

Relationship Of Physical Activity And Perceived Fatigue In Men Receiving External Beam Radiation Therapy For Non-metastatic Prostate Cancer

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Introduction

- Fatigue is a distressing symptom reported during EBRT for prostate cancer ¹
- Fatigue is a complex symptom with multifactorial causes and related symptoms
- Fatigue may be related to treatment or cancer itself
- The relationship of fatigue and objectively measured physical activity has been largely unexplored

Research Questions

1. Is there a relationship between physical activity and fatigue at baseline, midpoint and conclusion of EBRT therapy?
2. Does physical activity predict fatigue at midpoint and completion of EBRT?

Theoretical Framework

The National Institutes of Health Symptom Science Model (NIH-SSM)²

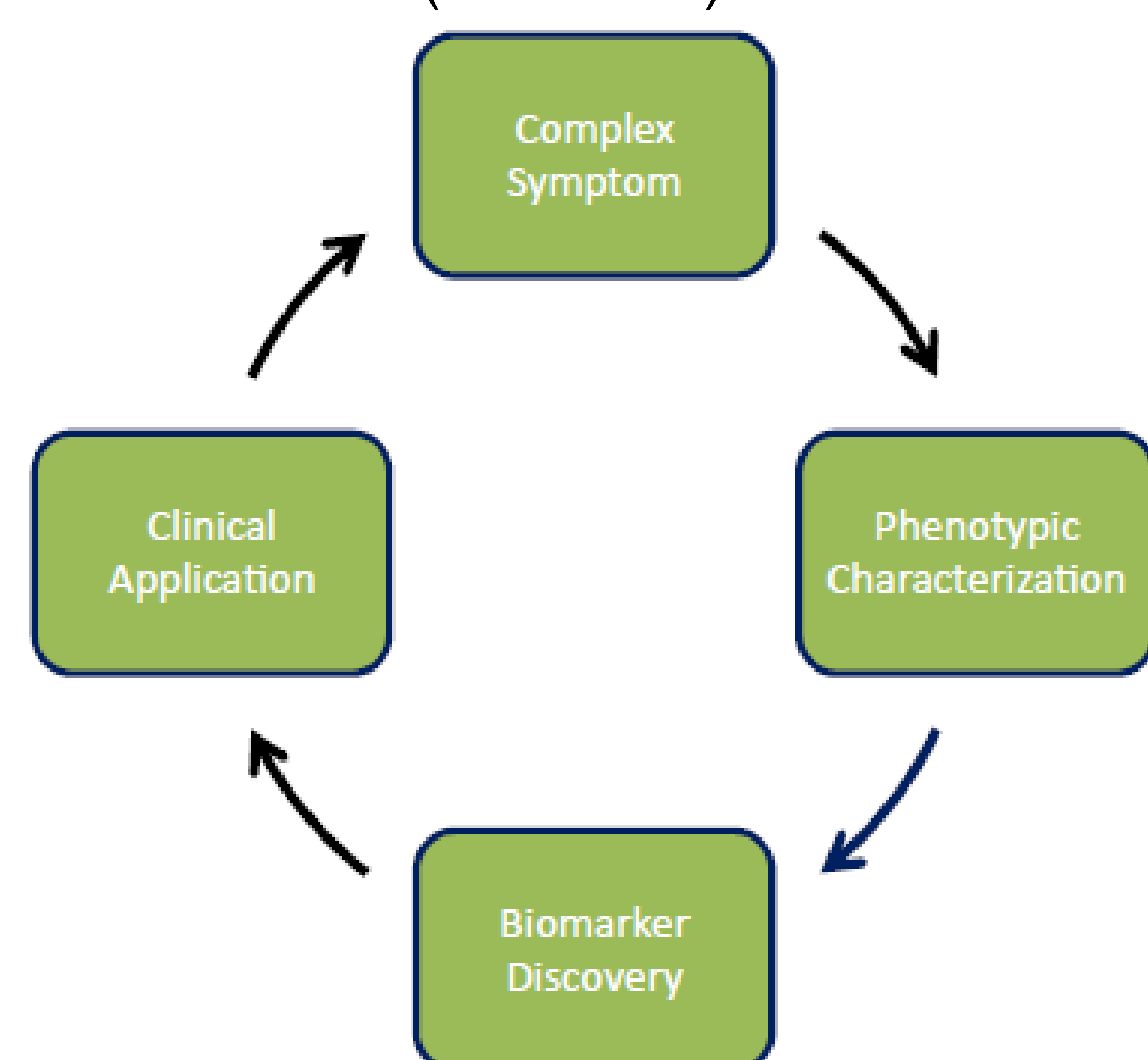


Figure 1: The National Institutes of Health-Symptom Science Model (NIH-SSM). (From Cashion, Gill, Hawes, Henderson & Saligan (2016). Used with permission.)

Methods

- 57 Men with prostate cancer receiving EBRT
- Observational, correlational study
- Examined the relationship between physical activity level and perceived fatigue at three time points, baseline (prior to EBRT), midpoint (Day 19-21) and post-therapy (Day 38-42).

Variables

- Free living physical activity measured with an accelerometer and daily logs.
- Perceived fatigue, measured with the Functional Assessment of Cancer Therapy-Fatigue FACT-F
- Sleep Disturbance measured with PROMIS-SD
- Hemoglobin
- Age, BMI (baseline only)
- Accelerometry data inspected and cleaned
 - Amount of time device worn
 - Distinguishing periods of non wear
 - Removing periods of non-wear
 - Assessing for erroneous values

- Activity counts calculated for entire wear period and 2:00-6:00 pm

Statistical Analysis

- Pearson Correlation
- Linear Regression

Results

Summary of findings by time point

	Baseline	Midpoint	Completion
Correlations with increased Fatigue	Sleep disturbance (r=.49, p<.005)	Sleep disturbance (r=.33, p=.01)	Sleep disturbance (r=.34, p=.01)
	Younger age (r=-.29, p=.03)	Lower hemoglobin (r=-.48, p<.005)	Lower hemoglobin (r=-.41, p=.001)
Correlations with decreased physical activity	Older age (r=-.26, p=.05)	Higher BMI (r=.32, p=.01)	Higher BMI (r=.30, p=.03)
	--	Older age (r=-.26, p=.05)	Older age (r=-.26, p=.05)
Predictors of fatigue	--	Lower hemoglobin (p<.005)	Lower hemoglobin (p=.038)
	--	Baseline fatigue (p<.005)	Baseline fatigue (p<.005)
			Total physical activity counts (p=.049)

Results (cont)

Pearson Correlations: Physical Activity

- No correlations between total or evening physical activity counts and other study variables
- Age: baseline and completion (p=.05, r = -.26)

Regression Models

- Predictive of fatigue score at both midpoint and completion of therapy, using separate models for total physical activity count and evening physical activity count.

Midpoint of therapy:

Model 1: $p<.005$, adj. $R^2 = .627$.

Model 2: $p<.005$, adj. $R^2 = .628$

Completion of therapy:

Model 3: $p<.005$, adj. $R^2 = .513$.

Model 4: $p<.005$, adj. $R^2 = .481$

Summary of Multiple Regression Analysis-Completion, total Physical Activity Counts

Variable	B	SE _B	β	p
(Constant)	5.547	2.50		.031
FACT-F (baseline)	.521	.113	.503	<.005
BMI	.027	.032	.085	.397
Hgb (completion)	-.298	.139	-.217	.038
PROMIS SD (completion)	.020	.016	.146	.202
Total activity counts (completion)	-.949	.470	-.196	.049

- For all four models, hemoglobin & baseline fatigue were significant predictors of fatigue at midpoint and completion of therapy\
- BMI, PROMIS-SD and evening physical activity counts did not add significantly to any of the models
- Total physical activity counts were a significant predictor of fatigue at completion

Discussion

- Physical activity and fatigue were not correlated at any time points.
- Total physical activity counts were predictive of fatigue at completion of therapy.
- Lower hemoglobin, baseline fatigue and total physical activity counts were predictive of fatigue at completion of therapy.
- Men may have continued their usual activities despite fatigue during therapy until completion when fatigue required decreasing activity
- May have been sedentary prior to therapy, thus showing little variation in response to fatigue

Implications

- Predictors of fatigue should be monitored for to facilitate prompt intervention
- Patients, families and health professionals should be aware that fatigue is likely even in the absence of a noticeable change in physical activity.

References

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2. Cashion, A. K., Gill, J., Hawes, R., Henderson, W. A., & Saligan, L. (2016). National Institutes of Health symptom science model sheds light on patient symptoms. *Nursing Outlook*, 64(5), 499-506. doi:10.1016/j.outlook.2016.05.008

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