibody was added to the appropriate wells and incubated for 1 h. After washing, streptavidin-phycoerythrin was added to each well and incubated for 30 min. After a final wash, the plate was analyzed using the Luminex 100 analyzer (Luminex Corp., Austin, TX, USA) to determine the concentration of the cytokines. 2 cc of blood sample will be collected from each participants before and after interventioin.

Circadian rhythm

1. Autonomic nervous function heart rate variability (HRV)

The frequency of electrical discharge by sinus node is controlled by the autonomic nervous system. Heart rate variability (HRV) is sensitive to the activity of autonomic nervous system (ANS). HRV has become a popular noninvasive approach to measure ANS function. It records and analyzes the beat to beat variation (R-R) of heart rate on the cardiac electrical signal. A 5-min measure of heart rate provides a good estimate of parasympathetic nervous system activity [18]. This frequency domain analysis, or spectral analysis, provides information of how the variance (power) of heart signals are distributed into different frequency components. There are two major spectral components in HRV data: high frequency (HF) component and low frequency (LF) component. The HF component, usually from 0.15 to 0.40 Hz, is considered to reflect para-sympathetic nervous system activity. The LF component, usually from 0.04 to 0.15 Hz, is related to a combined effect of sympathetic and parasympathetic activity. The ratio of LF component to HF component is the balance between sympathetic and parasympathetic activities [18-20].

HRV will be measured at 8-10 pm after massage therapy or 1 hours before bedtime at baseline and after intervention. Subjects will lay down and take a rest for 10min and start to record 5-min lead II ECG. Data will be converted to computer and analyzed by the HRV software. Parameters of the mean and standard deviation of heart rate, total power, LF component, HF component, and LF/HF ratio will be calculated.

2. Sleep-wake pattern

SOMNOwatch (SOMNO medics, Germany), a watch-like device for measuring wrist activity, will be used for this study. SOMNOwatch detects body motion and activity level to an actigraphy to estimate sleep or wake state. Since it employs a small-size, light-weight, and portable recorder, SOMNOwatch is well tolerable and is able to record activity level every second to every minute for couple days without laboratory confinement.

SOMNOwatch is a non-invasive, least bothering measure for observing more than 24-hour sleep-wake pattern and sleep quality. Participants will wear it 24 hours continuously at baseline and 3 days during intervention and also keep sleep diary for reference of activity. Activity level will be detected and recorded every 30 seconds. Raw activity data will be downloaded to computer for display, analysis and interpretation by using the Actiware software.

<u>Sleep measures</u>

Sleep measures include actigraphy for sleep pattern and the diary for perceived sleep quality. Actigraphy will be measured 24 hours at baseline and 3 days during and after intervention. Diary is recorded every day.

1. Actigraphy

Nighttime actigraphy monitored by the SOMNOwatch will be used to estimate sleep latency, sleep duration, sleep efficiency, and awakening. A correlation of 0.73 ~ 0.8 between actigraphy estimated and polysomnography sleep in patients with sleep disorder was reported (Kushida et al., 2001), which indicated an acceptable validity.

2. Dairy

The diary contains two parts: bedtime and wake time questions. The bedtime questions include: a) consumption of caffeine, alcohol, and tobacco products; b) medication use; c) habitual activities before getting into sleep; d) light during sleep; e) sleep partners, if any; f) environmental noise during bedtime; and g) the timing and duration of exercise and nap periods. The wake time questions gather information about: a) bedtime; b) sleep latency; c) final wake time; d) frequency of nocturnal awakenings; d) minutes of wake after sleep onset; e) reasons for nocturnal awakenings; f) mood on final awakening; g) alertness on final awakening; h) sleep quality and satisfaction. The estimate time spending to complete the diary will be 10 minutes per day.

Mood

Anxiety and depression: The Hospital Anxiety and Depression Scale (HADS) [21] will be used to assess patients' anxiety and depression. The HADS contains 7 items of anxiety and 7 items of depression subscales with a score of 0 (not at all) to 3 (Most of the time) for each question. The two subscales are aggregated to overall anxiety and overall depression scores with a total of 21, respectively. A subscale score of 7 and below is interpreted as normal, 8-10 indicates a doubtful case. The HADS is originated from UK and is available in all languages including Chinese. The reliability and validity of the HADS Chinese version are well documented in Taiwan's populations [22,23].

Fatigue

Cancer-related fatigue will be measured by the General Fatigue Scale (GFS) [24]. It consists 7 self-administered descriptors regarding patient's fatigue level in the past week, now, and majority etc. with 1="no fatigue" to 10="severely fatigue". The higher score is associated with higher fatigue with a total score of 7-70. The Cronbach's alpha for the Chinese version of the GFS was .95 in head and neck patients.

Demographic data

Age, gender, education, marriage, occupation, religion, health history, exercise and sleep habits, and medications will be collected. History in cancer and therapies they have experienced will be reviewed as well.

Data analysis

Descriptive statistics including frequency, percentage, range, mean, and standard deviation will be used to understand sample distributions of inflammatory cytokines, ANS-HRV parameters, circadian pattern, actigraphy sleep parameters, perceived sleep quality indicators, mood, and fatigue. Data will be transformed if necessary. Inferential statistics including paired t-test, repeated measure ANOVA or appropriate nonparametric equivalent will be used to compare pre-post differences and to compare differences among groups. Significance level was set at $p < .05$, one tailed. Definitions of outcome variables (Table 1) is summarized below.

Table 1. Definitions of outcome variables

Concepts	Variables	Definitions
Inflammatory cytokines	IL1, IL6, IL10, TNFα	Extract from serum to reflect the level of inflammation in body
ANS-HRV	Total power	Area under power spectral density curve
	LF	Power in low frequency band (0.04 to 0.15 Hz) reflects both sympathetic and parasympathetic nerve activities
	HF	Power in high frequency band (0.15 to 0.40 Hz) reflects parasympathetic nerve activity
	LF/ HF	Ration of LF power to HF power infers the balance between sympathetic and parasympathetic activities
Circadian pattern	Sleep-wake pattern	Minutes of wake and sleep and fragmentation index during daytime and nighttime.
Sleep patterns	ACT SL	Actigraphy sleep latency. The time takes for falling asleep, which is the period from light out to the onset of actigraphy sleep.
	ACT WASO	Wake after sleep onset. The total minutes of the awake within the sleep period in actigraphy.
	ACT SE	Actigraphy sleep efficiency. The ratio of actigraphy total sleep time to total time in bed.
Perceived sleep quality	Overall sleep quality	Overall sleep quality in last night
	Sleep satisfaction	Overall sleep satisfaction in last night
Mood	Depression	Overall score
	Anxiety	Overall score
Fatigue	General Fatigue Scale	FGS score

Results

Personal Characteristics

Table 1. Personal charaacteristics(N=52)

		EG N=21(%)	MG N=15(%)	CMG N=16(%)	N=52(%)	p
Gender						
	Male	19(90.5)	13(86.7)	16(100)	48(92.3)	0.35
	Female	2(9.5)	2(13.3)	0(0)	4(7.7)	
Age		56.10±5.86	53.53±9.27	50.63±7.02	53.67±7.54	0.26
Education						
	不識字	0(0)	1(6.7)	0	1(1.9)	0.41
	小學	9(42.9)	5(33.3)	1(6.3)	15(28.8)	
	國中	3(14.3)	4(26.7)	4(25.0)	11(21.2)	

	高中	5(23.8)	5(33.3)	7(32.7)	17(32.7)	
	大學(專科)	4(19.0)	0(0.0)	4(25.0)	8(15.4)	
Occupation						
	有	8(38.1)	5(33.3)	6(37.5)	19(36.5)	0.95
	無	13(61.9)	10(66.7)	10(62.5)	33(63.5)	
Diagnose						
	鼻咽癌	8(38.0)	5(33.3)	5(31.3)	18(34.6)	0.72
	口腔癌	7(33.3)	5(33.3)	4(25.0)	16(30.8)	
	喉癌	1(4.8)	0(0.0)	0(0.0)	1(1.9)	
	下咽癌	4(19.1)	2(13.3)	2(12.5)	8(15.4)	
	口咽癌	0(0.0)	0(0.0)	1(6.2)	1(1.9)	
	扁桃腺癌	0(0.0)	2(13.3)	2(12.5)	4(7.7)	
	其它	1(4.8)	1(6.8)	2(12.5)	4(7.7)	
Cancer stage						0.08
	Ⅰ	0(0.0)	3(20.0)	0(0.0)	3(5.8)	
	Ⅱ	4(19.0)	1(6.7)	3(18.8)	8(15.4)	
	Ⅲ	5(23.8)	6(40.0)	3(18.8)	14(26.9)	
	Ⅳ	12(57.1)	5(33.3)	10(62.5)	27(51.9)	
Treatment						
	化學治療	16(76.2)	12(80.0)	11(68.8)	39(75.0)	0.76
	化學治療併放射治療	5(23.8)	3(20.0)	5(31.3)	13(25.0)	
Times of C/T		2.57±0.38	3.07±0.50	1.50±0.16	2.38±1.65	0.98
Hb		13.11±1.69	10.93±1.96	12.14±2.37	12.19±2.16	0.44

Fatigue, sleep quality, anxiety, and depression

Tables 2-5 shows the results of comparing fatigue, sleep quality, anxiety, and depression in three groups after exercise, massage, and exercise massage combined programs.

Table 2. Comparing Fatigue level in 3 groups after treatment (Repeated measurement、ANOVA)

	運動組			按摩組			實驗組				
	平均值±標準差	F^1	*p*	平均值±標準差	F^1	*p*	平均值±標準差	F^1	*p*	F^2	*p*
治療前	22.8±13.3	2.361	0.080	30.6 ±11.1	0.664	0.579	28.3 ±13.4	1.153	0.338	0.653	0.525
第一天治療	26.8±11.3			30.6 ±10.4			26.9±10.7				
第二次治療	29.2±12.9			29.8±10.1			25.9±9.9				
第三次治療	26.6±14.1			27.6±9.0			23.1±10.6				
與治療前之差異											
第一天治療	4.0±10.0	1.219	0.304	0.2±11.3	2.733	0.075	-1.4±11.4	2.472	0.095	2.592	0.085
第二次治療	6.3±13.5			-1.2 ±10.3			-2.4±12.9				
第三次治療	3.8 ±13.4			-3.1±11.5			-5.3±13.7				

註：F^1：以 ANOVA 檢定各組內疲憊分數(或與前測分數之差異)隨著時間變化是否有顯著

F^2：以 Repeated measurement 檢定各組間疲憊分數(或與前測分數之差異)隨著時間變化是否有顯著

Table 3. Comparing Sleep quality in 3 groups after treatment(Repeated measurement、ANOVA)

	運動組			按摩組			實驗組				
	平均值±標準差	F^1	*p*	平均值±標準差	F^1	*p*	平均值±標準差	F^1	*p*	F^2	*p*
治療前	103.2 ±21.2	1.021	0.369	81.1±20.4	2.228	0.100	90.6 ±24.3	0.954	0.396	2.902	0.065
第一天治療	97.6 ±17.9			78.7±29.8			85.4±18.6				
第二次治療	95.4 ±21.6			89.7 ±19.6			85.93±20.1				
第三次治療	95.7±20.9			90.0 ±18.1			91.31±21.9				
與治療前之差異											
第一天治療	-5.6 ±19.5	0.293	0.748	-0.6±23.6	2.758	0.073	-5.2 ±19.6	1.790	0.178	2.283	0.113
第二次治療	-7.8±26.9			10.8±20.6			-4.7 8±23.917				
第三次治療	-7.6±26.1			9.0±19.1			0.71±20.3				

註：F^1：以 ANOVA 檢定各組內睡眠分數(或與前測分數之差異)隨著時間變化是否有顯著

F^2：以 Repeated measurement 檢定各組間睡眠分數(或與前測分數之差異)隨著時間變化是否有顯著

Table 4, Comparing Anxiety in 3 groups after treatment (Paired T Test、ANOVA)

	運動組			按摩組			實驗組				
	平均值±標準差	t^1	*p*	平均值±標準差	t^1	*p*	平均值±標準差	t^1	*p*	F^1	*p*
前測	7.1±4.8	1.563	0.134	8.7 ±4.7	1.498	0.158	6.1 ±3.0	1.392	0.184	0.09	0.91
後測	6.0±3.5			7.3±3.8			5.2±2.3				
與治療之差異										1.55	0.92
完成治療後測	-1.1 ±3.4	1.563	0.134	-1.4 ±3.6	1.498	0.158	-0.9 ±2.7	1.392	0.184		

註：t^1：以 Paired T Test 檢定各組內焦慮分數(或與前測分數之差異)隨著時間變化是否有顯著

F^1：以 Repeated measurement 檢定各組間焦慮分數(或與前測分數之差異)隨著時間變化是否有顯著

Table 5. Comparing Depression in 3 groups after treatment(Paired T Test、ANOVA)

	運動組			按摩組			實驗組				
	平均值±標準差	t^1	*p*	平均值±標準差	t^1	*p*	平均值±標準差	t^1	*p*	F^1	*p*
前測	8.5±3.9	2.274	0.034	10.9 ±3.0	-.073	0.943	10.1 ±2.2	1.678	0.114	4.31	0.43
後測	7.1 ±3.4			11.0 ±2.5			9.2±2.4				
與治療之差異										1.07	0.35
完成治療後測	-1.4±2.8	2.274	0.034	0.1±3.6	-.073	0.943	-0.9 ±2.2	1.678	0.114		

註：t^1：以 Paired T Test 檢定各組內憂鬱分數(或與前測分數之差異)隨著時間變化是否有顯著

F^1：以 Repeated measurement 檢定各組間憂鬱分數(或與前測分數之差異)隨著時間變化是否有顯著

Relationships among fatigue, sleep quality, depression, and anxiety

Table 6. Correlation between fatigue, sleep quality, anxiety, and depression after treatment

	TGFS		VSH		HADS-A	
	r	p	r	p	r	p
VSH	-0.114	0.427				
HADS-A	0.191	0.179	-0.464**	0.001		
HADS-D	-0.270	0.056	-0.321*	0.022	0.459**	0.001

Table 7. Fatigue and sleep quality in Regression analysis

	VSH1		TGFS2		VSH2		TGFS3		VSH3	
	Beta	p	Beta	p	Beta	p	Beta	p	Beta	p
TGFS1	-0.512	0.000								
VSH1			-0.267	0.055						
TGFS2					-0.315	0.023				
VSH2							-0.143	0.313		
TGFS3									-0.422	0.002

註：以台灣版一般疲憊量表(TGFS)測得病人疲憊分數；以維辛氏睡眠量表(VSH)測得病人睡眠品質分數；以醫院焦慮與憂鬱量表測得焦慮與憂鬱分數

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科技部補助專題研究計畫出席國際學術會議心得報告

日期：104 年 10 月 31 日

計畫編號	NSC 102－2314 －B － 040 －003		
計畫名稱	頭頸部癌症病人之疲憊與睡眠之日夜節律措施成效探討		
出國人員姓名	廖玟君	服務機構及職稱	中山醫學大學護理學系
會議日期	104/5/31~104/06/4	會議地點	美國明尼亞波里
會議名稱	The 28th annual meeting of the American Professional Sleep Society (2014 APSS)		
發表論文題目	Diabetes Control on Sleep in Patients with Type 2 Diabetes		

心　　得　　報　　告

與會心得:

美國睡眠醫學研究學會(The American Professional Sleep Society)每年舉行大會一次,為全球最大且最重要的睡眠醫學研究發展會議，本年度在明尼亞波里舉行第 28 屆大會。一如往例，會中有各領域專家學者提出自己領域裡睡眠相關的議題，並與其他領域的專家學者交流。我針對我有興趣的議題包括糖尿病/代謝症候群與睡眠、輪班、失眠等議題與會，新的研究顯示睡眠時間長短是一個問題，但何時睡也是個問題。同樣時間的睡眠，吃同樣熱量的食物，但如果是熬夜時的進食，食物在體內的代謝會傾向於節能模式，因此熬夜除了有可能因工作而吃更多食物外，身體也會減緩代謝速率儲存較多的能量，即使吃同樣的食物還是會發胖。這些研究都告訴我們規律作息的重要。此外，燈光與睡眠也是我關注的議題，藍光對睡眠與情緒的影響開始受到注意白天的藍光/白光可以促進工作效率，改善憂鬱，夜晚的藍光則會延遲身體週期，而睡眠時則更需避免所有的燈光，燈光是需要視時間而調整的。此行收穫豐富，對未來的研究促進人類睡眠健康有更廣闊與深入的認識。

論文摘要:

Introduction: Sleep is an important indicator for quality of life. Patients with diabetes often have sleep disorders, especially symptoms of insomnia or sleep apnea. Status of diabetes control may contribute to sleep disorders. This study used a longitudinal design to explore the role diabetes control plays in sleep quality. Patients with type 2 diabetes mellitus were recruited from a pool of the Diabetes Care Network (DCN) in endocrine outpatient clinics of a medical center. Methods: Two hundred and seventy-five patients (124 males and 151 females) aged 33-86 years (mean ± SD = 61.8±10.4) in the DCN were sampled and their diabetes control were retrospectively retrieved from medical records for

1 year. The Pittsburg Sleep Quality Index (PSQI >=5) and the Epworth Sleepiness Scale (ESS>=10) were used to assess sleep quality and excessive daytime sleep. Statistic software of SPSS AMOS 17.0 was used for data analyses. Results: 76.7% of patients had poor glycemic control (HbA_{1c} >7) with a mean of 8.2±1.7. The majority of participants slept 6-7 hours (35.8%) and 55.8% were classified as having poor quality of sleep. In contrast, only 33.2% claimed having more than 7 hours of sleep a night, and 24.6% were classified as having excessive daytime sleep. The leading causes to disturb night time sleep perceived by current participants were nocturia (53.5%), can't get to sleep within 30 minutes (28.4%), and wake up in the middle of night (21.2%). After controlling for age and gender, patients with poor lipid control had higher risk (OR=2.696, p=.025) of poor sleep; patients with poor glycemic control had more excessive daytime sleep (B=1.369, p=.033). Conclusion: Nocturia is the most bothersome symptom during nighttime sleep. Poor lipid and glycemic control is associated with sleep quality and excessive daytime sleep. Findings from this study provide information about the control and severity of type 2 diabetes on sleep.

This study was supported by the Taiwan National Science Council NSC 100-2314-B040-002 and Chun Shan Medical University CSH 2012-A-002.

建議:

國內學者多出國發表相關論文資料，增加台灣睡眠研究之國際曝光度。在這十數年的努力之下，睡眠研究有長足的發展，也發現睡眠對人的影響真是無遠弗屆，睡眠會議提供相關領域人員一個很重要的交流園地，我想未來我仍會繼續參加下去。而在研究過程中形成跨領域的睡眠研究團隊，不管對研究發展或是對臨床照顧都是非常有用的。

科技部補助計畫衍生研發成果推廣資料表

日期:2015/11/05

科技部補助計畫	計畫名稱: 頭頸部癌症病人之疲憊與睡眠之日夜節律措施成效探討
	計畫主持人: 廖玟君
	計畫編號: 102-2314-B-040-003- 學門領域: 基礎護理學

無研發成果推廣資料

102年度專題研究計畫研究成果彙整表

計畫主持人：廖玟君	**計畫編號：**102-2314-B-040-003-
計畫名稱：頭頸部癌症病人之疲憊與睡眠之日夜節律措施成效探討	

成果項目			量化			單位	備註（質化說明：如數個計畫共同成果、成果列為該期刊之封面故事...等）
			實際已達成數（被接受或已發表）	預期總達成數（含實際已達成數）	本計畫實際貢獻百分比		
國內	論文著作	期刊論文	0	1	100%	篇	無
		研究報告/技術報告	0	0	100%		無
		研討會論文	2	2	100%		無
		專書	0	0	100%	章/本	無
	專利	申請中件數	0	0	100%	件	無
		已獲得件數	0	0	100%		無
	技術移轉	件數	0	0	100%	件	無
		權利金	0	0	100%	千元	無
	參與計畫人力（本國籍）	碩士生	1	1	100%	人次	無
		博士生	0	0	100%		無
		博士後研究員	0	0	100%		無
		專任助理	0	0	100%		無
國外	論文著作	期刊論文	0	1	100%	篇	無
		研究報告/技術報告	0	0	100%		無
		研討會論文	0	1	100%		無
		專書	0	0	100%	章/本	無
	專利	申請中件數	0	0	100%	件	無
		已獲得件數	0	0	100%		無
	技術移轉	件數	0	0	100%	件	無
		權利金	0	0	100%	千元	無
	參與計畫人力（外國籍）	碩士生	0	0	100%	人次	無
		博士生	0	0	100%		無
		博士後研究員	0	0	100%		無
		專任助理	0	0	100%		無
其他成果（無法以量化表達之成果如辦理學術活動、獲得獎項、重要國際合作、研究成果國際影響力及其他協助產業技術發展之具體效益事項等，請以文字敘述填列。）		無					

	成果項目	量化	名稱或內容性質簡述
科教處計畫加填項目	測驗工具(含質性與量性)	0	
	課程/模組	0	
	電腦及網路系統或工具	0	
	教材	0	
	舉辦之活動/競賽	0	
	研討會/工作坊	0	
	電子報、網站	0	
	計畫成果推廣之參與（閱聽）人數	0	

科技部補助專題研究計畫成果報告自評表

請就研究內容與原計畫相符程度、達成預期目標情況、研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）、是否適合在學術期刊發表或申請專利、主要發現或其他有關價值等，作一綜合評估。

1. 請就研究內容與原計畫相符程度、達成預期目標情況作一綜合評估
   ■達成目標
   □未達成目標（請說明，以100字為限）
   　□實驗失敗
   　□因故實驗中斷
   　□其他原因
   說明：

2. 研究成果在學術期刊發表或申請專利等情形：
   論文：□已發表 □未發表之文稿 ■撰寫中 □無
   專利：□已獲得 □申請中 ■無
   技轉：□已技轉 □洽談中 ■無
   其他：（以100字為限）
   2015台灣護理學會論文發表

3. 請依學術成就、技術創新、社會影響等方面，評估研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）（以500字為限）
   頭頸癌病人於化學治療併/或放射治療期間的疲憊、睡眠品質及焦慮，經給予睡前背部按摩後疲憊的程度有下降趨勢，建議可於癌症病房設置按摩椅，睡前供有需要之病人使用。經鼓勵病人早上及傍晚運動後憂鬱程度有下降，建議可指導病人依病人狀況鼓勵早上及傍晚走路。