

## Sigma's 30th International Nursing Research Congress

### Meta-Analysis: Exercise Intervention for Sleep Problems in Cancer Patients

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**Purpose:** This study aimed to explore the efficacy of exercise intervention to improve sleep in cancer patients.

**Methods:** Published papers from 1980 to 2018 were searched in PubMed, Embase, PsycINFO, and the Chinese database Airti Library. We found 2,226 articles using predetermined keywords and Jadad's criteria to appraise their quality. Additionally, we applied the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol to ensure the rigor of this review. Comprehensive Meta-Analysis (CMA) was used to calculate the pooled means of total subjective sleep quality (TSSQ) and objective sleep quality. After calculating effect size of each study, we performed subgroup analyses, such as cancer type, treatment status, exercise programs (intervention design, exercise types, and intervention duration and weekly volume), to determine the variance of the intervention effect on different patient characteristics in this meta-analysis.

**Results:** Twenty-two studies were analyzed in the meta-analysis. Of the 1,833 cancer patients, 1,324 were women, and 509 were men (study sample sizes ranged from 19 to 277), and the majority of cancer patients were breast cancer and hematologic malignancies patients. The major findings included (1) exercise intervention had small positive effects on enhancing TSSQ ( $g = .38$ , 95% CI= .21 to .54) and objective sleep onset latency ( $g = .21$ , 95% CI= .01 to .41). (2) The characteristics in subgroups regarding the small to large effects of an exercise program on sleep were identified. First, the groups of a home-based exercise and a supervised exercise combined with a home-based exercise had a medium effect on TSSQ than the usual group. Second, interventions with aerobic exercise, especially the 4 to 8-week programs and those with weekly volume of 80 to 149 minutes per week for cancer patients with ongoing or completed treatment also had a medium to large positive effect on TSSQ. Finally, patients with breast cancer and hematologic malignancies contributed a small effect in this meta-analysis.

**Conclusion:** Our study support that exercise intervention, especially aerobic exercise, has a positive effect on TSSQ and objective sleep onset latency in cancer patients. The main suggestions are that aerobic exercise programs of four to eight weeks and weekly volume between 80 and 149 minutes per week can contribute a medium to large positive effect on sleep in patients during or after the anticancer treatment period.

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**Title:**

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**Keywords:**

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### **Abstract Summary:**

Home-based and supervised combined with home-based exercise had a medium effect on sleep quality. Interventions with aerobic exercise, especially the 4 to 8-week programs and those with weekly volume of 80-149 minutes per week for cancer patients with ongoing or completed treatment had a medium to large positive effect.

### **Content Outline:**

#### Introduction

Sleep problems cause physical and mental distress which intangibly decreased the survival of cancer patients. Previous studies have shown exercise could improve sleep quality. However, current exercise intervention studies showed inconsistent results. Therefore, this meta-analysis aimed to reveal the efficacy of exercise intervention in enhancing subjective sleep quality and objective sleep onset latency in cancer patients.

#### Body

##### A. Main Point #1: The effect of exercise intervention on sleep quality

1. Supporting point #1: Exercise intervention can improve total subjective sleep quality (TSSQ), sleep quality, sleep latency, and objective sleep onset latency

##### B. Main Point #2: To determine the variance of exercise intervention effect on different patient characteristics by subgroup analyses

1. Supporting point #1: The groups of a home-based exercise and a supervised exercise combined with a home-based exercise had a medium effect on TSSQ than the usual group.

2. Supporting point #2: Interventions with aerobic exercise, especially the 4 to 8-week programs and those with weekly volume of 80 to 149 minutes per week for cancer patients with ongoing or completed treatment also had a medium to large positive effect on TSSQ.

3. Supporting point #3: Patients with breast cancer and hematologic malignancies contributed a small effect.

#### Conclusion

Our study support that exercise intervention, especially aerobic exercise, has a positive effect on TSSQ and objective sleep onset latency in cancer patients. Thus, maintaining regular aerobic exercises, even of different duration and weekly volumes, benefits patient sleep quality.

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