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## High feeding dependence prevalence in residents living in Italian nursing homes requires new policies: Findings from a regionally based cross-sectional study

Alvisa Palese<sup>a,\*</sup>, Luca Grassetto<sup>b</sup>, Davide Bandera<sup>a</sup>, Ranieri Zutton<sup>c</sup>, Barbara Ferrario<sup>c</sup>, Sandra Ponta<sup>c</sup>, Mark Hayter<sup>d</sup>, Roger Watson<sup>d</sup>

<sup>a</sup> Department of Medical Sciences, Udine University, Italy

<sup>b</sup> Department of Economics and Statistics, Udine University, Italy

<sup>c</sup> Welfare Unit, Friuli Venezia Giulia Region, Italy

<sup>d</sup> Faculty of Health Sciences, Hull University, UK

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### ABSTRACT

**Objectives:** An increased amount of functional dependence has been reported among residents living in nursing homes. Among others, feeding dependence is one of the most complex needs to satisfy: behind the attempt to personalise meals with individual preferences and clinical regimens, all residents require help at the same moment and for long periods of time, three or more times a day. With the intent of debating policy implications, the aims of this study were to advance the knowledge in the field of feeding dependence prevalence and predictors in Italy, a country where life expectancy is among the highest in the World.

**Method:** A large retrospective regionally-based study approaching all nursing homes ( $n = 105$ ) was performed in 2014; all residents ( $n = 10,900$ ) were eligible and those with a completed assessment recorded in the regional database and aged  $>65$  years ( $n = 8875$ ) were included.

**Results:** 1839 residents (20.7%) were in total need of help in feeding on a daily basis. At the multilevel analysis, predictors were moderate/severe dementia (OR 4.044, CI 95% 3.213–5.090); dysphagia (OR 4.003 CI 95% 3.155–5.079); pressure sores (OR 2.317 CI 95% 1.803–2.978); unintentional weight loss (OR 2.197 CI 95% 1.493–3.233); unsociability (OR 1.561 CI 95% 1.060–2.299); and clinical instability (OR 1.363 CI 95% 1.109–1.677).

**Conclusions:** The feeding dependence prevalence emerged seem to be unique compared to that documented at the international levels. Modifiable and unmodifiable predictors found require new policies regarding workforce skills-mix and shifts schedules; as well as alliances with families, associations and communities' stakeholders. According to the complexity of the resident profile emerged, staff education and training is also recommended.

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### 1. Introduction

Different predictors have been documented as affecting nursing home (NH) admissions among the elderly and dependence in more than three activities of daily living (ADLs) has been identified as the strongest [1,2]. Specifically, some early- (dressing and personal hygiene) and mid-loss ADLs (toileting, transferring and locomotion [3,4]) have been indicated as the strongest predictors of subsequent

NH placement [1]. By contrast, some late-loss ADLs such as eating [5] usually deteriorate in later stages of life, during the in-NH stay. At the individual level, dementia, other chronic diseases, geriatric syndrome, depression, and loneliness have been shown to affect self-feeding performance [6,7]. Moreover, at the NH level, poor care or mistreatments due to the lack of NH resources as well as NH size have been identified as predictors of excessive dependence [8], leading specifically to an increased need of assistance during meals.

Self-feeding partial or total dependence have been defined as failure in spoon-feeding, problems with manipulation of food in the mouth, adverse behaviour and food falling from the mouth [9,10]. At the individual level, feeding dependence may lead to malnu-

\* Corresponding author at: Nursing Science, Udine University, Viale Ungheria 20, 33100 Udine, Italy.

E-mail address: [alvisa.palese@uniud.it](mailto:alvisa.palese@uniud.it) (A. Palese).

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trition, dehydration, adverse events such as inhalation pneumonia and other complications associated with high 6-month mortality rates [11]. At the NH caregiver level, assisting an individual with feeding dependence represents one of the most challenging tasks: it requires a minimum participation of the individual (e.g. maintaining attention during mealtime, opening the mouth, swallowing), adequate time for assistance, a proper relationship between the dyad as well as an adequate environment [12]. Moreover, at the NH level, feeding dependence is also one of the most complex needs to satisfy: behind the attempt to personalise meals with individual preferences and clinical regimens, all residents require help at the same moment and for long periods of time, three or more times a day; conversely, other needs – such as transferring and bathing – can be prioritised at different times of the day. Therefore, feeding dependence prevalence, among other ADLs, should be continuously assessed, aiming at the early identification of trends requiring national and NH-level policies capable of addressing its complexity [13,14].

Different studies measuring the prevalence of NH residents with partial or total feeding dependence around the world have been published to date. Among the first studies performed in the eighties, 240 residents of a skilled US-nursing facility were included, and 32% were dependent in eating [15]; later, by involving 125 older adults living in three non-profit geriatric long-term care facilities in Brazil, around 14.6% were dependent in feeding [16]. In Spain, among 3921 residents living in 86 NHs, 373 residents in 23 NHs were selected and 60 (17.3%) were diagnosed with dysphagia and 50 (13.4%) with feeding difficulties [17]. In contrast, in 149 residents with dementia and living in long-term care facilities located in Seoul, 54.4% were in need of moderate or total assistance while eating [18]. In New Zealand, Boyd and colleagues [19], in their multiple cross-sectional study design evaluating functional decline in NH residents over 20 years, reported that the proportion of those highly dependent increased from 16% (1988) to 21% (2008); specifically, those residents requiring assistance in feeding were 35% and 25%, respectively. More recently, by including 199 residents living in US NHs, almost one-third of them had been more recently identified as needing help in eating and predictors were severe cognitive impairment and low physical capability [20].

The high variability in prevalence reported across the World is due to different factors: a) researchers considered different conceptual definitions of feeding dependence as well as using different instruments to measure this phenomenon; b) NHs with different missions and resident admission criteria were included, [21], thus influencing residents' needs of care as well as their length of stay (e.g., short vs. long NH stayers); moreover, c) studies have been performed in different years and in different National Health care System [22]. In recent years, residents have been more likely to be admitted to a NH in a worse condition than in the past. The increased presence of services in the community and the revision of eligibility criteria for NH admission in some countries have redesigned the residents' care needs. Residents admitted in NH are sicker and closer to death than community-dwelling people; only around 10–31% of newly admitted NH elders require minimal help in ADL tasks, while the remaining require greater assistance [23]. In this context, measuring functional decline in NH residents is more challenging due to the reported increased dependence at baseline, which is also a predictor of decline. Therefore, data available should be continuously updated, given that understanding functional changes in NH residents may affect different aspects of care: from staffing levels and skills-mix to staff education; from models of care delivery to preventive programmes aimed at intervening in cases of specific impairments and groups of at-risk residents.

Therefore, with a view of debating policy-making themes at the macro- and meso- levels, the aims of this study were to advance the knowledge in the field of feeding dependence preva-

lence and predictors in Italy, a country where life expectancy is among the highest in the World [24]. Two research questions were established: a) How many NH residents are totally and partially feeding-dependent and what is the profile of those residents totally dependent as compared to those partially or totally independent in feeding? and b) What factors predict feeding dependence in residents living in NHs?

## 2. Methods

### 2.1. Study design

A retrospective regionally-based study was performed on 2014. Findings are reported here according to The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines [25] and according to the Reporting of studies Conducted using Observational Routinely-collected Health Data (RECORD guidelines) [26].

### 2.2. Setting and participants

All residents living in each of the 105 existing NHs in Friuli Venezia Giulia in 2013 (Italy) with a total of beds of 10,900 (from 7 to 520) were eligible. The NH resident assessment was performed at the time of NH admission and every six months by trained Registered Nurses (RNs) using the Val.Graf tool [27] according to regional rules.

In the study there was included the last completed assessment for all NH residents aged >65 years as recorded in the regional database. Assessments performed at the NH admission, as well as those performed for short-stay residents (<6 months) discharged for death, hospital admission, or admission to another NH, with parenteral (via infusion) or enteral nutrition (via NGT or PEG) were all excluded.

A total of 10,900 residents were then eligible; those who did not receive any assessment, or who had received only one assessment performed at the time of admission, short stayers remaining less than 6 months in the NH (=1724, 15.8%), or those with enteral or parenteral nutrition (=301, 2.8%) were not included; therefore, the study's total population was 8875 residents (81.4%).

### 2.3. Variables, data sources and measures

Variables were classified at the resident and at the NH level; the end point was the self-feeding dependence as measured at the resident level, while explanatory variables were measured both at the resident and at the NH level as reported in Table 1.

Data were extracted from the regional database where the last assessment was recorded. Data were collected as following:

- data at the resident level were collected at the bedside by trained RNs through observation (e.g. pressure sores), interview (e.g. pain intensity) and nursing records (e.g. episodes of vomit) by considering as time reference the previous week. The nurse in charge of the assessment was responsible of the resident daily care. The assessment was performed by using the Val.Graf tool [74], developed in Italy in the early 1990s as a geriatric, multidimensional assessment instrument for evaluating functional, clinical, psychological and social conditions of residents living in NHs. In its residential form used for the purposes of this study, the tool comprises 99 items; its validity has been established and findings demonstrated that the tool is acceptable and comprehensive, requiring around 20 min to be completed; it has a coherent factorial structure (13 factors, with explained variance of 52.9%) and demonstrated a satisfactory concurrent validity with other measures (e.g., Katz index, Mini – Mental State Examination) as well as from adequate to excellent reliability in all dimensions [27].

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