STEP COUNT AND SYMPTOM BURDEN DURING CANCER TREATMENT

Bridget Nicholson, PhD, AOCNP
Ann Marie Moraitis, PhD, MS, RN
Keiko Cawley, BS
Bob Wong, PhD, MS
Christina Echeverria, MS, RN
Kathi Mooney, PhD, RN, FAAN

Huntsman Cancer Institute
College of Nursing
University of Utah
Salt Lake City, UT, USA
The University of Utah

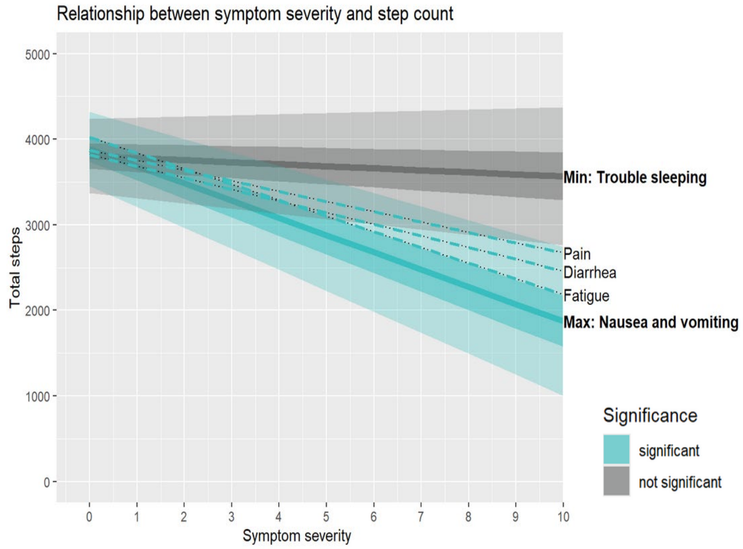
This study highlights the promise of passive step count tracking to monitor symptom burden.

BACKGROUND

High levels of symptom burden persist in patients receiving cancer treatment. Symptom burden impacts adherence to treatment, activity levels, functional status, and quality of life. While electronic patient reporting (ePRO) has improved symptom reporting, there are limited passive measures to quantify symptom burden. Mechanisms to measure patient physical activity (PA), such as step count, may offer insight into symptom burden throughout cancer treatment. This study examined the relationship between symptom burden and daily step count.

METHODS

This study was a secondary analysis of the subgroup of patients who were provided Garmin activity monitors for Symptom Care at Home, a digital automated symptom monitoring and coaching program.
Patients reported symptom ratings of 11 common oncology symptoms each day via Interactive Voice Response (IVR): nausea, fatigue, diarrhea, numbness and tingling, pain, trouble breathing, feeling nervous or anxious, trouble thinking, mouth discomfort, feeling blue, and trouble sleeping. This subgroup reported steps daily via Garmin activity monitor.
We examined the demographic variables of patients reporting both symptoms and steps. We then analyzed the correlation between reported steps and symptoms to determine the relationship between symptom severity rating and step count during cancer treatment.



RESULTS

- Participants reported daily step count & ePRO symptom severity: n= 185/339 (54%)
- Mean daily weighted step count: 3764.52 (SD 2585.39).
- Total unique step reports =11800.
- Mean reports per patient= 63.78 (44.04).
- Mean symptom burden sum for patients who reported > 8 symptoms= 5.74 (7.7).
- **Within the model, 9/11 symptoms significantly decreased the number of steps when there was a 1-point symptom increase.**
- **For each 1-point symptom increase, there was a decrease in daily steps for each following symptom (*=p<.001).**

  Nausea: (-201.48 steps), t(184) =- 9.04*

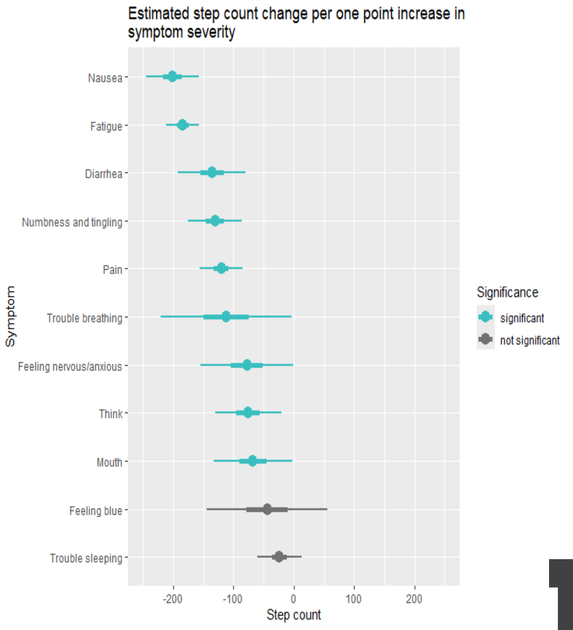
  Fatigue: (-184.00 steps), t(184) = -13.27*

  Diarrhea: (-135.76 steps), t(184) = 4.71*

  Numbness/tingling: (-130.93 steps), t(184) = -5.79*

  Pain:(-120.6 steps), t(184) = -6.59*

Participant Demographics of those who report daily step count and ePRO symptoms (n=185)	
	Mean
Age	59 yrs. (±13)
	N (%)
Gender	
Female	114 (62.0)
Male	71 (38.0)
Race	
African American	45 (24.0)
Caucasian	133 (72.0)
Other	7 (3.8)
Partner status	
Partnered	128 (69.0)
Not partnered	57 (31.0)
Education	
Some college or >	115 (85.0)
High school	28 (15.0)
< High school	6 (3.2)
Cancer diagnosis	
Breast	33 (18.0)
Lung	24 (13.0)
CRC	23 (12.0)
Ovarian	14 (7.6)
Pancreatic	17 (9.2)
Other	74 (40.0)
Cancer stage	
Stage I	32 (17.0)
Stage II	29 (16.0)
Stage III	44 (24.0)
Stage IV	69 (37.0)
Unknown	11 (5.9)



DISCUSSION

This study highlights the relationship between a 1-point increase in symptom burden, which decreased individual step counts in 9/11 symptoms. Capturing step count decreases due to symptom burden may be a valuable passively monitored biomarker for clinicians to detect symptom and PA changes. Increased symptom burden and reduced step count, over time, can impact the ability to participate in treatment regimes, functional capacity, and quality of life in patients receiving cancer treatment. This study underscores the benefit of passively monitored biometric data collection as another measure of symptom burden. Further, concerns exist that daily decreases have a cumulative effect, which may significantly impact functional status and quality of life. Emphasis on improving both symptom management and PA intervention support can mitigate symptom burden and decrease step count decline during chemotherapy treatment.
This underscores the need to manage symptoms aggressively and improve engagement in recommended PA programs to support adherence to treatment regimens and physical function. It also demonstrates the value of passively monitoring biometric data as a less burdensome measure of patient symptom experience.

NEXT STEPS

- Continue to examine the relationship of step count as a biomarker for cancer symptoms, particularly in patients where symptom reporting can become burdensome, i.e., advanced cancer.
- Examine additional passively reported biomarkers related to symptom experience to ease patient reporting burden.
- Evaluate programs to improve patient uptake of PA to improve symptom control treatment adherence and thereby avoid functional status declines in patients undergoing cancer treatment.

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COLLEGE OF NURSING UNIVERSITY OF UTAH
UNIVERSITY OF UTAH HUNTSMAN CANCER INSTITUTE