

Frailty scales – their potential in interprofessional working with older people: a discussion paper

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New models of interprofessional working are continuously being proposed to address the burgeoning health and social care needs of older people with complex and long-term health conditions. Evaluations of the effectiveness of these models tend to focus on process measures rather than outcomes for the older person. This discussion paper argues that the concept of frailty, and measures based on it, may provide a more user-centred tool for the evaluation of interprofessional services – a tool that cuts across unidisciplinary preoccupations and definitions of effectiveness. Numerous frailty scales have been developed for case identification and stratification of risk of adverse outcomes. We suggest that they may also be particularly suitable for evaluating the effectiveness of interprofessional working with community-dwelling older people. Several exemplars of frailty scales that might serve this purpose are identified, and their potential contributions and limitations are discussed. Further work is required to establish which is the most suitable scales for this application. The development of an appropriate frailty scale could provide an opportunity for interprofessional debate about the forms of care and treatment that should be prioritised to improve the health and well-being of this population.

Keywords: Frailty; measurement; older people; community care; integrated working; discussion paper

INTRODUCTION

The care of people with long-term and complex conditions is a key concern for health and social care policy makers in developed countries across the world (Department of Health, 2001; Hofmarcher, Oxley, & Rusticelli, 2007). In England, about 30% of the population are living with such conditions, and they are estimated to account for 70% of the

total health and social care spent (Department of Health, 2010). In the United States, it is estimated that by 2050, the number of individuals using paid long-term care services will likely double from the 13 million using them in 2000 (U.S. Department of Health and Human Services, 2003). New models of care provision are constantly being trialled or implemented in an effort to deal more effectively with this ever-increasing demand (Lloyd & Wait, 2006).

The development of care for older people with complex needs living in the community is predicated on the assumption that increasing levels of organisational and professional collaboration will optimise service delivery for this group (Department of Health, 2010; Flaherty, 1987; Kodner, 2006). Interprofessional working, an approach to person-centred care through close collaboration between health and social care workers, is an example of this policy in practice (Hoffman, Rosenfield, Gilbert, & Oandasan, 2008). However, evaluations of the impact of such collaborative models of care have been disappointing. For example, a recent systematic review of controlled trials of integrated interventions targeting frail older people in several countries found that many outcomes did not favour the intervention over the control, and concluded that there was only limited evidence that co-ordinated and integrated care is beneficial (Eklund & Wilhelmson, 2009). Many of the outcome measures used in the trials were unvalidated. Studies of community partnership working often lack methodological rigour (El Ansari & Weiss, 2006), and a greater focus on outcomes for the older person as well as for service-providers is required. The problem for practitioners, researchers and those responsible for buying or commissioning services is that little is known about the impact of different collaborative models on users and patients, because of difficulties establishing a causal link between a way of working that involves multiple practitioners and

individual outcomes (Dowling, Powell, & Glendinning, 2004). Whilst it is accepted that new structured approaches are needed that recognise the existence and complexity of multi-morbidity among older people and encourage inter-professional working (Boult et al., 2008; Reuben, Roth, Kamberg, & Wenger, 2003; Smith & O'Dowd, 2007), these may still exclude important social determinants of health (Hudson, 2005).

At present, there appears to be little reference in the interprofessional literature to user outcomes in the evaluation of care for older people. Much evaluative work focuses on the education of practitioners (Reeves et al., 2010) or uses only process measures, such as record keeping and cross-agency coordination (Tucker et al., 2009). Limited attention has been given to person-specific outcomes in evaluations of services for older people (Eloranta, Welch, Arve, & Routasalo, 2010; Reed, Cook, Childs, & McCormack, 2005; Tucker et al., 2009), and they receive little consideration in tools developed specifically to assess interprofessional working. For example, the Integrated Team Monitoring & Assessment Readiness Tool, provided by the former English Care Standards Improvement Partnership (<http://www.csip.org.uk>) is exclusively process-oriented, addressing issues such as team purpose and working arrangements. The Creating Capable Teams Approach (Reed et al., 2005), which was commissioned by the English Department of Health, includes identification of service user and carer needs as part of the planning process, but does not specify any user outcomes by which the effectiveness of organisational changes might be measured. In fact, discussions of policy and practice in interprofessional care for older people tend to exclude the voices of older people altogether (Eloranta et al., 2010; Glendinning, 2003). Clearly, there is a need to translate the rhetoric of a user-focussed service into reality by considering the impact on the individual's health and wellbeing as a primary outcome measure in the evaluation of care for older people.

One way forward is to employ a multidimensional outcome that can encompass and quantify the complexity of an individual's situation, and that addresses both personal health and social dimensions. The concept of frailty allows for the use of such a composite measure. Frailty measures have been proposed as tools for case finding or treatment planning, but their potential for monitoring and evaluating interprofessional care remains relatively unexplored. Used for such purposes, frailty instruments may be of value to both practitioners and budget-holders. In this article, we describe some current issues in the definition and use of frailty measures, and discuss their potential in the context of interprofessional working with community-dwelling older people.

This article is not a review of frailty – several have already been published or are underway (Daniels, van Rossum, de Witte, & van den Heuvel, 2008; De Lepeleire, Iliffe, Mann, & Degryse, 2009; Hogan, MacKnight, & Bergman, 2003; Karunanathan, Wolfson, Bergman, Beland, & Hogan, 2009; Markle-Reid & Browne, 2003). Rather it is intended to encourage debate about the value of the

concept and its measurement in interprofessional working, and to identify issues that need to be addressed before frailty measures can be used for the evaluation of interprofessional care for older populations.

FRAILTY CONCEPTS AND MEASURES

Frailty has been defined as 'a precarious balance between the assets maintaining health and the deficits threatening it' (Rockwood, Fox, Stolee, Robertson, & Beattie, 1994). This implies that a change in one variable may initiate a chain reaction among others, leading to serious adverse consequences for the individual. The definition leaves open the identification of the key assets and deficits. In older people these may be manifold, and they may interact. Physical, cognitive, emotional and social factors become increasingly interdependent with age, influencing health and well-being in complex ways. The impacts of individual elements such as nutrition, cognition and social functioning become difficult to map, whereas in combination they can be predictive of important outcomes such as ill health, moves to care homes and death (Markle-Reid & Browne, 2003). If frailty is operationalised, it can provide a measure of their combined impact on the individual. Such a holistically defined measure has obvious appeal for use in interprofessional working.

Frailty may be conceptualised as a clinical syndrome, diagnosed by the presence of particular disorders and physical characteristics, or as a progressive state of dependency and vulnerability stemming from multiple sources and risks. The former models tend to describe frailty entirely or primarily in physical terms; the latter incorporate additional domains such as the psychological and social. This variation does not necessarily represent disagreement about the 'true' nature of frailty. Models may serve different purposes and capture different populations: a study applying several commonly-used frailty criteria to a single group of older people produced prevalence rates between 33% and 88% (van Iersel & Rikkert, 2006). It may be that the various models of frailty represent alternate pathways to adverse outcomes (Cigolle, Ofstedal, Tian, & Blaum, 2009).

The varying definitions of frailty have generated numerous instruments for its measurement. Almost all consider physical factors such as strength, balance, gait and mobility (Levers, Estabrooks, & Ross Kerr, 2006). The use of medications, the presence of specific disorders and functional performance are also commonly assessed. Instruments that focus only on the physical domain have been challenged, however, and a more comprehensive model has been advocated, including psychological, emotional, social, spiritual and environmental components (Levers et al., 2006; Markle-Reid & Browne, 2003). A recently-developed measure of 'social vulnerability' incorporates a comprehensive battery of personal and social factors such as ability to speak the first language of the surrounding population, attitude to the local neighbourhood and engagement in local groups and faith communities (Andrew, Mitnitski, &

Rockwood, 2008). The resulting index is associated with mortality, suggesting that such features may be important components or indicators of health status. It is unlikely that they are mere products or consequences of physical/biological deficits: in this index social vulnerability was found to be associated with a frailty index based primarily on physical factors, but was distinct from it.

Although the earlier dominance of biophysical markers in assessment instruments has been challenged, new models are still emerging with an exclusively or primarily physical focus (Pel-Littel, Schuurmans, Emmelot-Vonk, & Verhaar, 2009; Walston et al., 2006). This stance might be justified because several such scales have demonstrated predictive validity for adverse outcomes such as morbidity and – often portrayed as adverse but not necessarily so – moves to a care home. Uncertainty remains about which factors have most predictive significance, whether there are different forms of frailty with their own particular risk factors, and if there are still other factors that should be incorporated into the models (Walston, et al., 2006). An integrated model of frailty reflects the interprofessional working paradigm, which seeks to address the connectedness of multiple domains. Increasingly, frailty measures based on this broader conceptualisation are being developed.

The data collected by frailty instruments may overlap with that obtained by other tools such as the SF-36 Health Scale (Garratt, Ruta, Abdalla, Buckingham, & Russell, 1993) and the Barthel Functional Index (Wade & Collin, 1988), which are more familiar in healthcare than in social care. However, many of these scales were not developed specifically for use with older people or in community settings, and the reliability of some of them for these applications has been questioned (Brazier, Walters, Nicholl, & Kohler, 1996; Sainsbury, Seebass, Bansal, & Young, 2005). Several frailty tools, on the other hand, have been developed specifically for use with older people in community settings, and focus on issues that are particularly pertinent to them.

Numerous instruments have been developed for the measurement of frailty. Their structures and processes of application vary according to the concept of frailty adopted and the purposes for which they are intended. These include case identification, stratification of risk and monitoring change (De Lepeleire, et al., 2009). So, for example, an instrument commonly cited in the healthcare literature is the Frailty Phenotype (Fried et al., 2001), which conceptualises frailty as a reduction in physical capacity and reserves, causing vulnerability to adverse outcomes. It uses purely physical markers such as weight loss and grip strength. The measure has been found predictive of a variety of outcomes, such as increasing disability and dependence (Avila-Funes et al., 2008) and incidence of thromboembolism (Folsom et al., 2007), and so can be used to predict support needs. Another measure, the Frailty Outcome Prognosis, uses a more multidimensional conceptualisation of frailty, and addresses socio-demographic, functional and cognitive domains as well as medical and physical factors (Ravaglia et al., 2008). It is predictive of mortality, fractures, hospital admissions and worsening disability. Its developers

proposed that it could be used as an easy-to-administer but powerful indicator of health status when a more comprehensive geriatric assessment is impractical (Ravaglia et al., 2008).

APPLYING FRAILTY SCALES IN THE INTERPROFESSIONAL CONTEXT

The concept of frailty and its measurement has unexplored potential in interprofessional working with community-dwelling older people. Frailty instruments may assist in the identification of individuals requiring complex care; they can provide a motivator for different health and social care practitioners to co-ordinate their goals and care plans. In particular, they can be used to evaluate care according to person-centred outcomes, rather than focussing exclusively on process-oriented variables, such as shared communication systems, which may be necessary but insufficient to promote health and well-being. To date, little attention has been given to their application in this context, and so the following observations are proposals rather than descriptions of current practice.

Where frailty data are available for community-dwelling older people in a particular locality, joint commissioners or purchasers of services – such as local government and health service partnerships – could use it to identify high-risk groups and prioritise interprofessional projects. So, for example, teams of social workers, nurses and physical therapists could be given a specific remit to address groups with high frailty scores. Interprofessional teams may use frailty scores for the triage of referrals, assigning priority to those identified as at higher risk by their scores.

Since many elements of frailty measures – such as levels of medication, physical activity and community engagement – may be inter-dependent, the frailty profile of an individual can encourage the team practitioners to joint discussion and planning of interventions. Case conferences involving the older person can help set goals that are informed by the high scoring elements of frailty. The particular value of using a single instrument is that, if well-designed, it will provide a concise, person-centred, commonly understood framework for these discussions. Frailty instruments with predictive validity will provide data that can confidently be used to inform prioritisation of emerging goals and proposed interventions. This may be particularly important where resources are constrained, or competed for by the different professions represented on the team. As frailty research generates new insights into the relationships between different elements of frailty – physical, psychological and social – practitioners may be better informed about the causal links and cascades that precipitate adverse events. Focussed joint working may be used to target those interactions known to be key to these cascades.

Most frailty instruments are designed to be administered by a single practitioner. In some cases this may be a geriatrician, but in others the assessment can be conducted by a non-specialist (see below for examples). Where a limited number of specialist skills are required, for example

in assessing cognition or grip strength, members of an interprofessional team could train each other for these specific tasks. This would encourage focussed dialogue between the professions and deepen the appreciation of each others' concerns. Joint assessments using the frailty instrument would serve a similar purpose. In any case, conducting a focussed frailty assessment could reduce the number of discipline-specific measures required in each case, or identify where such measures were particularly appropriate. It might be part of a common assessment process that could be less demanding of the older person and practitioners' time.

Some frailty instruments have the potential to monitor the effects of interventions and to chart significant changes in the individual's well-being and vulnerability. These have potential as evaluative tools in interprofessional working. This application is addressed in more detail in the following section.

FRAILITY SCALES FOR THE EVALUATION OF INTERPROFESSIONAL WORKING

Frailty can be seen as a progressive characteristic and one that may be slowed, interrupted or even reversed (De Lepeleire et al., 2009; Gill, Gahbauer, Allore, & Han, 2006). Measures using this dynamic model may be employed to monitor an individual's frailty status and identify significant changes that are occurring over time, so providing data that can assist decision-making and care-planning. They can also be employed as outcome measures to evaluate care at individual, group and organisational levels. Where different structures and processes of interprofessional working are being implemented with particular populations of older people, frailty scoring systems may be used to judge and compare their effectiveness. A number of instruments have been developed that may have particular value in this regard:

- The Clinical Global Impression of Change in Physical Frailty (Studenski et al., 2004) focuses, as its name suggests, on physical factors, but also addresses self-perceived health, emotional status and social interactions. It was specifically designed to measure changes in health status and quantifies the subjective judgement of a clinician following a comprehensive assessment. It conceptualises psychosocial status as a consequence of physical frailty, and this may be challenged, but need not affect implementation of the scoring system.
- The Edmonton Frailty Scale (Rolfson, Majumdar, Tsuyuki, Tahir, & Rockwood, 2006) was constructed for use by a non-specialist as a simple screening tool for frailty: reaching a defined score threshold is deemed a referral criterion for a comprehensive geriatric assessment. The originators of the scale proposed that it could also be used as a measure of change in health status and well-being, although it does not yet appear to have been used for this purpose.
- The Dynamic Frailty Scale (Puts, Lips, Dorly, & Deeg, 2005), developed to identify those with moderate levels of

frailty, is conceptualised as an evolving state of vulnerability to adverse outcomes, and is operationalised in physical, cognitive and affective terms. Its developers proposed that it could be useful in identifying moderately frail individuals whose risk of admission to a nursing home may be reduced by appropriate interventions. Effective interventions should therefore be indicated by score reductions.

Although these examples share a model of frailty as a characteristic amenable to change by intervention, they draw on different theoretical constructs and measure it in quite different ways. Instruments that address multiple domains are more likely to be of relevance to interprofessional working, particularly where they involve both health and social care practitioners. Some measures are based entirely on assessments and opinions provided by a practitioner; others draw upon responses by the individual being assessed, or may use multiple sources of information. Whilst scoring systems that rely on professional opinion alone may take the patient's/user's experience and views into account, a scale that incorporates both objective clinical and subjective user-rated elements sits most comfortably in a person-centred paradigm of care.

A frailty scale with proven predictive validity for significant changes in the individual's status – such as their sense of well-being or the occurrence of adverse events – has clear utility as an outcome measure for the evaluation of interventions. In trials comparing different models of interprofessional working, such scales could be used as eligibility criteria to ensure that participants are similar at baseline in terms of likelihood of particular outcomes. Parallel arm trials with assessments at multiple time points could be used to compare effectiveness in reducing risk and charting how quickly such reductions occur. The challenges of conducting and analysing multimodal interventions with clustered participants would be the same as those in evaluating other complex management approaches, but strategies exist to optimise analytical power in these contexts. Broad adoption of particular frailty scales with proven inter-rater reliability would facilitate the meta-analysis of different trials, so providing more convincing evidence about the relative effectiveness of different examples of interprofessional working.

CHALLENGES IN THE USE OF FRAILITY SCALES

Several issues must be addressed before frailty scales can be used reliably for the evaluation of interprofessional working. In particular, there is a need for consensus on the constituent factors that must be included in the measure. A suitable instrument will capture a situation that has meaning and relevance for a range of professionals, and do so succinctly. Determining the minimum necessary dataset, and whether particular combinations of elements are reliable predictors of outcome, may enable instruments to be developed that are powerful, discriminatory and feasible in practice. Although the concept of frailty is

gaining currency in healthcare settings and by healthcare practitioners, in the UK context social care practitioners work within other paradigms such as opportunities and inclusion (Knapp et al., 2005). Models and measures of frailty may address these concepts using other terminology, but ongoing debate and collaboration between those involved in health and social care are required to develop a shared conceptualisation and idiom.

Standard protocols for the creation of health measurement scales appear rarely to have been adopted in the development of frailty instruments, and their validity, reliability and responsiveness need to be formally established. It is unusual for frail older people to be involved in the construction of frailty models or the assessment instruments arising from them. Where they are consulted, their views do not necessarily accord with those of clinicians. In one consultation involving both clinicians and healthcare users in the construction of a frailty instrument (Studenski et al., 2004), patients and families prioritised emotional and social issues most highly, whereas clinicians gave equal weight to 'intrinsic' markers – such as strength and balance – and 'consequences' – such as functional independence and psychosocial status. This biomedical model appears to marginalise what older people believe by conceptualising social roles and psychological functioning as arising from physical frailty, rather than as components of frailty in their own right.

In a recent study, 25 older people were asked about their own conceptions of frailty (Puts, Shekary, Widdershoven, Heldens, & Deeg, 2009). Similar dimensions to those employed in existing models emerged, but different or additional markers were used to operationalise them. In the physical domain, appearance and reliance on assistive technology were seen as important indicators. Fear of falling or of crime was identified in the psychological domain, and loneliness and not being able to visit people were suggested as social markers. Several people who had been classified as frail by a validated instrument did not see themselves as such, and no mention was made by respondents of the physical markers used in that instrument. It appears that the clinicians and patients had quite different understandings of frailty (though both might have significant implications for health and social care). More personal experiential markers may need to be incorporated into frailty instruments.

Models of frailty have tended to produce measures that focus on characteristics of the individual, and this approach has been criticised because it does not take account of wider contextual factors that may also impact upon vulnerability (Markle-Reid & Browne, 2003). In fact, vulnerability may be a more appropriate term than frailty to describe a susceptibility to outcome that is dependent on both individual and environmental features. Housing and transport, as well as broader factors such as social attitudes and cultural norms, may influence the susceptibility of the individual to declining health (Ory, Kinney Hoffman, Hawkins, Sanner, & Mockenhaupt, 2003). Models and measures of frailty/vulnerability have yet to consider these

possibilities, and viable ways to quantify and incorporate contextual factors into measures are required.

At present, debate about the conceptualisation, measurement and application of frailty scales is largely being conducted within healthcare settings and by health researchers. In the UK context at least, the activities of many social care practitioners are governed by other influences, such as need and risk. Embedding frailty within such needs assessments would require collaborative work and piloting of tools that emerge. The language of social care outcomes for adults may also provide opportunities to debate the potential of frailty concepts, but it is in social care that the most sustained critiques of frailty as a term are to be found, with some (Knapp et al., 2005) arguing that greater emphasis should now be placed on needs defined in terms of opportunities and inclusion. Hence, the discussion needs to incorporate the different perspectives of social and health care, as well as those of older people and their carers. Out of such dialogue, a model and measure of frailty may emerge that both reflects an interdisciplinary approach and can be used to promote and evaluate it.

CONCLUSIONS

The concept of frailty is receiving increasing attention in the healthcare literature. Frailty instruments can address multiple interacting domains, draw upon the expertise of practitioners and the experiences of older people, and some are capable of registering changes in an individual's vulnerability to adverse outcomes. Hence, they have considerable potential in the identification, risk stratification and care management of older people with complex conditions living in the community. In our view they may also prove invaluable in assessing the impact of inter-professional working with this group. Research and practice can inform the validation of existing measures and the development of new ones for this purpose. Joint exploration of a holistic and integrated model of frailty, and development of responsive measures based upon it, have the potential to draw the different disciplines in health and social care into a productive debate about care needs and service priorities. The dividend of such efforts may be user-centred models and measures of frailty/vulnerability that are of particular value where multiple factors producing health and well-being interact, and where professionals from different organisations and disciplines are working together with older people and carers.

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