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10-2017

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Mary Insana Fisher  
*University of Dayton*, [mary.fisher@udayton.edu](mailto:mary.fisher@udayton.edu)

Anne Fleischer  
*Eastern Kentucky University*


Lynn Hendricks  
*University of Dayton*

Megan McClure  
*University of Dayton*

Kim Parent  
*University of Dayton*

*See next page for additional authors*

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### eCommons Citation

Fisher, Mary Insana; Fleischer, Anne; Hendricks, Lynn; McClure, Megan; Parent, Kim; and Roberts, Renee, "Perceived Stress Levels May Impact Upper Extremity Function Among Women Treated for Breast Cancer" (2017). *Physical Therapy Faculty Publications*. 57.  
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**Author(s)**

Mary Insana Fisher, Anne Fleischer, Lynn Hendricks, Megan McClure, Kim Parent, and Renee Roberts



# Perceived Stress has a Negative Effect on Self-Reported Upper Extremity Function among Women Treated for Breast Cancer

Mary Insana Fisher, PT, PhD,\* Anne Fleischer, PhD, MPH, OT/L, CLT-LANA,† Lynn Hendricks,\* Megan McClure,\* Kim Parent,\* Renee Roberts\*  
\*Department of Physical Therapy, University of Dayton, Dayton, OH; †Occupational Science and Occupational Therapy Department, Eastern Kentucky University, Richmond, Kentucky

## Background

Women treated for breast cancer report ongoing upper extremity disability with functional limitations; however, objective measures do not appear to explain the extent of perceived dysfunction. Investigating perceived stress will aid in a more comprehensive understanding of the impact of cancer treatment on physical function and aid in more effective rehabilitation strategies.

## Purpose

The purpose of this study was to investigate the relationship between self-reported upper extremity function and perceived stress level, fear of physical activity, and objective measures of upper extremity function including range of motion (ROM), strength, and muscular endurance, among women treated for breast cancer.

## Participants

A convenience sample of 24 women with unilateral breast cancer who were diagnosed between 12 and 60 months (mean=30) prior to data collection participated in this study. Survivor's mean age was 52 (31- 68 years) and mean BMI was 28.07 kg/m<sup>2</sup> (SD = 6.6). Four percent of survivors were diagnosed with stage 0, 32% stage 1, 36% stage 2, and 20% stage 3 breast cancer. Survivors had the following cancer types: ductal carcinoma in situ (24%), invasive ductal carcinoma (52%), or invasive lobular carcinoma (16%); surgical treatments: lumpectomy (36%) or mastectomy (64%); and treatment: chemotherapy (56%), and/or radiation (71%).

## Methods

Participants completed the following questionnaires: Disabilities of the Arm, Shoulder and Hand (DASH), Perceived Stress Scale (PSS), Fear of Physical Activity/Exercise Scale - Breast Cancer (FPAX-B), and the Functional Assessment of Cancer Therapy for Breast Cancer (FACT-B). Bilateral arm flexion, external rotation, and internal rotation ROM was measured with a digital inclinometer. The strength of the same motions was measured with a hand held dynamometer fixed to a stationary device. Bilateral arm muscle endurance was measured using the Upper Limb Lift Test. Descriptive statistics were calculated for all variables and relationships between the DASH and the PSS, FPAX-B, FACT-B and objective measures were analyzed with Pearson's correlation r.

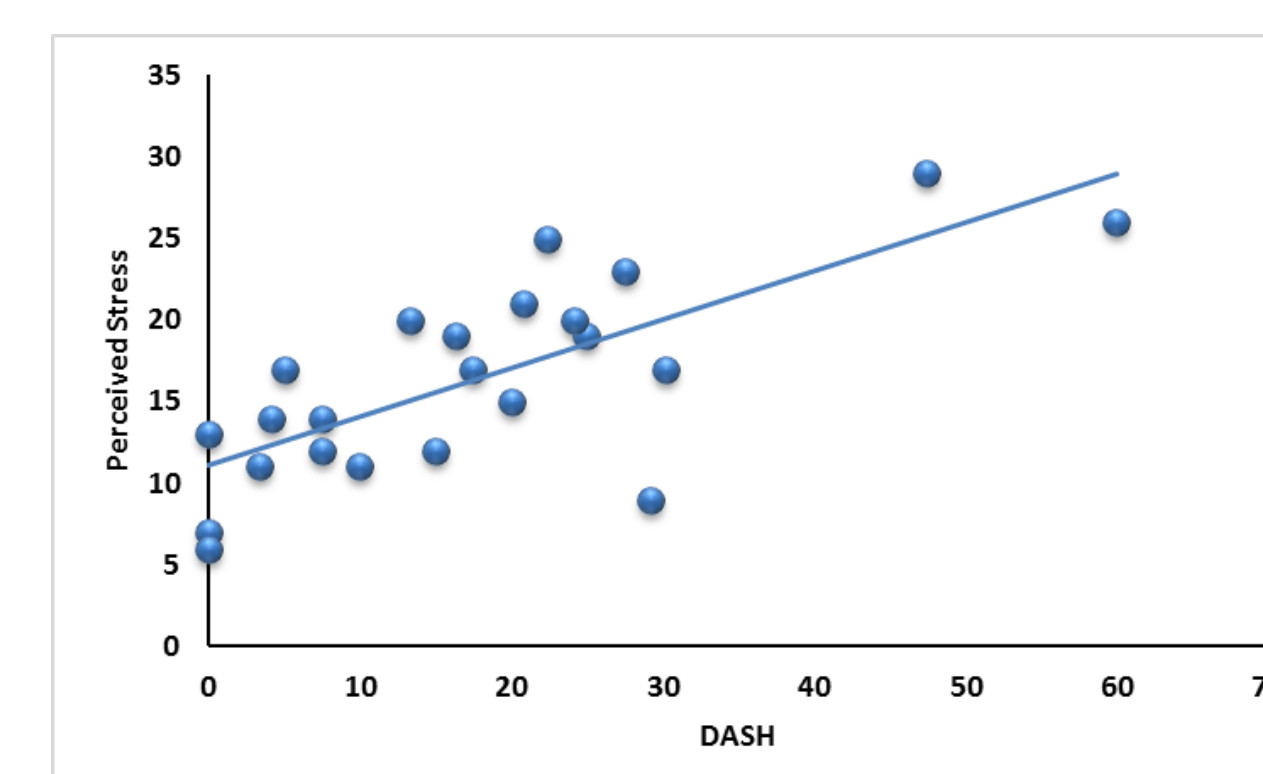
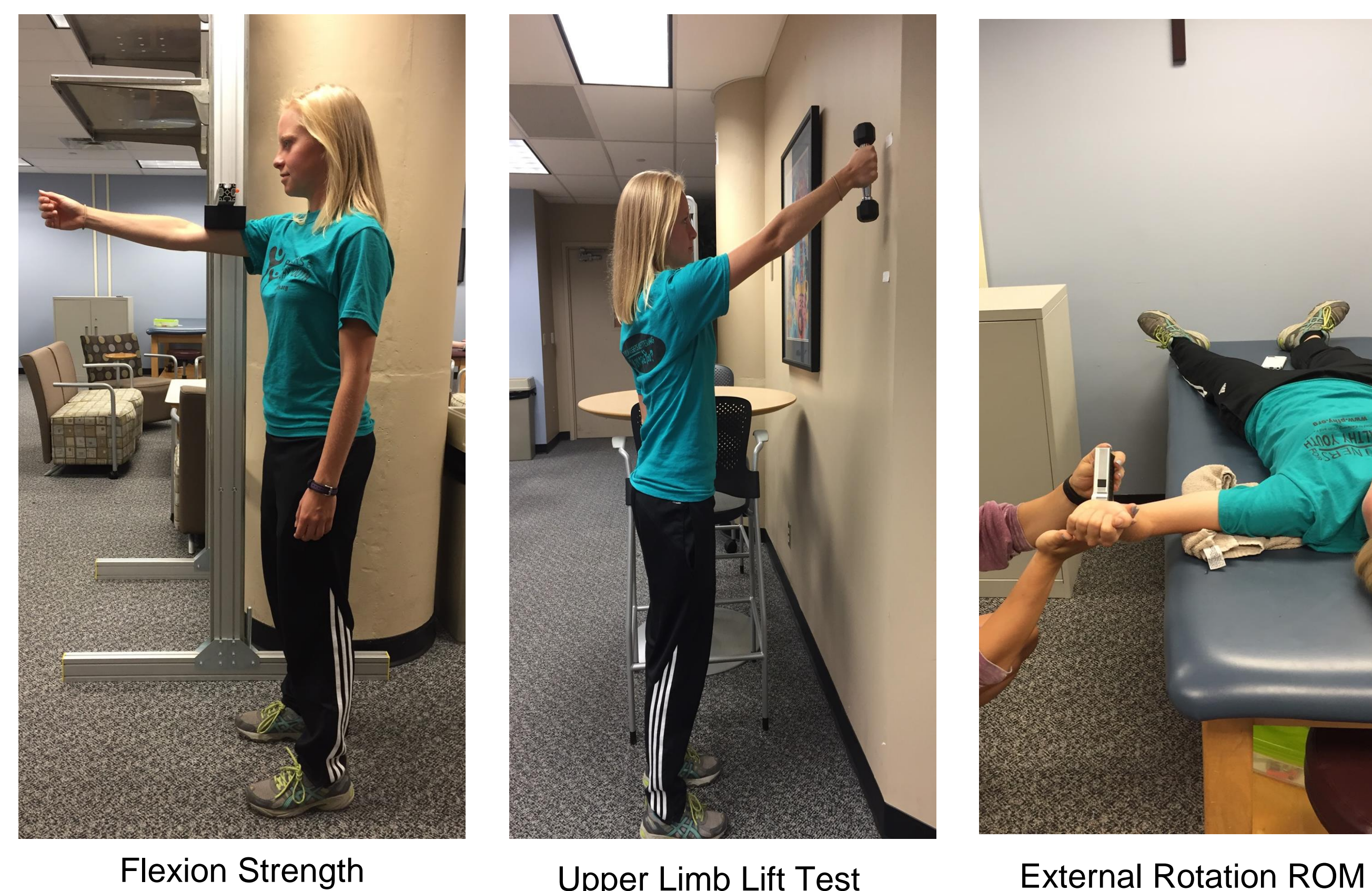


Figure 1: Perceived Stress and DASH

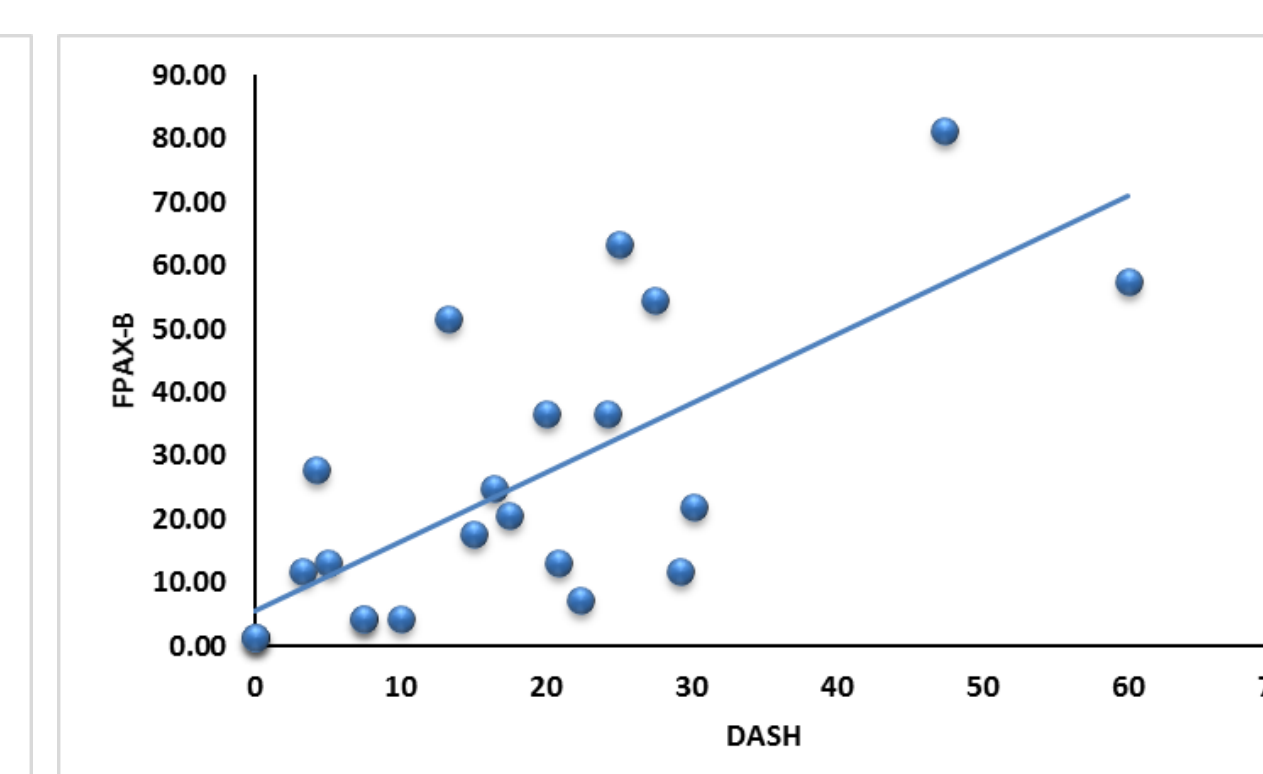


Figure 2: Fear of Physical Activity and DASH

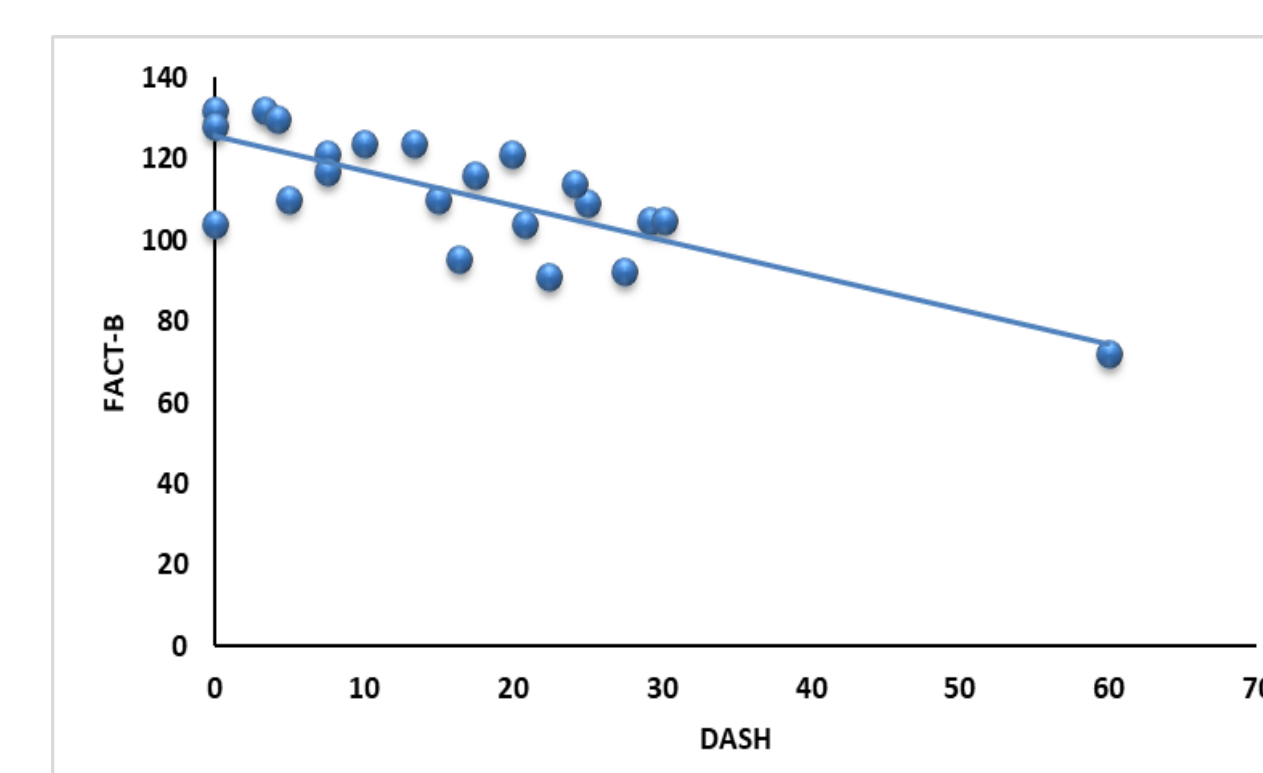


Figure 3: FACT-B QOL and DASH

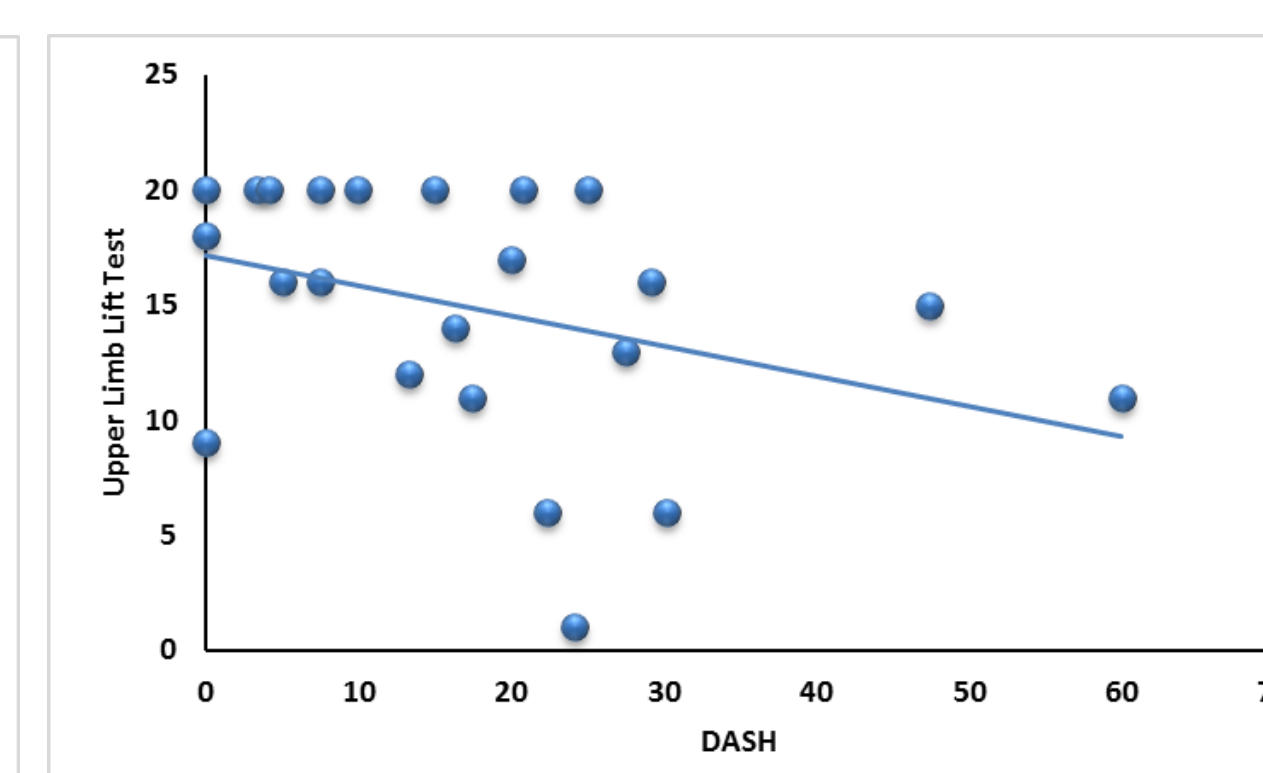


Figure 4: Muscular Endurance and DASH

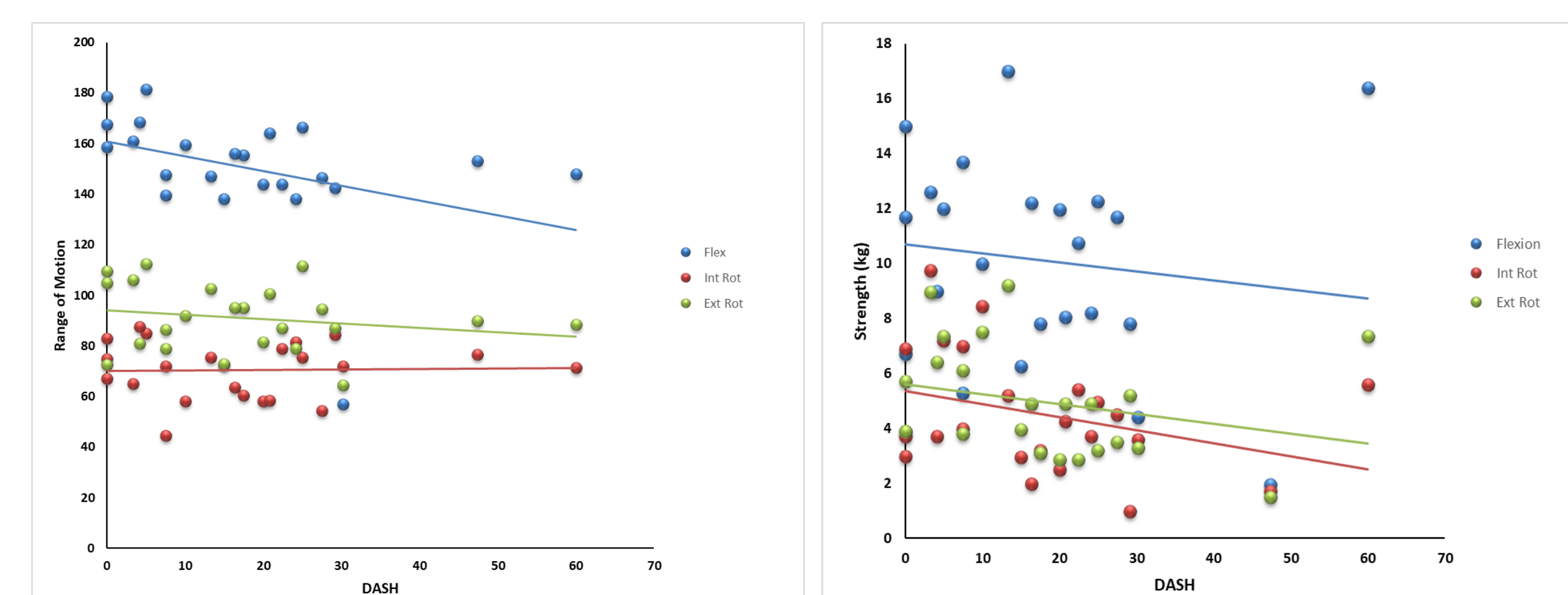


Figure 5: Dominant Range of Motion and DASH

Figure 6: Dominant Strength and DASH

## Results

The PSS, FPAX-B, and FACT-B were significantly correlated ( $p=0.000$ ) with the DASH ( $r= -.739$ ;  $r= -.717$  and  $r= .779$  respectively). No significant correlation was found between the DASH and the objective ROM, strength, or muscular endurance measures. See Figures 1-6 for scatterplots of dependent measures.

## Discussion

- Self reported measures of function are moderately correlated to perceived stress and fear of physical activity.
- Self-reported measures of upper extremity function show no significant correlation to objective measures of ROM, strength, or muscular endurance.
- Investigating the impact of stress and fear of physical activity on self-perceived upper extremity function in women treated for breast cancer may help clinicians identify and address barriers to recovery for this population.

## Clinical Relevance

The experience of stress and fear of physical activity appears to result in lower levels of self-reported upper extremity function despite adequate motion, strength, and muscular endurance. Perceived stress and other cognitive constructs not measured within this study, may explain the apparent differences among objective and perceived measures of function currently observed in this population. Further exploration of self-perceived stress and its relationship to upper body function is warranted.

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\*Completed in partial fulfillment of degree requirements for the University of Dayton, Doctor of Physical Therapy degree