The Efficacy of Home-Based Walking Exercise on Sleep in Cancer Survivors: A Meta-Analysis of Randomized Controlled Trials

Hsiao-Yean Chiu, RN, PhD[1], Pei-Shan Tsai, RN, PhD[1], Pin-Yuan Chen, MD, PhD[2]

[1]Graduate Institute of Nursing, Taipei Medical University, Taipei, Taiwan
[2]Department of Neurosurgery, Chang Gung Memorial Hospital, Taoyuan, Taiwan

Background

Disturbed sleep is common among cancer patients. Previous studies have reported conflicting findings with regard to the effects of walking exercise on sleep among cancer patients and survivors.

Purpose

To examine the effects of home-based walking exercise on sleep in cancer patients and survivors by conducting a meta-analysis of randomized controlled trials (RCTs).

Methods

- We searched the EMBASE, PubMed, PsychINFO, Web of Science, and CINAHL electronic databases.
- Only RCTs that examined the effects of walking exercise on sleep in cancer patients and cancer survivors relative to a control group were included.
- The data were analyzed using the Comprehensive Meta Analysis software 2.0.
- The moderator analysis and meta regression were used to examine moderating effects while the heterogeneity exist among the included studies..
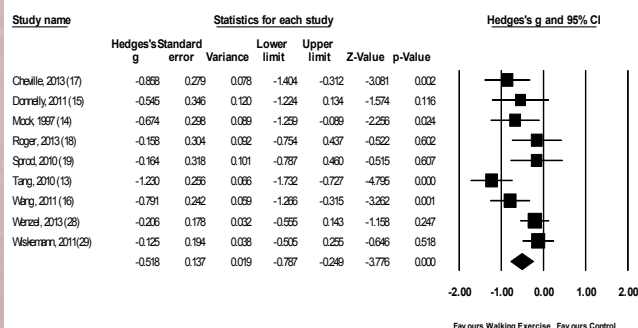
Results

- Nine RCTs that included 599 patients were selected.
- Moderate-intensity home-based walking exercise yielded an effect size of -0.52 (95% CI = - 0.79 to -0.25).
- Home-based walking exercise alone and walking exercise combined with other form of exercise yield comparable effects on sleep improvement (P = 0.22).
- The effect size of studies including participants who were undergoing cancer treatment and that of studies including patients before, during, or after cancer treatments were similar (P = 0.94).
- The moderating effects of intervention components, methodological features and subject characteristics on the relationship between MBIs and sleep were not found (all P>.05).

Table 1. Patient demographics at baseline and study characteristics (N = 599)

Characteristics		
Sample size, N (%)		
Intervention group	301	(50.3)
Control group	298	(49.7)
Age, Mean (SD)	54.39	(5.74)
Women, N (%)	388	(64.77)
Type of cancer		
Breast cancer	253	(42.24)
Others [a]	346	(57.76)
Sleep as primary outcome, N (%)		
Yes	3	(33.33)
No	6	(66.67)
The period of cancer treatment at enrollment, N (%)		
Before, during, after	4	(44.44)
During	5	(55.56)
Use of intention to treat analysis, N (%)		
Yes	7	(77.78)
No	2	(22.22)
Outcome measurement, N (%)		
PSQI	5	(55.56)
Symptom Numeric rating	2	(22.22)
PROMIS	1	(11.11)
EORTC- QLQ C30	1	(11.11)

[a]= Neoplastic hematologic disorders, colorectal, prostate, lung, gynaecological, gastrointestinal, nasopharyngeal, and other cancer. PSQI= Pittsburgh Sleep Quality Index; PROMIS= Patient reported outcomes measurement information system; EORTC- QLQ C30 = the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire.

Study name	Hedges's g	Standard error	Variance	Lower limit	Upper limit	Z-Value	p-Value
Cheville, 2013 (17)	-0.858	0.279	0.078	-1.404	-0.312	-3.081	0.002
Donnelly, 2011 (15)	-0.545	0.346	0.120	-1.224	0.134	-1.574	0.116
Mock, 1997 (14)	-0.674	0.298	0.089	-1.259	-0.089	-2.256	0.024
Roger, 2013 (18)	-0.158	0.304	0.092	-0.754	0.437	-0.522	0.602
Sprod, 2010 (19)	-0.164	0.318	0.101	-0.787	0.460	-0.515	0.607
Tang, 2010 (13)	-1.230	0.256	0.066	-1.732	-0.727	-4.795	0.000
Wang, 2011 (16)	-0.791	0.242	0.059	-1.266	-0.315	-3.282	0.001
Wenzel, 2013 (28)	-0.206	0.178	0.032	-0.555	0.143	-1.158	0.247
Wiskemann, 2011 (29)	-0.125	0.194	0.038	-0.505	0.255	-0.646	0.518
	-0.518	0.137	0.019	-0.787	-0.249	-3.776	0.000

Hedges's g and 95% CI — Favours Walking Exercise / Favours Control

Meta Analysis

Conclusion

Moderate-intensity home-based walking exercise is effective for reducing sleep disturbance in cancer patients and survivors. Our findings support the inclusion of walking exercise in multimodal approaches to managing sleep in cancer patients.