Associations Between Pre-Treatment Insomnia Symptoms and Perceived Cognitive Impairment in Women with Non-Metastatic Breast Cancer

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Introduction

- More women are experiencing long-term breast cancer (BCa) survival than ever before
- There is an ever-growing need to understand the adverse effects associated with BCa and treatment
- Up to 75% of women experience cognitive impairment (CI) during treatment, however 30% experience CI prior to beginning treatment
- Factors independent of BCa and treatment are involved
- Women with BCa experience the highest rate of insomnia symptomology of all cancer types. They are also at increased risk of experiencing fatigue
- Few studies have investigated baseline PCI in women with BCa. Of the studies that do exist, sample sizes are small and contributing factors (i.e. insomnia, fatigue, depression) are not controlled for

Objective

- The goal of the present study was to examine the associations between PCI, insomnia, sleep quality, mood, and fatigue in pre-treatment women with BCa

Method

Participants

- Inclusion criteria: Females diagnosed with stage I-III BCa, scheduled to receive hormonal therapy, radiation, chemotherapy, or some combination of these, who were not previously treated for cancer
- Participants were recruited from the Dr. H. Bliss Murphy Cancer Centre in St. John's, Newfoundland

Procedure

- Participants were assessed before treatment
- A medical, psychological, and sleep disorder screen & the Mini Mental State Examination were administered to ensure participant eligibility
- Cognitive function, sleep outcomes, and secondary comorbid sleep outcomes were assessed using the self-report measures below
- Assessments took ~ one hour to complete

Measures

- Insomnia Severity Index (ISI)
- Functional Assessment of Cancer Treatment-Cognition (FACT-Cog)
- Hospital Anxiety and Depression Scale (HADS)
- Pittsburgh Sleep Quality Index (PSQI)
- Multidimensional Fatigue Symptom Inventory (MFSI)

Data Analysis

- A hierarchical regression model was used to examine associations between symptoms of insomnia, mood, fatigue, and CI, after statistically adjusting for age and education
- Zero-order and partial correlations were used to examine the relative importance of individual predictors

Results

- Data were collected from 86 women prior to initiating treatment for BCa
- On average, women were 59 years old (range 30-80) and had 14 years of education (range 7-25)
- After adjusting for age and education, the overall model was significant [$F(5, 76)=8.94$, $p<.001$], accounting for 36% of the unique variance in PCI

Table 1. Zero-order and partial correlations between variables and PCI

	Perceived Cognitive Impairment	
	Zero-order correlations	Partial correlations
Insomnia Severity	r = - 0.34 **	r = - 0.04
Sleep Quality	r = - 0.39 **	r = - 0.06
Fatigue	r = - 0.56 **	r = -0.39 **
Depressed Mood	r = 0.38 **	r = 0.14
Anxious Mood	r = 0.37 **	r = -0.04

Note: ** p < .001

- After partitioning out variability from other independent variables, only fatigue remained significantly associated with PCI, accounting for 15.3% unique variance

Table 2. Follow up hierarchical regression of the effect of fatigue on PCI

Predictor	b	SE b	*t*	Sig.
General fatigue	**-0.595**	**0.250**	**-2.379**	**.020***
Physical fatigue	-0.235	0.336	-0.701	0.486
Emotional fatigue	0.276	0.251	1.099	0.275
Mental fatigue	**-1.395**	**0.241**	**-5.781**	**0.000****
Vigor	-0.204	0.216	-0.941	0.350

Note: *p < .05, **p < .001
$R^2 = 0.580$

Discussion

- The present study is one of the first to investigate the effects of sleep, insomnia, mood, and fatigue on PCI in women with BCa
- Even before undergoing cancer treatment, sleep, mood, and fatigue are associated with PCI in women with BCa
- Fatigue, particularly general fatigue (e.g. I am worn out) and mental fatigue (e.g. I make more mistakes than usual), have the strongest relationships with PCI
- Fatigue should not be overlooked and may represent a meaningful treatment target in women with BCa and PCI

Future Directions

- It is important for future research to consider the complex interplay between sleep, insomnia, mood, and fatigue when investigating CI
- Future research should invariably include pre-treatment assessment of fatigue, mood, and sleep to better inform intervention for CI
- This study is part of a larger ongoing prospective study of sleep and cognition in women with non-metastatic breast cancer

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