



Assessment of frailty in community-dwelling older adults residents in the Lazio region (Italy): A model to plan regional community-based services



Giuseppe Liotta, Prof.^{a,*}, Rónán O’Caoimh^b, Francesco Gilardi^a, Maria Grazia Proietti^{c,d}, Gennaro Rocco^c, Rosaria Alvaro^a, Paola Scarcella^a, D. William Molloy^e, Stefano Orlando^f, Sandro Mancinelli^a, Leonardo Palombi^a, Alessandro Stievano^c, Maria Cristina Marazzi^g

^a Biomedicine and Prevention Dept, University of Rome “Tor Vergata”, Via Montpellier 1, 00173, Rome, Italy

^b Health Research Board, Clinical Research Facility Galway, National University of Ireland, Galway, Ireland

^c IPASVI – Centre of Excellence for Nursing Scholarship, Viale Giulio Cesare 78, 00192 Rome, Italy

^d Social Cooperative Nuova Sair, Viale del Tecnopolo 83, 00131 Rome, Italy

^e Centre for Gerontology and Rehabilitation, University College Cork, St Finbarrs Hospital, Cork City, Ireland

^f Dept of Health Economics, Community of Sant’Egidio – DREAM program, Via San Gallicano 25, Rome, Italy

^g LUMSA University, Rome, Italy

ARTICLE INFO

Article history:

Received 10 April 2016

Received in revised form 6 August 2016

Accepted 8 August 2016

Available online 12 August 2016

Keywords:

Community based interventions
Community-dwelling older adults
Frailty
Functional decline
Multidimensional assessment
Public health nurses

ABSTRACT

Purpose of the study: The prevalence of frailty is expected to increase worldwide in parallel with demographic ageing. Despite this, little is known about the prevalence in different populations particularly community-based samples. This cross-sectional study evaluates the prevalence of frailty in a community-dwelling older adult population and describes a methodology to plan community-based interventions.

Methodology: A random sample of 1331 older adults, resident in the Lazio-Region of Italy, were screened by trained public health nurses (PHNs) by administering a validated questionnaire (the Functional Geriatric Evaluation questionnaire). Prevalence of frailty was calculated using the Final Synthetic Score derived from the questionnaire’s Final Score. Variables associated with frailty were selected through univariate and multivariate statistical analysis.

Results: Prevalence of frail (FS $\geq 10, \leq 50$) and very frail (FS < 10) individuals was 13.9% and 7.6% respectively. Variables associated with frailty were age (older than 85 years), disability, living alone or the presence of a paid carer, lower education and neurological disorders like stroke, dementia, Parkinson disease and other neuropsychiatric diseases; Anaemia or cancer were also associated with a higher prevalence of frailty.

Discussion: The study provide a comprehensive picture of the prevalence of frailty and factors associated to this condition in community-dwelling older adults. On the basis of the study results, a plan of community-based services could address the needs of care of the elderly population. A trained team of PHNs may be the most appropriate personnel to carry out multidimensional frailty assessment in this setting.

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* Corresponding author. Biomedicine and Prevention Dept, University of Rome “Tor Vergata”, Via Montpellier 1, 00133-Rome, Italy.

E-mail addresses: giuseppe.liotta@uniroma2.it (G. Liotta), rocaoimh@hotmail.com (R. O’Caoimh), francesco.gilardi@gmail.com (F. Gilardi), mariagrazia.proietti@nuovasair.it (M.G. Proietti), genna.rocco@gmail.com (G. Rocco), rosaria.alvaro@gmail.com (R. Alvaro), paola.scarcella@gmail.com (P. Scarcella), w.molloy@ucc.ie (D. W. Molloy), steorlando@gmail.com (S. Orlando), sandro.mancinelli@gmail.com (S. Mancinelli), leonardo.palombi@gmail.com (L. Palombi), astievano@tiscali.it (A. Stievano), mcmarazzi@gmail.com (M.C. Marazzi).

1. Introduction¹

Population ageing is associated with a rise in the prevalence of non-communicable diseases, increasing care needs and mortality (Prince et al., 2015). A strong shift from hospital-based to community-based care is suggested to address the burden of multi-morbidity and its effects on adverse healthcare outcomes

¹ FGE – Functional Geriatric Evaluation questionnaire

including hospitalisation and particularly the increasing demand for Long-term care (LTC) resulting from this demographic shift (Banerjee, 2014). However, how best to access community care services remains unclear. The current model of care in Italy is focused on established diseases and/or disability, despite the increasing need for preventive approaches that may slow functional decline for many older adults. There is interest in the role played by frailty in this process especially whether intervention can prevent or indeed reverse frailty.

Even if consensus on the exact definition is still lacking (Bergman et al., 2007; Fried et al., 2001; Gobbens, Luijckx, Wijnen-Sponselee, & Schols, 2007; Gobbens, Luijckx, Wijnen-Sponselee, & Schols, 2010; Rockwood, 2005), frailty is a syndrome associated with onset of functional decline in older people (Buckinx et al., 2015). Regardless of the definition applied or the assessment tool used, the costs to the individual and society are of concern. It is therefore essential for public health strategies to set up a model based on the assessment of frailty in order to prevent or delay functional decline in the older population. To achieve this, health agencies must determine the prevalence of frailty in community samples, work that is to be addressed in the planned ADVANTAGE study (#724099) as part of the European Commission's funded Joint Action on Frailty. What is known about the prevalence of frailty in community samples in Italy comes mainly from multinational surveys (Harttgen, Kowal, Strulik, Chatterji, & Vollmer, 2013). Assessing other methods of determining frailty is important so that the implementation of community-based strategies is tailored to regional practice. In Italy, assessment may best be implemented by Public Health Nurses (PHN) as in other European countries such as Ireland (O'Caomh et al., 2014; O'Caomh et al., 2015a), where PHNs screen for frailty using a selection of community-specific screening instruments (O'Caomh et al., 2015b).

The aim of this study was to determine the prevalence of frailty in older community-dwelling residents in the Lazio region of Italy and to describe factors associated with this condition in order to plan for adequate services. The proposed assessment model could be a reference for other regional services in Italy and inform the Joint Action on Frailty in Europe.

2. Methods

A cross-sectional study was carried out between January and December 2014. A multidimensional screening instrument, previously validated for frailty screening within the primary care level, the Functional Geriatric Evaluation (FGE) questionnaire (Grauer & Birnbom 1975; Scarcella, Liotta, Marazzi, Carhini, & Palombi, 2005), was administered to a sample of older community-dwelling residents in the Lazio region of Italy. The study was approved by the Independent Ethical Committee of the University of Rome "Tor Vergata". All participants signed informed consent to participate to the study; in case of patients with advanced mental impairment their closest relative signed assent. The questionnaire was administered by five nurses who underwent a two-day training course. These nurses also conducted a chart review of general practice notes that provided additional information on medical conditions. Based on the number of citizens over age 64 years residing in the Lazio region, for a precision of 3% with a 95% confidence limit, taking into account a refusal rate of 10%, we estimated 1400 citizens were required to power the study.

In order to generate a sample of citizens, representative of the elderly population in the Lazio Region, we utilized a selection process based on a per strata randomized design. Based on information available in the literature, municipalities of the Lazio region were classified according to four criteria, each of them divided in strata in order to avoid selection biases:

- 1) Population (strata: less than 20,000, 20–50,000, 50–100,000, more than 100,000);
- 2) Geography (plain, hill or mountainous regions);
- 3) Dependency-index (less than 48%, 48–50%, more than 50%);
- 4) Socio-economic status (high, medium, low) (CENSIS, 2002; ISTAT 2011; Regione Lazio, 2015).

According to this classification, 12 municipalities were chosen as representative of the region: each municipality refers to one Local Health Authority (LHA) except for the city of Rome, which refers to 5 LHAs; in this case one of the five was chosen on the basis of the previous four criteria. For each municipality the number of older adults to be selected was defined to ensure representation of all strata.

The General Practitioners (GPs) to be involved in the study were identified through randomization of the LHA list. In order to reach a target of 1260 interviews a total number of 77 GPs were contacted of which 8 refused and 69 accepted participation in the study. A maximum of 25 patients per GP were chosen through randomization of the GP's list of patients over 64 years of age. Patients not residing at home were excluded from the selection process. After being selected, study candidates were contacted by phone by their GP in order to give initial consent to the interview that was administered in the GP's outpatient facility or at the patient's home if the patient was unable to travel.

The FGE questionnaire provides a multidimensional assessment linked to a bio-psycho-social definition of frailty. It contains four sections:

- a) Demographic information;
- b) Multidimensional evaluation (physical, mental and functional status, socio/economic resources, environment);
- c) A list of diseases affecting patients compiled by GPs;
- d) Basic Activities of Daily Living (BADL) (Katz, 1963) plus Instrumental Activities of Daily Living (IADL) (Lawton, 1969) to define the disability (moderate disability if the patient is not fully independent in performing IADL and severe disability if the patient is not fully independent in performing basic ADL).

Only section b contributes to the Final Score (FS), which ranges from –108 to 101. According to the FS the subject interviewed is classified through the Final Synthetic Score (FSS) as robust (FS > 50), frail (FS ≥ 10 but ≤ 50) or very frail (FS < 10) by the incidence of institutionalization or death, which is two and three times higher among frail and very frail individuals respectively, compared with robust individuals five years after the administration of the questionnaire (Scarcella et al., 2005)

Statistical analysis was performed using SPSS 20.0. After calculation of the prevalence of frail and very frail individuals, the association between the FSS and variables in the questionnaire that did not contribute to the FS were analyzed. Univariate and multivariate analysis was performed in order to identify the pattern of variables associated with a frail or very frail status (bivariate Spearman's correlations for the continuous variables or Chi-square on contingency tables for the categorical ones and forward stepwise multivariate logistic regression analysis with the FSS dichotomized into "frail" and "very frail" versus robust as the outcome variable). Finally, the variables that showed a statistically significant association with the FSS in the multivariate analysis were included in the final model described through a two-dimensional Multiple Correspondences Analysis (MCA) (Costa, Santos, Cunha, Cotter, & Sousa, 2013) MCA allows for the analysis of categorical or categorized variables encompassing more than two categorical variables. Results were interpreted based on the relative positions of the points and their distribution into a two-dimensional visual outcome. This technique allows the association

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