Conceptualizations of frailty in relation to older adults

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Aim. The aim of this article is to discuss the concept of frailty and its adequacy in identifying and describing older adults as frail.

Background. Despite the dramatic increase in use of the term 'frailty' over the past two decades, there is a lack of consensus in the literature about its meaning and use, and no clear conceptual guidelines for identifying and describing older adults as frail. Differences in theoretical perspectives will influence policy decisions regarding eligibility for, and allocation of, scarce health care resources among older adults.

Method. The article presents a literature review and synthesis of definitions and conceptual models of frailty in relation to older adults. The first part of the paper is a summary of the synonyms, antonyms and definitions of the term frailty. The second part is a critical evaluation of conceptual models of frailty. Six conceptual models are analysed on the basis of four main categories of assumptions about: (1) the nature of scientific knowledge; (2) the level of analysis; (3) the ageing process; (4) the stability of frailty. The implications of these are discussed in relation to clinical practice, policy and research.

Conclusion. The review gives guidelines for a new theoretical approach to the concept of frailty in older adults: (1) it must be a multidimensional concept that considers the complex interplay of physical, psychological, social and environmental factors; (2) the concept must not be age-related, suggesting a negative and stereotypical view of ageing; (3) the concept must take into account an individual's context and incorporate subjective perceptions; (4) the concept must take into account the contribution of both individual and environmental factors.

Keywords: frail, older people, models, theoretical, literature review, conceptual model, clinical, policy, research, nursing

Introduction

With increasing age, individuals are more likely to experience frailty and to report decreased well-being (Rockwood *et al.* 1994, Fried & Guralnik 1997, Hebert 1997, Canadian Study of Health and Aging 1999). In a recent report in which frailty was defined as impairment in one or more aspects of the activities of daily living or cognitive impairment or poor self-rated health, the estimated prevalence of frailty was 27% (Stolee & Rockwood 1981). Interacting physical, psychological and social factors determine the needs of frail older people (Bergman *et al.* 1997). These characteristics put frail elders at risk for increasing morbidity, acute hospital and long-term care use and death (Buchner & Wagner 1992, Bortz 1993, Salive *et al.* 1993, Schulz & Williamson 1993, Galanos *et al.* 1994, Wallace *et al.* 1995). The challenge for

developed nations is how to maintain and improve health services for the growing frail older population, while limiting the growth of health care expenditures.

While policymakers, practitioners and researchers in many countries, including North America, have acknowledged that frailty is a major public health problem, there is substantial disagreement about definitions of frailty and the extent and scope of public and private responsibility in the prevention and management of frailty. This disparity in perspectives is reflected in the broad and fragmented body of literature that has addressed the concept in relation to older adults (Canadian Study of Health and Aging 1999). Despite the dramatic increase in use of the term 'frailty' over the past two decades (Rockwood *et al.* 1994, Campbell & Buchner 1997), there is a lack of consensus in the literature about its meaning and use, and no clear conceptual guidelines for establishing criteria to describe older adults as frail (Rockwood *et al.* 1994, Brown *et al.* 1995, Campbell & Buchner 1997, Canadian Study of Health and Aging 1999). Is frailty a disease? Is it a part of ageing? What does frailty look like? How is it defined, framed, and understood? What prompts a clinician to apply this label to some older adults and not others (Gealey 1997)? Finally, exactly how frail is frail (Woodhouse & O'Mahoney 1997)?

A first step in addressing the problem of frailty is to understand better how to identify those who are frail (MacKnight 1999). Eligibility for health care services as well as decisions regarding the ability of an individual to remain in the community is often based on a definition of frailty (Cox 1993). However, the components of frailty have not been sufficiently defined to identify a population at risk or in need of proactive interventions (Campbell & Buchner 1997). A common meaning could inform policy decisions on allocation of, and eligibility for, health care resources among the older population. A common, yet comprehensive meaning would also legitimize and provide insight into the unique and complex needs of frail elders, and promote care better aimed at meeting those needs (Cox 1993).

This paper presents a literature review and synthesis of the existing definitions and conceptual models in the literature for understanding the concept of frailty among older adults. The first part of the paper is a summary of the synonyms, antonyms and definitions of the term in the literature. The second part is a critical evaluation of the conceptual models of frailty in the literature and identification of their underlying assumptions that limits their usefulness for informing clinical practice, policy and research. The paper concludes with recommendations for policy, practice, and research.

Search strategy

A variety of search strategies were used in order to complete a comprehensive and systematic review of the literature. These included computer searches by subject heading, text word and author, e-mail contacts with selected authors and hand searches of texts and journals. Multiple computerized bibliographic databases were used including Medline, CINAHL, Social Sciences Index, PsycINFO, Sociological Abstracts, Ageline, and Health Star to access publications from 1985 to 2000. Combinations of the following subject headings and text words were used: 'frail' (and synonyms: 'frail elderly', 'frail elder', and 'frailty') AND 'conceptual framework' (and synonyms: 'models', 'models, theoretical', and 'theory'). All subject headings were exploded in order to include all possible subheadings. The search was limited to articles in English. General textbooks dealing with gerontology were reviewed for definitions and/or conceptual models of frailty. Reference lists of articles were hand searched to find relevant citations.

The synonyms, antonyms and definitions of frailty included in this review were derived from a review of the abstracts of: (1) all articles published in 1999 that listed 'frail' in their title, and (2) a random selection of articles published from 1985 to 1998 that listed 'frail' in their title. The abstracts of the articles were reviewed for a definition of frailty or criteria for applying this label. Several of the articles were reviewed in their entirety for definitions and criteria for applying the term 'frail'. The conceptual models of frailty that were included in the review met two criteria. First, the model consisted of a set of global concepts and propositions. Secondly, it addressed the concepts of person, environment and health (Fawcett 1989).

Synonyms, antonyms and definitions

The term frailty has been used in a variety of ways that perhaps fit with the perspectives and backgrounds of the various authors. For example, Brown *et al.* (1995, p. 97) state that 'When we use the term frail, we do not usually do so in relation to its opposite, but to understand the term fully it is important to do so'. Therefore, the antonyms as well as synonyms of frailty were examined (see Table 1). The main themes of this review were that frailty has been considered when there are indications of: (1) functional impairment and dependence on others for activities of daily living that threaten the ability of a person to live independently in the community, (2) poor physical health, such as chronic illness or acute illnesses, (3) disability, (4) vulnerability or lack of strength and resilience, (5) poor mental health functioning; for example, cognitive impairment or depression, (6)

Table 1 Synonyms, antonyms, and definitions of frailty in the literature

Synonyms
Failure to thrive (Berkman *et al.* 1989)
Biologically old (Rockwood *et al.* 1994)
Wasting syndrome common in people of advanced age (Walston & Fried 1999)
Chronically dependent in a variety of ways (Tennstedt *et al.* 1990)
Functional disability (Buchner & Wagner 1992, Fried 1994, Hallfors *et al.* 1994)
Functional dependency (Leutz *et al.* 1992, Cox 1993)
Decreased ability to respond to stressful situations (Jarrett *et al.* 1995)
Fragile, delicate, brittle, tender, easily disturbed (Ebersole & Hess 1998)
Functionally vulnerable (Morris *et al.* 1984, Tennstedt *et al.* 1990)
Chronic illness and disability (Pawlson 1988, MacAdam *et al.* 1989, Lawton 1991)
Feebleness and general vulnerability (Verbrugge 1991)
Antonyms
Independence vs. autonomy (Becker 1994)
Chronologically old vs. biologically old (often called frail) (Rockwood *et al.* 1994)
Vitality vs. frailty (Bortz 1993)
Well elderly vs. frail elderly (Rockwood *et al.* 1994)
Vigorous vs. frail (Speechley & Tinetti 1991)
Hardy vs. frail (Raphael *et al.* 1995)
Robustness vs. feebleness and general vulnerability (Verbrugge 1991)
Definitions
Aging (Burnside 1990, Hirdes *et al.* 1994, Walston & Fried 1999)
Reduced physiological reserves (Bortz 1993)
Decreased muscle strength, mobility and balance (Hadley *et al.* 1993, Ory *et al.* 1993, Kline 1995, Dayhoff & Suhrheinrich 1998)
Decreased strength, flexibility, cardiovascular endurance and body composition (Wolf *et al.* 1996)
Compromised homeostatic mechanisms (Carlson *et al.* 1998)
Feebleness, delicately constituted, vulnerable or lack of resilience (Buchner & Wagner 1992)
Disability (Williams *et al.* 1989, Lawton 1991, Schulz & Williamson 1993, Hallfors *et al.* 1994)
Inactivity combined with weight loss (Chin A Paw *et al.* 1999)
Functional impairment and dependence in activities of daily living (Minister for Senior Citizens Affairs; Seniors Secretariat 1985, Winograd *et al.* 1988, Chichin 1989, MacAdam *et al.* 1989, Tennstedt *et al.* 1990, Winograd *et al.* 1991, Cox 1993, Schulz & Williamson 1993, Rockwood *et al.* 1994, Andersen & Johnson 1996)
Chronic and disabling illness (MacAdam *et al.* 1989, Lawton 1991, Winograd *et al.* 1991)
Acute illnesses such as confusion, falls, immobility, incontinence, and pressure sores (Winograd *et al.* 1988, Coleman *et al.* 1999)
Poor mental health functioning, such as cognitive impairment (Burnside 1990) and depression (Tennstedt *et al.* 1992, McDougall & Balyer 1998)
Need for formal or informal assistance with personal care or household tasks (Kennie & Warshaw 1989, Hall *et al.* 1992, Guralnik & Simonsick 1993, Payette *et al.* 1999)
Specialized geriatric intervention (Winograd *et al.* 1988, Clayman 1990), and long-term (nursing home) care (Gruenberg *et al.* 1990)
Mathematical modelling of morbidity and mortality to denote a latent variable associated with extent of risk (Vaupel *et al.* 1979)

requiring formal, informal, or long-term care to meet basic needs, and (7) simply old age. In addition, demographers use the term frailty in mathematical modelling of morbidity and mortality to denote a latent variable associated with extent of risk (Vaupel *et al.* 1979). These examples predominantly reflect a biomedical perspective, equating frailty with ageing, disease, decline, loss and dependence on others.

Other authors have combined these criteria in their description of frail, suggesting that it is multi-dimensional. That is, an individual would be classified as frail if they met

any of these or some combination of these aforementioned clinical criteria (Winograd *et al.* 1991, Guralnik & Simonsick 1993, Wolf *et al.* 1996, Bergman *et al.* 1997, Brody *et al.* 1997, Coleman *et al.* 1999, Gagnon *et al.* 1999). Guralnik and Simonsick (1993), for example, described frailty as poor functioning in physical, cognitive, emotional, sensory or social functioning.

While these authors project a multi-dimensional view of frailty, others have described it as uni-dimensional. For example, it has been subdivided into types including 'medical frailty', 'functional frailty', 'mental frailty', and 'physical frailty' (Jones 1990, McNamee *et al.* 1999), implying that there is just one type of characteristic by which an individual is evaluated for frailty. In summary, the review suggests that many factors may contribute to frailty; however, these have not been related to a common meaning for the term. This lack of common meaning makes its actual prevalence uncertain (Rockwood *et al.* 1994, Hamerman 1999).

Critical evaluation of conceptual models of frailty

A total of six conceptual models of frailty were identified in the literature as meeting the predefined selection criteria (Buchner & Wagner 1992, Bortz 1993, Kaufman 1994, Rockwood *et al.* 1994, Brown *et al.* 1995, Raphael *et al.* 1995, Campbell & Buchner 1997, Walston & Fried 1999) (see Table 2). The following definition of a conceptual model was used for the review:

> The term conceptual model, and synonymous terms such as conceptual framework, conceptual system, paradigm, and disciplinary matrix, refer to global ideas about the individuals, groups, situations, and events of interest to a discipline. Conceptual models are made up of concepts, which are words describing mental images of phenomena, and propositions, which are statements about the concepts. A conceptual model, therefore, is defined as a set of concepts and the propositions that integrate them into a meaningful configuration. (Fawcett 1989, p. 2)

An abundance of features have been used in the literature to describe conceptual models. For the purposes of the review, many of these features were incorporated (Walker & Avant 1983, Fawcett 1989, Lofland & Lofland 1995) into the development of five questions, which guided a critical evaluation of the conceptual models:

- What is the origin and historical evolution of the model?
- What are the dimensions of frailty in the model?
- What is the role of the environment and how has it been defined?
- What is the underlying cause of frailty?
- What types of processes are involved in the model?

This resulted in identification of four main categories of assumptions within the models: (1) philosophical assumptions about the nature of scientific knowledge, (2) philosophical assumptions about the level of analysis, (3) assumptions about the ageing process, and (4) assumptions about the stability of frailty. Identification of assumptions (explicit and implicit) provides important information about the author's values, beliefs and philosophical perspective (Fawcett 1989). Analysis of the underlying assumptions and their implications will provide an understanding of the strengths and limitations of the existing conceptual models for informing clinical practice, policy and research and suggest areas for future development.

Philosophical assumptions about the nature of scientific knowledge

Every scientific model is tied to some philosophical framework, which presents a distinct and formalized account of the nature and development of scientific knowledge (Whall 1989, Guba & Lincoln 1994). Differences in theoretical perspectives will influence how frailty is defined and framed which will, in turn, inform policy decisions on eligibility for, and allocation of, scarce health care resources. With the exception of two conceptual models of frailty (Kaufman 1994, Brown *et al.* 1995), instrumental definitions and conceptual models that reflect a postpositivist, predominantly biomedical perspective of frailty (Buchner & Wagner 1992, Bortz 1993, Schulz & Williamson 1993, Fried 1994, Rockwood *et al.* 1994, Raphael *et al.* 1995, Campbell & Buchner 1997, Walston & Fried 1999), dominate the literature.

Consistent with the tenets of postpositivism, the basic posture of these models is mechanistic, reductionistic and deterministic (Guba & Lincoln 1994). This perspective is reflected in the way in which frailty has been conceptualized. First, the models support the view that frailty is uni-dimensional and is characterized by functional losses that influence the capacity for independence in daily living (Buchner & Wagner 1992, Bortz 1993, Fried 1994, Rockwood *et al.* 1994, Raphael *et al.* 1995, Campbell & Buchner 1997, Walston & Fried 1999). Buchner and Wagner (1992) define frail elders as those who are unable to fulfill social roles and perform activities of daily living. Rockwood *et al.* (1994) define the group as those for whom the deficits outweigh the assets, so that they can no longer maintain independence in the community. Raphael *et al.* (1995) state that frailty occurs when there is diminished ability to carry out the important practical and social activities of daily living. These examples suggest that dependence on others is a sufficient condition for frailty.

Table 2 Conceptual models of frailty

Conceptual models	Dimensions of frailty	Role and definition of the environment	Underlying cause of frailty	Types of processes
Frailty and disability Medical sciences original model: Buchner and Wagner (1992) expanded model: Campbell and Buchner (1997)	Physiological dimensions of: neurologic control mechanical performance energy metabolism musculoskeletal function, aerobic capacity, cognitive/neuro state nutritional state	Physical environment: external stressors that can precipitate frailty but are also essential for maintenance of function	Frailty results from a loss of a person's capability to withstand environmental stressors related to diminished physiologic reserves beyond a *threshold limit*. Reserve capacities reduced by disease, disuse, illness and age	Frailty is a precursor to disability (Buchner & Wagner 1992) or unstable disability (Campbell & Buchner 1997) The process of becoming frail consists of a *series of episodic, progressive and irreversible losses*
The physics of frailty Physical sciences original model: Bortz (1993)	Pathology of frailty: structural (tissue) integrity	Physical environment: external stressors that can precipitate frailty but are also essential for maintenance of function	Frailty results from the dysfunction of tissue secondary to non-optimal energy flow because of disuse, aging and disease leading to a *threshold* loss of physiologic function	Frailty is defined as opposite to vitality along a *continuum* Frailty is reversible through the reestablishment of optimal energy flow
The cycle of frailty Medical sciences original model: Fried (1994), Walston and Fried (1999)	Physiological dimensions of: Loss of skeletal muscle (sarcopenia) neuroendocrine dysregulation immune dysfunction	Physical environment: external stressors that can trigger or accelerate the underlying cycle of frailty	Disease, immobility, depression, and medications cause a decline in physiologic function and reserve across multiple systems. A person is considered frail if they have physiologic declines beyond a predefined *threshold limit*	Frailty is defined as a *cycle* – a process of declining energetics, including muscle mass loss, falling metabolic rate, declining strength, energy expenditure and mobility
Dynamic model of frailty Medical sciences original model: Rockwood *et al.* (1994)	*Assets*: health, functional capacity, positive attitude toward health, other resources *Deficits*: ill health, disability, dependence on others for ADL, burden on caregiver	Social environment: immediate and proximal and includes caregiver and other social and environmental resources Physical environment, e.g. health, functional capacity	The frail elderly are those persons for whom the deficits outweigh the assets, so these people can no longer maintain their independence in the community	*Dynamic process with interacting factors* resulting in different degrees of frailty characterized by different levels of dependence on others
Frailty as a social construction Behavioural sciences: Raphael *et al.* (1995)	*Personal factors*: cognitive factors, physical factors, psychological factors, spiritual factors *Environmental factors*: the importance of practical and social activities of daily living is defined by the individual	Environmental factors are both proximal and distal: financial, interpersonal, living situation, institutional factors	Frailty occurs when there is diminished ability to carry out the important practical and social activities of daily living. Reserve capacity contributes to a person's position on the frail-hardiness continuum, but, by itself is sufficient to determine frailty	Frailty is defined as opposite to hardiness along a *continuum*. The position on the continuum depends on the complex interaction among personal and environmental factors
The social construction of frailty Medical anthropology: original model: Kaufman (1994)	Frailty is socially produced and is a lived experience Frailty reflects a societal view of aging as a battle between independence and dependence	Environment includes family, health care system and society	Frailty is socially produced through the interaction of older adults, their caregivers and their health providers	Frailty is a *quality* and a *dynamic adaptational process* on the part of elderly persons, families, and health care personnel

Secondly, the models suggest that frailty can be reduced to specific and predetermined components that can be quantified and objectively measured in order to predict frailty in an individual (Buchner & Wagner 1992, Bortz 1993, Fried 1994, Rockwood *et al.* 1994, Campbell & Buchner 1997, Walston & Fried 1999). These factors are predominantly biomedical in nature and influence the physiological capacity of an individual to withstand stress from the physical environment (Buchner & Wagner 1992, Bortz 1993, Fried 1994, Campbell & Buchner 1997, Walston & Fried 1999), which, in turn, influences their capacity for independence (Rockwood *et al.* 1994).

The conceptual model of frailty and disability, for example, defines frailty as consisting of the physiological dimensions of musculoskeletal function, aerobic capacity, cognitive and nutritional states (Buchner & Wagner 1992, Campbell & Buchner 1997). In this model the authors state that, through measurement of the components of frailty, an overall score can be derived and areas of compromised reserve identified that can predict frailty and subsequent disability. This reflects a postpositivist philosophy which states that, through knowledge of the parts, which are objectively defined and quantified, knowledge of the whole will be accumulated (Haase & Myers 1988). Implicit in these examples is that frailty has been interpreted within an objective context, which assumes homogeneity and uniformity among individuals.

The models are consistent in their inclusion of the concept of reserve capacity. That is, the ability of an individual to withstand stressors from the environment is a function of their individual threshold limit or reserve capacity, beyond which an individual becomes frail (Buchner & Wagner 1992, Bortz 1993, Fried 1994, Rockwood *et al.* 1994, Campbell & Buchner 1997). However, the concept of threshold has been described as predominantly physical in nature, implying that frailty is more a reflection of a disease or physiological state than a statement of need. In one model, Raphael *et al.* (1995) state that threshold is defined by the complex interplay of biological, psychological and social factors, and not just by physical factors. However, the concept of threshold in this model is associated with the physical aspects of ageing (Raphael *et al.* 1995).

While the majority of models have viewed frailty as including primarily biomedical and objective dimensions (Buchner & Wagner 1992, Bortz 1993, Fried 1994, Campbell & Buchner 1997, Walston & Fried 1999), others have gone beyond this by incorporating psychological and/or social dimensions (Raphael *et al.* 1995). Although Raphael *et al.* (1995) and Brown *et al.* (1995) describe frailty as a social construction, they measure it using an objective and quantitative approach. In their model, they explicitly state that a person can be frail in one aspect of life but not another, which again reflects a mechanistic and reductionist approach.

Thirdly, with the exception of one model (Raphael *et al.* 1995), the components of frailty have been predominantly viewed in isolation. Rockwood *et al.* (1994), for example, identified assets and deficits and looked at how each of these dimensions individually can predict death, use of acute care services, and long-term care services. In general, the models do not directly address how various physical, psychological, social and environmental factors, in combination, can predict frailty.

While this reductionist and uni-dimensional view may be useful to clinicians, it may not be a true reflection of the lived experience and cannot capture the complexity and uniqueness of frailty for each individual (Becker 1994, Kaufman 1994). The models assume homogeneity, uniformity and predictability based on objective characteristics. However, studies of subjective health assessments suggest that people's perceptions are more important indicators of health outcomes than objective circumstances (Brubaker 1990). Becker (1994) reported that objective measures of frailty were not consistent with the lived experience or subjective perception of functional ability. Similarly, Minkler (1990) stated that respondents never used the word 'frail' to describe their health or functional ability, despite the fact that they were defined by health professionals as being frail.

Philosophical assumptions about level of analysis

'The micro vs. macro theorizing dimension reflects a long-standing tension in social gerontology between the social psychological and social structural levels of analysis', according to Marshall (1995, p. 14). The micro-level of analysis is concerned with the individual alone whereas the macro-level is concerned with the structure of society as the primary object of study (Estes *et al.* 1995, Marshall 1995). Differences in the level of analysis have important consequences for the extent and scope of societal and individual responsibility for the prevention and consequences of frailty among older adults (Estes *et al.* 1995).

A common feature of conceptual models of frailty is their stress on individual–environment interactions. This focus on the individual as the primary unit of analysis reflects a micro-level of analysis (Buchner & Wagner 1992, Bortz 1993, Fried 1994, Campbell & Buchner 1997, Walston & Fried 1999). That is, frailty originates from, or exists within, an individual. In these models, environment is defined as the physical or biological environment of the individual. Rockwood *et al.* (1994) extended the notion of environment to include the impact of the immediate proximal

environment, such as attitudes of caregivers and availability of finances, on the development of frailty. However, in general, the environmental factors specified in these models are primarily assessed for their impact on individual (physical) functioning (Raphael *et al.* 1995).

Acceptance of an individualist or micro-level approach implies that, by altering the characteristics of an individual, health can be improved. Thus, the problem of frailty is viewed as a medical problem that falls to the medical community to identify and treat (Raphael *et al.* 1995). Kaufman (1994, p. 46) refers to this as the medicalization paradigm, in which 'personal and social problems and behaviors come to be viewed as diseases or medical problems that the medical and allied health professionals have a mandate to treat'. By framing the problems of frailty and, therefore, the solutions as biomedical, this view ignores the role of the broader environment and such non-medical issues as poverty and isolation (Raphael *et al.* 1995). Estes *et al.* (1995, p. 351) state that, from the perspective of society, 'theories that reduce problems of aging to the individual level shift any onus of responsibility from the state to the individual. As a result, any notion of problems stemming from the structural level, i.e. inequities in resource distribution and access, can be ignored'. Thus, this individualist viewpoint effectively depoliticizes the problems of frailty (Raphael *et al.* 1995).

Raphael *et al.* (1995) and Kaufman (1994) broadened the definition and role of the environment to include both immediate proximal and distal factors, reflecting a macro-level of analysis (Raphael *et al.* 1995). The presence of frailty may result from the presence or absence of numerous intersecting factors, many of which are external to the individual, and are conditions occurring within the environment: 'In this definition, ability is not seen as an asset residing within an individual, but rather a situation that exists for each individual' (Raphael *et al.* 1995, p. 225). That is, all levels are viewed in terms of mutual dependency that result in a condition of lived experience (Raphael *et al.* 1995). This view suggests that frailty can be addressed by altering the characteristics of the external environment rather than focusing entirely on the individual (Estes *et al.* 1995).

Kaufman (1994) proposes that frailty is a label that is primarily applied by the health care system. However, focusing on a person's medical needs ignores the broader influence of the environment on health (Aday 1993). In summary, the disparity in perspective between micro- and macro-levels of analysis in conceptual models of frailty may reflect not only the intellectual but also the political tension in the literature regarding who is responsible for the problems of frailty.

Assumptions about the ageing process

Conceptual models for understanding frailty both implicitly and explicitly suggest that it is a state of reduced physiological reserves associated with ageing that affects an individual's capacity for functional independence (Buchner & Wagner 1992, Bortz 1993, Fried 1994, Rockwood *et al.* 1994, Campbell & Buchner 1997). Fried (1994) refers to frailty as a wasting syndrome of advanced old age, while Rockwood *et al.* (1994) base their model of frailty on a model of breakdown among older people (Brocklehurst 1985). Rockwood *et al.* differentiate between the chronologically old vs. the biologically old (often called frail). Other models indicate that frailty results from age-related physiological losses in combination with disease, disuse and illness (Campbell & Buchner 1997) that 'historically has been difficult to separate' (Buchner & Wagner 1992, p. 4). Walston and Fried (1999), in a review of the medical literature, identified frailty as a syndrome that is age-related and common. Raphael *et al.* (1995, p. 225) incorporate the concept of reserve capacity into their model because 'the concept of reserve capacity is an integral part of most discussions of aging and its effects'.

'Frailty has age-specific connotations that reflect how aged persons are viewed in American society' (Becker 1994, p. 71). The association between frailty, ageing, physiological losses and dependence on others reinforces the assumption that ageing is synonymous with disease, disability and decline. The potential negative implications of this association are threefold. First, the notion of frailty has the potential to stereotype elders, with negative effects on well-being (Minkler 1990). The literature has associated frailty with a lack of hope, absence of positive outlook (Brown *et al.* 1995), and loss or declining abilities (Kaufman 1994). Secondly, when frail elders are classified as a homogeneous group, the assumption is that there is no individuality and that the experience of ageing is uniform (Becker 1994). Thirdly, current models reflect the view of ageing as a battle between independence and dependence on others, rather than looking at the capacity for autonomy and independence and maximizing a person's strengths (Kaufman 1994).

Assumptions about the stability of frailty

The various types of process involved in the conceptual models suggest that frailty is *not an all or nothing phenomena*. There are different degrees of frailty that have been described in relative terms, such as: (1) a series of episodic, progressive and irreversible losses (Campbell & Buchner 1997), (2) a continuum where frailty is defined as opposite to

vitality (Bortz 1993) and hardiness (Brown *et al.* 1995, Raphael *et al.* 1995), (3) a cycle – a process of declining energetics, including muscle mass loss, falling metabolic rate, and declining strength, energy expenditure and mobility (Fried 1994, Walston & Fried 1999), (4) a process of adaptation (Schulz & Williamson 1993), (5) a dynamic process with interacting factors characterized by different levels of dependence on others (Raphael *et al.* 1995), and (6) a quality and a dynamic adaptation process on the part of older people, families, and health care personnel (Kaufman 1994). These examples suggest that frailty is a relative state that changes over time.

The types of processes specified in a model have important implications for practice. First, the notion that frailty is a relative term suggests not thinking of people as either frail or not frail, but rather placing them on a continuum. The notion of different degrees of frailty suggests a vulnerable state in which an individual is at risk of becoming more or less frail over time. The implication of this is that frequent clinical assessments and movement in and out of periods of service may need to occur (Hallfors *et al.* 1994). The other implication is that the trajectory of frailty is unique for each individual. Secondly, the types of process specified in the model suggest that the process of frailty can be modified or reversed. Fried (1994) and Walston and Fried (1999), for example, describe the process of frailty as a cycle.

Summary

In summary, the review suggests that there are both intellectual and political tensions in conceptualizations of frailty in relation to older adults. These tensions are reflected in a number of ways, which limit the usefulness of the concept for informing clinical practice, policy and research.

First, the term 'frail' or 'frailty', in the general health and social science literature, is often used without definition or clear criteria in relation to older adults. Secondly, the literature suggests that a number of factors may contribute to frailty; however; these factors have not been related to a common meaning for frailty. A third problem is support for the view that frailty is uni-dimensional, predominantly biomedical in nature, and characterized solely on the basis of functional losses that influence a person's capacity for independence in activities in daily living. Fourthly, the components of frailty have been predominantly defined in an 'objective' way that is inadequate to represent its complex, holistic, and unique meaning for individuals. Fifthly, there is a disparity in perspectives among models in their level of analysis, which has important implications for level of intervention and responsibility for the problems of frailty in our society. A final problem is that the term reflects a negative and stereotypical view of ageing that is characterized by dependency, physical losses and the absence of positive outlook, rather than a focus on capacity for autonomy and maximizing a person's strength.

Implications for policy, practice and further research

In many countries, responsibility for delivering services to frail elders currently lies with numerous agencies, jurisdictions and professionals. As each of these have distinct funding mechanisms, criteria for identifying older people as frail, and responsibilities, important needs are often left unmet (MacKnight 1999). Differing assumptions about the level of intervention means that no single institution with both clinical and financial responsibility is ultimately responsible and accountable for the prevention and management of frailty.

Conceptualizations of frailty will not only influence access to services, but management strategies such as the nature, frequency and timing of client assessments and treatment. For example, if frailty is defined predominantly in terms of physical losses, assessment and management strategies will focus solely on this aspect. This may lead to fragmentation of care, with lack of attention to the whole person. Many long-term care programmes and services have protocols that assume stability of frailty among older adults. If the trajectory of frailty is unique and changeable in each individual, movement in and out of periods of service may need to occur (Brown *et al.* 1995).

The assumption that the process of frailty can be modified or reversed provides support for targeted health promotion interventions. However, the components of frailty have not been sufficiently defined to identify populations at risk or in need of proactive interventions. What is needed is an alternative theoretical approach that incorporates the following key concepts that are lacking in the current models and definitions: (a) the degree of frailty is context dependent and, therefore, greatly affected by the subjective perceptions of individuals, (b) frailty is multidimensional and results from a complex interplay of physical, psychological, social and environmental factors, (c) frailty is not age-related and, therefore, does not portray a negative and stereotypical view of ageing, and (d) frailty can originate from within an individual or from conditions in the environment. What is needed is a 'fit' between the needs and resources of the person and the demands and resources of the environment. Proactive, individualized, multi-disciplinary interventions, either targeted at the individual or the environment, can be developed

What is already known about this topic

- Despite increasing use of the term frailty over the past two decades, there is a lack of consensus in the literature regarding its meaning and use, and no clear conceptual guidelines for establishing criteria to describe older adults as frail.
- Differences in theoretical perspectives inevitably influence policy decisions regarding eligibility for, and allocation of, scarce healthcare resources among older adults.

What this paper adds

- It identifies four main categories of assumptions in conceptual models of frailty in the literature: namely, the nature of scientific knowledge, the level of analysis, the aging process, and the stability of frailty.
- It identifies the strengths and limitations of existing definitions and conceptual models of frailty on the basis of these underlying assumptions.
- It recommends a new and uniform theoretical approach to the concept of frailty, relevant to older adults, which is multidimensional, not age-related; subjectively defined; and includes both individual and environmental factors.

to identify and strengthen available resources, thereby reducing frailty and use of costly health care resources.

In summary, a common theoretical approach to the concept of frailty can inform policy and practice in the allocation of, and eligibility for, health care resources to prevent or delay frailty and the use of costly services. It can also serve as a conceptual guide for future research by defining study populations and developing assessment instruments. A common definition of frailty would enhance the comparability and generalizability of research involving older adults.

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