



Contents lists available at ScienceDirect

## Archives of Gerontology and Geriatrics

journal homepage: [www.elsevier.com/locate/archger](http://www.elsevier.com/locate/archger)

## The impact of body composition, pain and resilience on physical activity, physical function and physical performance at 2 months post hip fracture



Barbara Resnick<sup>a,\*</sup>, J. Richard Hebel<sup>b</sup>, Ann L. Gruber-Baldini<sup>b</sup>, Gregory E. Hicks<sup>c,d</sup>,  
Marc C. Hochberg<sup>e</sup>, Denise Orwig<sup>b</sup>, Marty Eastlack<sup>f</sup>, Jay Magaziner<sup>b</sup>

<sup>a</sup> University of Maryland, School of Nursing, 655 West Lombard Street, Baltimore, MD, 21201, USA

<sup>b</sup> University of Maryland School of Medicine, Department of Epidemiology and Public Health, Baltimore, MD, 21201, USA

<sup>c</sup> University of Delaware, Department of Physical Therapy, USA

<sup>d</sup> University of Delaware, STAR Health Sciences Complex, USA

<sup>e</sup> University of Maryland School of Medicine, Departments of Medicine and Epidemiology and Public Health, Baltimore, MD, 21201, USA

<sup>f</sup> Arcadia University, Department of Physical Therapy, 450 S. Easton Rd., Glenside, PA, 19038, USA

### ARTICLE INFO

#### Keywords:

Hip fracture  
Body composition  
Physical activity  
Function  
Male and females  
Older adults

### ABSTRACT

The purpose of this study was to test a model of the factors influencing physical activity, physical function and physical performance at 2 months post hip fracture and compare model fit between men and women. Age, cognitive status, comorbidities, pain, resilience, bone mineral density, total body lean mass, total body fat and grip strength were hypothesized to be directly and/or indirectly related to physical activity, physical function and physical performance. This analysis used data from the seventh Baltimore Hip Studies (BHS-7), a prospective cohort study that included 258 community-dwelling participants, 125 (48%) men and 133 (52%) women, hospitalized for treatment of a hip fracture; survey and objective data were obtained at 2 months post hip fracture. In addition to age, sex and comorbidities (modified Charlson scale), data collection included body composition from dual-energy x-ray absorptiometry (DXA) scans, grip strength, and physical activity, function and performance based on the Yale Physical Activity Survey, the Short Physical Performance Battery and the Lower Extremity Gait Scale. Age, cognition, and comorbidities were not significantly associated with resilience; and, resilience was not associated with pain. In addition, bone mineral density was not associated with physical activity, physical performance or physical function. Total lean body mass, resilience and pain were associated with physical activity, physical function and physical performance in women, but were not consistently associated with physical and functional outcomes in men. Future research should consider evaluation of muscle quality and additional psychosocial factors (e.g., depression, social supports) in model testing.

### 1. Introduction

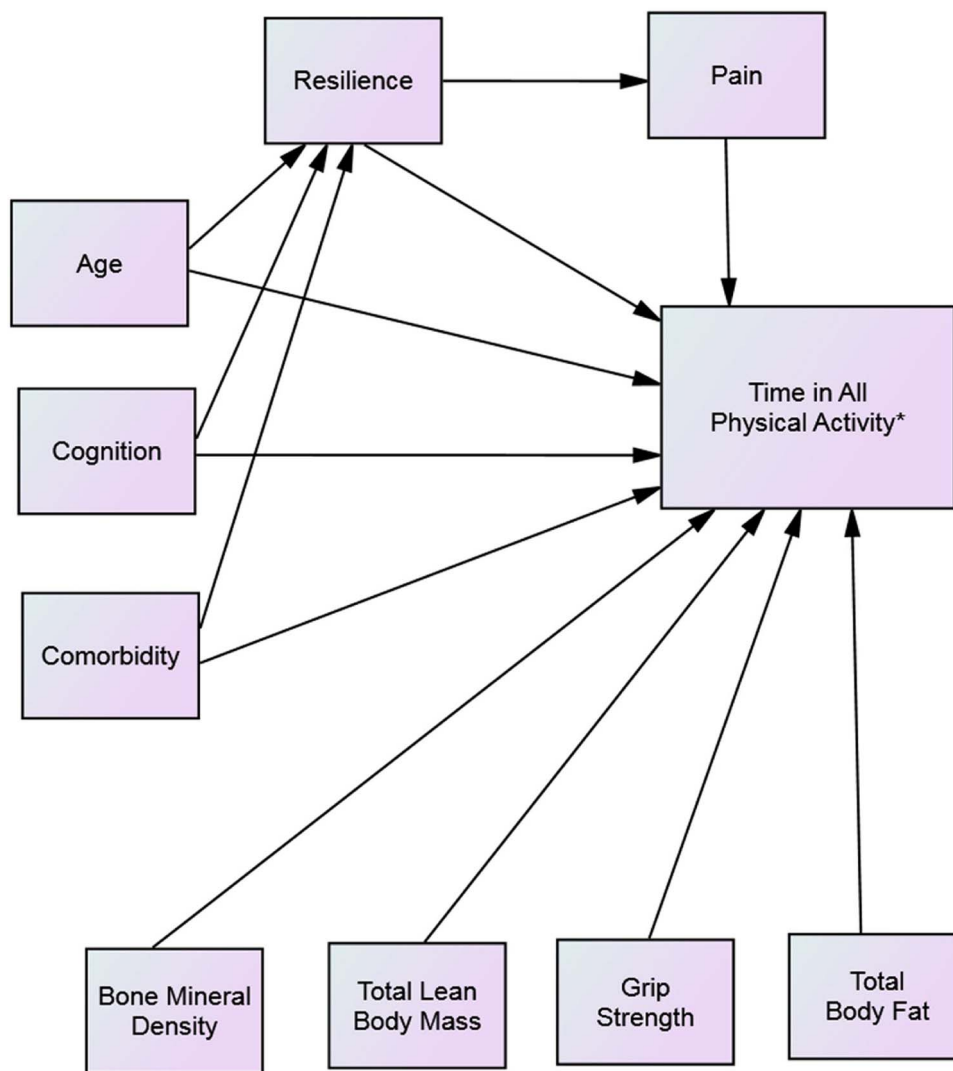
Despite attempts to improve the recovery process post hip fracture (Besdine, 2018), at least 25% of older adults do not ever regain their baseline functional ability, especially with regard to transfers, ambulation and stair climbing (Alarcon, Gonzalez-Montalvo, Gotor, Madero, & Otero, 2011; Arinzon, Shabat, Peisakh, Gepstein, & Berner, 2010; Visser, Harris, & Fox, 2000). The return to baseline physical function is influenced by many factors including cognitive status, surgical intervention, age, sex, other comorbid conditions, course following surgery, psychosocial factors such as pain, mood, resilience, and having positive social supports (Arinzon et al., 2010; Ariza-Vega, Jiménez-Moleón, & Tange Kristensen, 2014; Beaupre, Jones, Johnston, Wilson, & Majumdar, 2012; Gruber-Baldini, Zimmerman, & Morrison, 2003;

Ortiz-Alonso, Vidán-Astiz, & Alonso-Armesto, 2012; Taraldsen, Sletvold, & Thingstad, 2014). The impact of body composition, particularly total body fat and lean mass, on the recovery process has also been studied. Losses of both bone mineral density (BMD) and lean mass, and increases in body fat have been observed in the year following hip fracture, and the rate of decline in BMD is greater than expected compared to similarly aged older women (Magaziner, Wehren, & Hawkes, 2006; Visser et al., 2000). Normal aging also results in changes in body composition including a persistent decrease in muscle mass and increase in fat mass (Raguso, Kyle, & Kossovsky, 2006) and these changes were noted to be associated with declines in physical activity and functional performance (Charlton, Batterham, & Langford, 2015; McGregor, Cameron-Smith, & Poppitt, 2014; Woo, Leung, & Kwok, 2007). It is anticipated, therefore that body composition is likely to

\* Corresponding author.

E-mail address: [eastlachm@arcadia.edu](mailto:eastlachm@arcadia.edu) (B. Resnick).

**Full Model Testing**  
 \*(Same model tested for Short Physical Performance Battery;  
 Lower Extremity Gain Scale)



**Fig. 1.** Full Model Testing.  
 \*(Same model tested for Short Physical Performance Battery; Lower Extremity Gain Scale).

influence the recovery process among older adults post hip fracture.

*1.1. The impact of body composition (Fat and lean muscle mass) on function and physical activity*

Although there is evidence to support the association between body composition and function and physical activity, findings regarding the relative importance of body composition to function or activity are inconsistent. Moreover, the relationship between these components and outcomes may vary between men and women. One study reported that lower extremity fat-free mass was associated with a decline in function in both men and women (Fantin, Francesco, & Fontana, 2007), while other research found the relationship was only significant among women (Riebe et al., 2009; Straight, Brady, & Evans, 2015; Zoico, Di Francesco, & Mazzali, 2007). Muscle quality, defined as power per unit of muscle size, is significantly associated with function or performance among both men and women. In women, muscle quality was associated with both endurance and performance tasks including the 6 min walk and chair rise test (Brady, Straight, Schmidt, & Evans, 2014; Straight

et al., 2015). In men, muscle quality and physical activity were the best predictors of lower extremity function (e.g., getting up from a chair) while in women, muscle quality and the percentage of body fat were the factors that were most predictive of function (Straight et al., 2015). With regard to muscle quality, healthy older men, in addition to having higher levels of overall physical activity, lower visceral adiposity, greater lean mass and higher leg extension power, also have better muscle quality when compared to women.

*1.2. Differential recovery post hip fracture among men and women*

The major focus of hip fracture research has been on older women, given the higher incidence of fracture among these individuals (Adams et al., 2013; Abrahamsen, van Staat Ariely, Olson, & Cooper, 2009). Repeatedly, it has been noted that older men who experience a hip fracture tend to have more comorbidities and are more likely to die within the 6 months post hip fracture (Abrahamsen et al., 2009; Adams et al., 2013; American Psychological Association Help Center, 2018; Beaupre, Carson, Noveck, & Magaziner, 2015; Morrison, Dickman, &

Download English Version:

<https://daneshyari.com/en/article/8257419>

Download Persian Version:

<https://daneshyari.com/article/8257419>

[Daneshyari.com](https://daneshyari.com)