Archives of Gerontology and Geriatrics 58 (2014) 364–369

Contents lists available at ScienceDirect

Archives of Gerontology and Geriatrics

journal homepage: www.elsevier.com/locate/archger

Frailty, financial resources and subjective well-being in later life

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ARTICLE INFO

Article history:
Received 13 August 2013
Received in revised form 4 December 2013
Accepted 26 December 2013
Available online 18 January 2014

Keywords:
Frail elderly
FI
Well-being
Wealth
Income
Financial resources

ABSTRACT

Though frailty status has recently been linked to poorer quality of life, the impact of income on this relationship has not previously been investigated. Data from a population-based panel study, the English Longitudinal Study of Aging, on 3225 participants aged 65–79 years were analyzed cross-sectionally. A Frailty Index (FI) was determined for each participant as a proportion of accumulated deficits and participants were categorized into four groups on the basis of their FI score: very fit (0.00–0.10), well (0.11–0.14), vulnerable (0.15–0.24), and frail (≥0.25). Subjective well-being was assessed using the CASP-19 instrument, and levels of financial resources quantified using a range of questions about assets and income from a range of sources. Linear regression models were used to assess the relationship between frailty and well-being. There was a significant negative correlation between frailty and well-being; the correlation coefficient between FI and CASP-19 scores was −0.58. The relationship was robust to adjustment for sex, age, and relevant health behaviors (smoking and physical activity) and persisted when participants with depressive symptoms were excluded from analysis. Those with greater financial resources reported better subjective well-being with evidence of a "dose–response" effect. The poorest participants in each frailty category had similar well-being to the most well-off with worse frailty status. Hence, while the association between frailty and poorer subjective well-being is not significantly impacted by higher levels of wealth and income, financial resources may provide a partial buffer against the detrimental psychological effects of frailty.

1. Introduction

Frailty is an important concept in geriatric medicine. It is closely linked to advanced age and disease-related processes yet is a distinct construct (McMillan & Hubbard, 2012). Frailty is increasingly used as a marker of vulnerability, identifying individuals with a diminished capacity to effectively compensate for external stressors. In community-dwelling populations, those who are frail are at increased risk of death, institutionalization, and worsening disability (Fried et al., 2001; Rockwood, Song, & Mitnitski, 2011; Romero-Ortuno & Kenny, 2012).

While the definition and consequences of frailty are well established, there remain very different approaches to its measurement. One approach identifies frailty as a *clinical syndrome or phenotype* (a set of signs and symptoms that co-occur to characterize a specific medical condition). The Fried phenotype, for example, identifies frailty as the presence of ≥3 of 5 criteria: weight loss, exhaustion, weak grip strength, slow walking speed, low physical activity (Fried et al., 2001). An alternative to phenotypic approaches is to measure frailty based on the clinician's *subjective opinion* (Studenski et al., 2004). In a third approach, frailty is conceptualized as a *multidimensional risk state* measured by the quantity rather than the nature of health problems (Mitnitski, Mogilner, & Rockwood, 2001). In this paradigm, individuals accumulate deficits throughout their lives: the more deficits an individual has, the higher the likelihood they will be frail (Rockwood & Mitnitski, 2007). Understanding frailty has become the focus of extensive research. The associations of frailty with increasing age, female gender, functional dependence and chronic disease are now well described (Walston et al., 2006).

Though the relationships among aging, frailty, and psychological well-being have been less comprehensively explored (Fillit & Butler, 2009), a small number of studies have recently linked frailty to poorer quality of life. In 1318 community-dwellers, an index of self-rated health was moderately correlated with frailty ($r = 0.49$)

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http://dx.doi.org/10.1016/j.archger.2013.12.008

(Lucicesare, Hubbard, Searle, & Rockwood, 2010) and in 1008 older Hispanic adults being frail was significantly associated with lower scores on all physical and cognitive health related quality of life scales (Masel, Graham, Reistetter, Markides, & Ottenbacher, 2009). Similarly, in a larger cohort of 5703 participants of the Canadian Study of Health and Aging, frailty was significantly associated with poorer psychological well-being scores, independent of age, sex, education, cognition, and mental health (Andrew, Fisk, & Rockwood, 2012). Well-being has also been shown to be cross-sectionally associated with cognitive function in older adults (Llewellyn, Lang, Langa, & Huppert, 2008).

The impact of financial resources on subjective well-being has received more attention, though results are somewhat conflicting. While higher socioeconomic status has pervasive positive effects on both health and mortality (Marmot, 2005), the association between objective measures of wealth and psychological well-being is less clear cut. Some report strong positive associations between wealth and quality of life (Rosero-Bixby & Dow, 2009) and, within countries, those with higher incomes tend to be happier (Graham, 2008). Others argue that the overall contribution of economic status to subjective well-being is trivial (Myers, 2000) and that aspirations increase along with earnings such that "hedonic adaptation" and social comparison annul the positive effects of increased income (Easterlin, 2003). Wealth may become more important when individuals face difficult life circumstances. For example, in the US Health and Retirement Study those above the median in total net worth reported a smaller decline in well being after the onset of a disability than their less well-off peers (Smith, Langa, Kabeto, & Ubel, 2005).

In this study we had two objectives: first, to investigate the association between frailty and subjective well-being in older people; second, to explore the impact of household wealth and income on this relationship.

2. Methods

2.1. Sample

We used data from Wave 1 of the English Longitudinal Study of Aging (ELSA, 2002), a nationally representative panel study of 11,392 community-dwelling adults aged 50 and over in England. ELSA participants were recruited from households involved in the Health Survey for England, an annual government-sponsored cross-sectional survey, in 1998, 1999 and 2001. Households were included in ELSA if one or more individuals living there were aged 50 or over. Analyses of socio-demographic characteristics against census results indicated that the ELSA sample was representative of the English population aged 50 and over (Taylor, Conway, & Calderwood, 2003). In this analysis we included adults aged 65–79 who had complete data on frailty, well-being, and household wealth and income (n = 3225).

2.2. Measures

2.2.1. Frailty

We adopted the multi-dimensional risk state approach to frailty and used a FI to assess the health status of ELSA participants. The FI model employs a well-defined methodology to create an index as a proportion of deficits (Searle, Mitnitski, Gahbauer, Gill, & Rockwood, 2008). One important property of the FI is that the *number* rather than the *nature* of deficits can summarize health status. For example, in one study, items that made up the FI were selected randomly without replacement in 1000 iterations. These Frailty Indices yielded comparable estimates of the risk of adverse outcomes (Rockwood, Mitnitski, Song, Steen, & Skoog, 2006).

Frailty Indices been extensively investigated by research groups throughout the developed and developing world. In 4721 participants of the Cardiovascular Health Study, for example, the risk of adverse outcomes was defined more precisely by deficit indices than by the frailty phenotype (Kulminski et al., 2008). In Chinese samples comprising 2032 and 13,717 older adults respectively, the FI was used to measure "biological age" (Goggins, Woo, Sham, & Ho, 2005) and evaluated health status in relation to type of death (Dupre, Gu, Warner, & Yi, 2009). More recently, in 29,905 older Europeans, FI was a stronger predictor of mortality than chronological age (Romero-Ortuno & Kenny, 2012).

Frailty Indices can be constructed from different numbers and types of variables, allowing comparisons between datasets (Rockwood & Mitnitski, 2007). The included variables need to fulfill certain criteria (Searle et al., 2008): they should represent conditions that accumulate with age, should not saturate (i.e. become ubiquitous with age, such as presbycusis), should cross domains, and should be associated with adverse outcomes. In our cohort, 50 deficits comprised the FI (see Appendix), including sensory and functional impairments, self-reported co-morbidities, and a score in the lowest 10% of a composite cognitive function test. Each individual's deficit points were then summed and divided by the total number of deficits considered, to yield a FI with theoretical range 0–1. Higher values indicated a greater number of problems, and hence greater frailty.

Participants were categorized into four groups according to meaningful FI cut-points: very fit (0.00–0.10), well (0.11–0.14), vulnerable (0.15–0.24) and frail ($\geq$0.25). These FI scores are associated with different descriptors on a Clinical Frailty Scale. In a study of 2305 community-dwellers, increments in this scale were associated with significantly increased risks of death and institutionalization (Rockwood et al., 2005).

2.2.2. Subjective well-being

Subjective well-being was measured using the CASP-19, a validated measure of psychological well-being in older people (Hyde, Wiggins, Higgs, & Blane, 2003). This self-completed questionnaire uses 19 Likert-scored items to rate quality of life across ontologically grounded areas based on Maslow's hierarchy of needs (McLeod, 2007): control, autonomy, pleasure, and self-realization. The scale ranges from 0, which would represent a complete absence of quality of life, to 57, indicative of total satisfaction in all four domains.

2.2.3. Household financial resources: wealth and income

Household wealth was assessed using a range of questions in which participants were asked about household levels of net wealth: financial wealth (savings, stocks and bonds, and other investment vehicles) and income from a range of sources (paid employment, returns on investments, pensions, etc.). For the purposes of analysis we divided total net wealth and total net income by quintiles.

2.3. Analysis

We used weighted multiple linear regression models to examine whether frailty was associated with subjective well-being with or without adjustment for wealth and income. Adjustment was made for a range of potential confounders: sex, age, tobacco smoking (non-smoker versus current smoker), and participation in moderate physical activity at least once per week. Hence in Model 1, the relationship between frailty and well-being was adjusted for age, sex, smoking, and level of physical activity; in Model 2, the relationship between frailty and well-being was adjusted for age, sex, smoking, level of physical activity, net financial wealth, and net income. Models were weighted to