

Feature Articles

Knowledge and perceptions about aging and frailty: An integrative review of the literature

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ABSTRACT

A growing body of evidence indicates that biological aging or frailty is a determinant of health-related outcomes, however, frailty is likely poorly understood and under-recognized by the public-at-large. Using Whittemore and Knafl's methodology, we aimed to conduct an integrative review of research on public knowledge and perceptions of aging and frailty, and to create a conceptual model of our findings. Twenty-three studies are presented. The conceptual model suggests that culture, knowledge of aging, and stereotypes influence adults' beliefs and perceptions. Adults determine priorities about aging, and then subconsciously or consciously determine which parts are controllable. If deemed controllable and important, they may participate in health behaviors to mediate aging. If deemed uncontrollable or less important, adults may aim to control their own peace of mind through acceptance. Scant findings suggest that frailty is a more subjective term in which participants often optimistically do not identify themselves as frail.

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Introduction

From 2015 to 2030, the number of people over the age of 60 will grow from 901 million to 1.4 billion (globally), and the oldest old (\geq age 85) will increase from 125 million to 434 million.¹ In the United States (U.S.), from 2012 to 2050, the number of people age 65 and older will increase from 43.1 million to 83.7 million.² These demographic shifts increasingly highlight the burden and challenges of aging, and more specifically, frailty, a state of vulnerability to endogenous and exogenous stressors that increase the risk for negative health outcomes.³

A growing body of evidence indicates that biological aging (vs. chronological aging) at cellular and molecular levels contributes to the development of chronic disease and physical frailty that lead to decline and death.⁴ Frailty may be a more accurate determinant of health-related outcomes than age, and it may be prevented or mitigated through the use of targeted interventions.^{5–7} Globally, frailty is strongly associated with increased health care expenditures and gross domestic product; policy initiatives focused on frailty hold potential for dramatic cost reductions.^{8,9}

In light of these trends, we wished to examine the extent to which the public, across different countries, understands the concepts of aging

and frailty. We sought to understand public knowledge and perceptions about aging and frailty as a baseline for studying the effects of public health initiatives aimed at increasing awareness about the aging process and improving quality of life. We hypothesized that community-dwelling adults' knowledge of the concept of frailty is poor and that few (if any) reports exist summarizing a lack of knowledge. The aim of this integrative review is to present the literature that describes public knowledge and perceptions of aging and frailty, and to create a conceptual model that characterizes our findings.

Material and methods

The integrative review methodology was introduced by Whittemore and Knafl.¹⁰ Integrative reviews provide a rigorous framework for reviewing and synthesizing reports that utilize diverse methodologies, including both quantitative and qualitative designs.¹⁰ An integrative approach was selected for this review because of the prevalence of quantitative, qualitative and mixed designs that have been used to research knowledge and perceptions of aging.

Problem identification

Emerging data about the prognostic value of frailty and health behaviors that may prevent or mitigate frailty provide an incentive to

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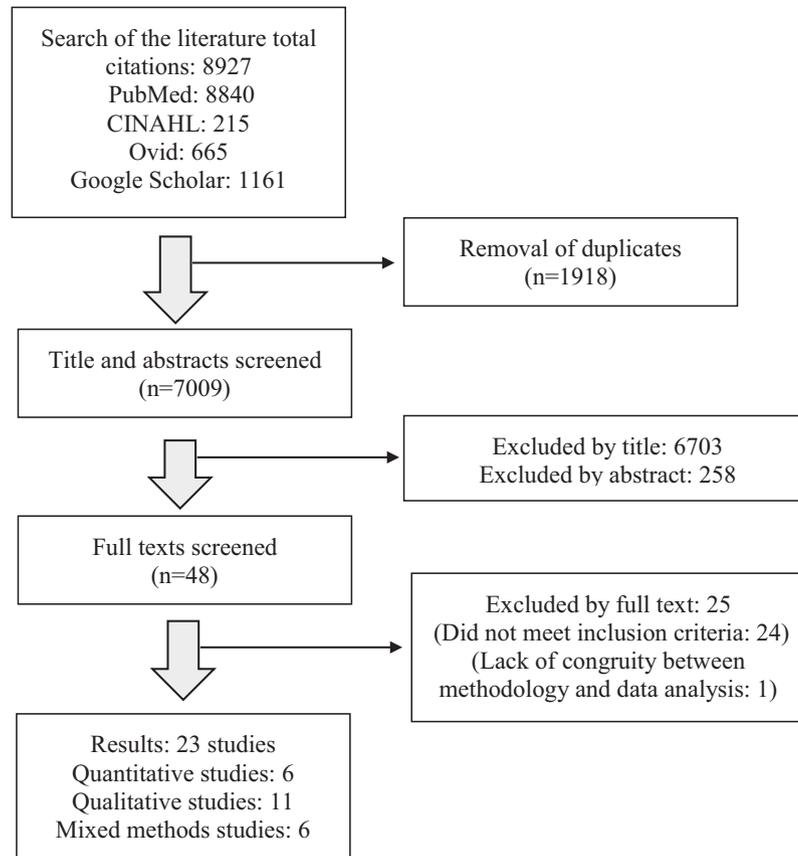


Fig. 1. Flow diagram of literature search and selection process.

invest in public education regarding frailty and healthy aging.¹ An awareness of the current state of public knowledge and perceptions about aging and frailty will establish a foundation for future comparison and could inform the design of effective education and self-management support (i.e., health coaching) interventions. However, literature reviews and information about public knowledge and perceptions of aging or frailty is lacking. Empirical and theoretical methodologic approaches have explored this subject, thus, a review methodology that incorporates diverse research designs is necessary. Given the paucity of studies available on our topic and the relative stability of the concept of aging over time, no time limitations were placed on this review.

Literature search

A search strategy was developed by a team of nurse investigators in our institution. Search terms included “aging,” “successful aging,” “social aging,” “frailty,” “older adults,” and “normative beliefs.” All terms were searched in combination with the keywords “knowledge” and/or “perception.” A comprehensive search of databases, PubMed, CINAHL, Ovid, and Google Scholar, was conducted for years 1990 to 2017.

Articles were included if they met the following criteria: 1) focused on layperson understanding of aging and/or frailty, 2) were peer-reviewed, 3) were published in English, 4) featured quantitative, qualitative, or mixed methods research, and 5) specifically addressed knowledge or perceptions. Articles were excluded if they were: 1) published in non-English, 2) addressed knowledge and perceptions of healthcare providers, 3) opinion articles, study protocols, and conference abstracts, 4) measurement tool development studies, 5) systematic reviews, or 6)

addressed knowledge and perceptions of aging/frailty as secondary or tertiary aims. Fig. 1 provides a flowchart of the literature search. A hand search of references of retrieved studies and purposive sampling were used to augment the search. Twenty-four articles were preliminarily included in the review.

Data evaluation

Quality appraisal of the studies in this review was conducted with the Joanna Briggs Institute (JBI) Critical Appraisal Tools for cross-sectional and qualitative studies,¹¹ JBI methods include comprehensive tools for diverse study designs. To assess the quality of each study in this review, each article was reviewed by at least two authors who independently checked the extent to which each met JBI appraisal criteria, noting limitations that might influence accuracy of study findings. Tables 1 & 2 summarize our quality appraisal. One study was excluded because of lack of congruity between research methodology and the representation and analysis of data.¹² The final sample included 23 studies.

Data analysis

Data reduction

Studies were initially divided into qualitative, quantitative, and mixed method groupings, and each group was displayed on a table that included reference and major findings/themes. Full text of all studies were reviewed, and data were organized according to themes and relationships using constant comparison. Open coding was completed by extracting recurrent concepts to a separate table. A second full text review of all articles was completed to assess for relationships between concepts, and axial coding was completed by

Table 1
Quality appraisal of qualitative and mixed methods studies.

JBI Critical Appraisal Checklist for Qualitative Research										
Author (Year)	Congruity between the stated philosophical perspective and the research methodology?	Congruity between the research methodology and the research question or objective?	Congruity between the research methodology and the methods used to collect data?	Congruity between the research methodology and the representation and analysis of data?	Congruity between the research methodology and interpretation of results?	Statement locating the researcher culturally or theoretically?	Is influence of researcher on the research, and vice-versa, addressed?	Are participants and their voices, adequately represented?	Is the research ethical according to current criteria, and is there evidence of ethical approval?	Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?
Knight 2003	Y	Y	Y	Y	Y	Y	N	Y	Y, N	Y
Duay 2006	Y	Y	Y	Y	Y	U	N	Y	Y, Y	Y
Reichstadt 2007	Y	Y	Y	Y	Y	U	U	Y	Y, Y	Y
Horton 2008	Y	Y	Y	Y	Y	N	U	Y	Y, N	Y
Puts 2009	Y	Y	Y	Y	Y	Y	U	Y	Y, N	Y
Laditka 2009	Y	Y	Y	Y	Y	Y	N	Y	Y, Y	Y
Iwamasa 2011	Y	Y	Y	Y	Y	Y	Y	Y	Y, N	Y
Hilton 2012	Y	Y	Y	Y	Y	Y	Y	Y	Y, N	Y
Cherry 2013	Y	Y	Y	Y	Y	U	Y	Y	Y, N	Y
Swift 2013	Y	Y	Y	Y	Y	Y	N	Y	Y, N	Y
Tate 2013	Y	Y	Y	Y	Y	N	Y	Y	Y, N	Y
Troutman 2013	Y	Y	Y	Y	Y	Y	Y	Y	Y, N	Y
Calasanti 2015	Y	Y	Y	Y	Y	U	U	Y	U, Y	Y
Nosraty 2015	Y	Y	Y	Y	Y	Y	Y	Y	U, Y	Y
Warmoth 2016	Y	Y	Y	Y	Y	Y	Y	Y	Y, Y	Y
Amin 2017	Y	Y	Y	Y	Y	Y	N	Y	Y, Y	Y
Feng 2017	Y	Y	Y	Y	Y	Y	U	Y	Y, N	Y

Table 2
Quality appraisal of quantitative studies for cross-sectional research.

JBI Critical Appraisal Checklist for Qualitative Research							
	Were the criteria for inclusion in the sample clearly defined?	Were the study subjects and the setting described in detail?	Was the exposure measured in a valid and reliable way? Were objective, standard criteria used for measurement of the condition?	Were confounding factors identified?	Were strategies to deal with confounding factors stated?	Were the outcomes measured in a valid and reliable way?	Was appropriate statistical analysis used?
Seccombe 1991	U	Y	Y	NA	NA	Y	Y
Neikrug 1998	Y	Y	Y	N	N	Y	Y
Knight 2003	U	Y	Y	Y	Y	Y	Y
Davis 2004	Y	Y	Y	Y	Y	Y	Y
Phelan 2004	Y	Y	Y	Y	Y	Y	Y
Yun 2006	U	Y	Y	U	Y	Y	Y
Laditka 2009	N	Y	Y	Y	Y	Y	Y
Hilton 2012	Y	Y	Y	Y	Y	Y	Y
Swift 2013	Y	Y	Y	Y	Y	Y	Y
Tate 2013	Y	Y	Y	Y	Y	Y	Y
Feng 2017	Y	Y	NA	Y	Y	Y	Y
Lee 2017	Y	Y	Y	Y	Y	Y	Y

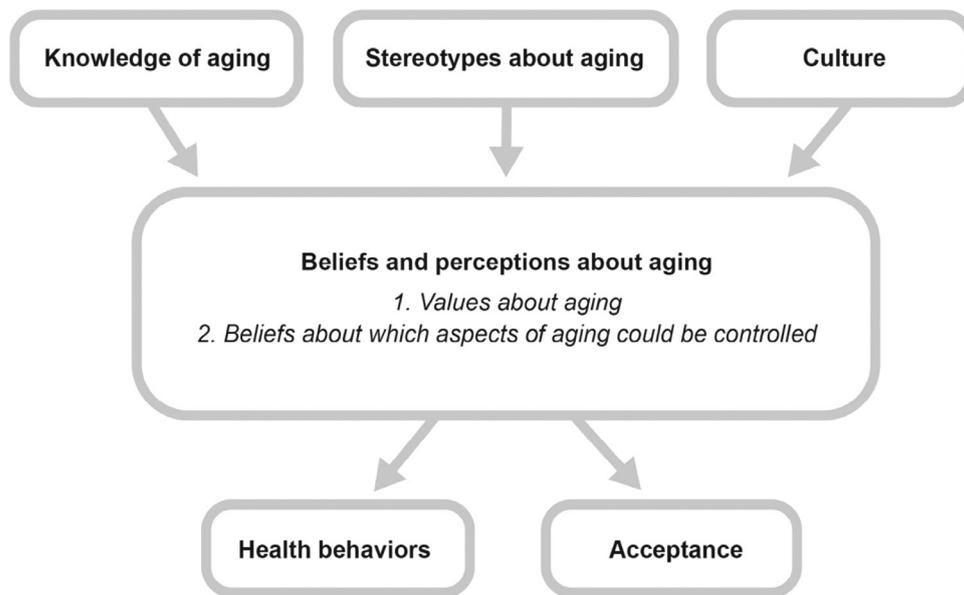


Fig. 2. Conceptual Model of Knowledge and Perceptions on Aging.

describing relationships between concepts selected during open coding.

Data display

Final concepts and relationships were compiled into a visual display as recommended by Whittemore and Knafel. The resulting conceptual model (Fig. 2) was proposed by the first author and corroborated by the full authorship roundtable. Evidence tables capturing the reports' designs, aims, study populations/sites, and major findings were compiled as a means of collating the original source material (Table 3).

Data comparison

The first author led open and axial coding and brought the developing model to round table sessions with all authors for data comparison and adjustment. A consensus process with all authors present was used to develop and formulate the final conclusions and model.

Conclusion drawing and verification

Several authors noted the evolution of the term "successful aging" over time within published literature, therefore a final full text review of articles in chronological order concluded the review. During the final review, the conceptual model and conclusions were verified with primary data sources, and additional notes were added regarding the longitudinal progression of concepts, including successful aging.

Results

Description of evidence

Twenty-three studies (1991 to 2017) met inclusion criteria for this integrative review. Studies are summarized according to design, setting, sample, and major findings (Tables 3–5).

Types of studies

This review included six quantitative studies,^{13–18} eleven qualitative studies,^{19–29} and six mixed-methods studies.^{30–35} Designs utilized in the studies included cross-sectional surveys

($n = 7$),^{13–16,18,30,31} longitudinal surveys ($n = 2$),^{34,35} in-depth interviews ($n = 11$),^{17,19–23,25,26,29,30,32} and focus groups ($n = 4$).^{24,27,28,33}

Setting

Studies were conducted in 10 countries: United States,^{13,16–18,20–22,24,27,28,31,33} Canada,^{23,34,35} United Kingdom,²⁹ Australia,³² Bangladesh,¹⁹ Finland,²⁵ Israel,¹⁵ Netherlands,²⁶ Singapore,³⁰ and South Korea.¹⁸

Sample

Sample sizes for the six quantitative studies ranged from 320¹⁸ to 2,329¹⁷ with male and female participants in all studies. Four quantitative studies included older participants (\geq age 50), while two included younger (age 19+) and older adults. Qualitative study sample sizes ranged from 12¹⁹ to 77²⁴ with male and female participants, and ages ranging from 42 to 99. Four studies^{24,27,28,33} conducted focus groups ranging from three²⁸ to 42³³ groups. Sample sizes for the mixed-method studies ranged from 60^{31,32} to 2,043³⁵ with two studies^{34,35} including only male participants. Age of participants in mixed method studies ranged from 50 to 88. Overall, the 23 studies represented 12,202 adult participants. Although not all studies reported gender or race/ethnicity of participants, among the reporting studies, at least 4,952 (40.6%) participants were female. At least 460 (3.8%) were African American (AA), and 2,730 (22.4%) were other (Japanese American, Bengali, Israeli, Latino, Chinese, Korean, Singaporean and Vietnamese).

Knowledge and perceptions of aging and frailty

Aging

Twenty-one studies addressed knowledge or perceptions of aging among participants. The relationship between knowledge of aging and perceptions of aging was addressed indirectly in one study,¹⁵ but we found no studies that explicitly characterized the relationship between knowledge and perceptions of aging. Further, we found no studies describing a relationship between knowledge of aging and health behaviors, health status, or frailty.

Concepts and themes recurred throughout studies related to aging, including: knowledge of aging; aging stereotypes; culture; beliefs and perceptions about aging; health behaviors; and

Table 3
Quantitative Articles.

APA reference	Design	Setting	Sample	Results
Davis, N.C., & Friedrich, D. (2004). Knowledge of aging and life satisfaction among older adults. <i>International Journal of Aging and Human Development</i> , 59(1), 43–61.	Prospective cross sectional Facts on Aging Quiz ⁴³ and life satisfaction survey	United States (U.S.), (Florida, n = 295; central Michigan, n = 40; traveling to northwest Florida, n = 65)	N = 400 (n = 257, 64% female) Age 60–95, stratified into 3 groups by age 83% white 13% African-American 4% other	Knowledge of aging scores varied by age and gender, with older groups successively knowing less than younger, and women knowing less than men. Knowledge of aging was associated with education, financial status, health, living arrangement, and volunteerism. Greater knowledge of aging was associated with higher life satisfaction.
Lee, J.E., Kahana, B., & Kahana, E. (2017). Successful aging from the viewpoint of older adults: Development of a brief successful aging inventory (SAI). <i>Gerontology</i> , 63, 359–371.	Cross sectional survey (with validation)	United States (U.S.), (Florida, n = 293; Cleveland, Ohio, n = 257)	N = 550 (n = 390, 70.9% female) Age 66–105, M = 81.76, stratified into 2 groups by age 72% white	Multigroup confirmatory factor analysis sorted 12 items for Successful Aging into a 4-factor model. The 4-factor model was a good fit for both age groups. The 4 factors are: 1. Proactive engagement 2. Wellness resources 3. Positive spirit 4. Valued relationships Older respondents considered "Positive spirit" to be more important than younger respondents.
Neikrug, S. M. (1998). The value of gerontological knowledge for elders: A study of the relationship between knowledge on aging and worry about the future. <i>Educational Gerontology: An International Quarterly</i> , 24(3), 287–296.	Cross sectional Facts on Aging Quiz ³⁵ and Worry Scale ⁴³	Israel	N = 361 (n = 251, 69.5% female) Age 26–89, mean 38 29% Israeli-born 71% born abroad	Higher scores on Facts on Aging Quiz are correlated with lower reported worry across all subgroup analyses. More years of education and higher socioeconomic status are correlated with both greater knowledge of aging and lower reported worry. When stratified by age, a trend was observed wherein worry scores increased with age through the group entering retirement (age 65–74) and then declined in the oldest group.
Phelan, E.A., Anderson, L.A., LaCroix, A.Z., & Larson, E.B. (2004). Older adults' views of "successful aging"—how do they compare with researchers' definitions?. <i>Journal of the American Geriatrics Society</i> , 52(2), 211–216.	Prospective cross sectional survey	U.S. (Seattle, WA)	N = 1890 (n = 1054, 55.8% female) Age range not reported; average age of Japanese-American participants 78.3; average age of white participants 79.7 37.9% Japanese-American 62.1% white	90% of the participants had thought about aging as well as aging successfully, and 60% reported that their thoughts about aging had changed over the past 20 years. When asked to rate whether 20 items were important to successful aging, 13 items were rated as important by 75% or more of participants in both the Japanese-American (J-A) and white (W) cohorts: 1. Remaining in good health until close to death (92.8% J-A; 94.9% W) 2. Feeling satisfied with my life the majority of the time (78.0% J-A; 84.2% W) 3. Having friends and family who are there for me (85.7% J-A; 90.2% W) 4. Staying involved with the world and people around me (76.0% J-A; 87.5% W) 5. Being able to make choices about things that affect how I age, like my diet, exercise and smoking (85.4% J-A; 91.5% W) 6. Being able to meet all of my needs and some of my wants (81.2% J-A; 91.6% W) 7. Not feeling lonely or isolated (75.1% J-A; 83.5%) 8. Adjusting to changes that are related to aging (76.3% J-A; 83.4% W) 9. Being able to take care of myself until close to the time of my death (92.9% J-A; 94.7% W) 10. Feeling good about myself (79.0% J-A; 85.1% W) 11. Being able to cope with the challenges of my later years (83.9% J-A; 92.8% W) 12. Remaining free of chronic disease (90.7% J-A; 90.1% W) 13. Being able to act according to my own inner standards and values (81.3% J-A; 91.6% W) An additional item was rated as important by at least 75% of white respondents- Continuing to learn new things (78.6% W).

(continued on next page)

Table 3 (Continued)

APA reference	Design	Setting	Sample	Results
Secombe, K., & Ishii-Kuntz, M. (1991). Perceptions of problems associated with aging: Comparisons among four older age cohorts. <i>The Gerontologist</i> , 31(4), 527–533.	Secondary data analysis of cross sectional survey	U.S.	N = 2,329 persons (n = 1298, 55.7% female) Age range not reported; n = 492 age 55–64; n = 1174 age 65–74; n = 556 age 75–84; n = 107 age 85+ 75.1% white 14.5% black 10.4% “other”	Report examined perceptions of aging among four distinct age cohorts: middle age (55–64); young old (65–74); old (75–84); and oldest old (85+). Middle-aged individuals (55–65) were more pessimistic and experienced more challenges in coping with aging compared to other cohorts. The oldest old (85+) were the most optimistic and had the most positive view regarding aging.
Yun, R. J., & Lachman, M. E. (2006). Perceptions of aging in two cultures: Korean and American views on old age. <i>Journal of cross-cultural gerontology</i> , 21(1–2), 55–70.	Prospective cross sectional survey	U.S. (Boston, MA) and South Korea (Seoul)	N = 320 (n = 110, 34.3% female) Age 19–91 stratified into 3 groups American group: 92% white 5% Black/African-American 1% Latino/Hispanic 1% Asian/Pacific Islander 1% Other South Korean group: 100% Asian/Pacific Islander	There were significant cultural differences in the total anxiety scale as well as three of the four subscales. When comparing Koreans to Americans, Koreans reported higher anxiety levels in relation to aging, a greater fear of old people, greater concerns about their psychological well-being, and greater concerns over physical appearance. Within the American sample, females reported more anxiety about aging and physical appearance than males. Older adults in both cultures reported greater psychological concerns and fear of loss than the younger groups.

acceptance. Beliefs and perceptions about aging were subdivided to include: values about aging, and beliefs about which aspects of aging could be controlled. Relationships between the major concepts were rarely tested, rather, they were implied or reported as themes in many of the studies. Our developed conceptual model identifies concepts and links between major themes identified in our review (Fig. 1). The following sections present our findings according to the model.

Knowledge about aging

Two studies^{13,15} characterized knowledge about aging through use of the *Palmore Facts on Aging* quiz³⁶ and reported an association between greater knowledge about aging and greater life satisfaction¹³ and less worry.¹⁵ In both studies, higher education and greater financial security were associated with greater knowledge of aging. The studies suggest that enhanced public education about aging has the potential to increase life satisfaction¹³ and reduce worry.¹⁶

Stereotypes about aging

Four studies explored adults' stereotypes about aging^{17,18,20,23} and, three of these included younger or middle-aged adults.^{17,18,20} Two studies reported an association between stereotypes about aging and aging-related anxiety.^{18,20} One study¹⁷ stratified adults by age and found older adults to have fewer negative perceptions of aging and more optimism than their younger counterparts. In all four studies, authors reported themes of *control* and *acceptance* related to aging. Calasanti et al.²⁰ discussed tension and anxiety in relationship to perceived ability to control the aging process. Secombe et al.¹⁷ concluded that older (versus younger) adults were more accepting of problems related to aging, suggesting that perceptions change over time as adults age.

Culture

Eight studies describe the influence of culture and cultural differences on perceptions of aging^{16,18,19,24,28,30,31,33} with the following cultures represented: Japanese-American,¹⁶ South Korean,¹⁸ Latino,³¹ Chinese,³³ Vietnamese,³³ Singaporean,³⁰ Bengali,¹⁹ and American Indian.³³ The studies describe how differences in cultural background affect participants' perceptions of aging. One study²⁸ compared and contrasted definitions of successful aging between black and white older adults living in the southern U.S.²⁵ Findings across studies affirmed that perceptions of aging are unique and

individualized to each person, and they suggested that when groups with similar backgrounds are compared to one another, population differences may be partially accounted for by culture/background. Other studies^{13,20–22,34} acknowledged that data derived from a geographically and/or culturally homogenous background may be impacted by that geography/background, however, the influence of culture was not specifically addressed.

Beliefs and perceptions of aging

Over time, research has shifted from a normative or prescriptive description of “good” aging to a broader description that acknowledges the variability of experiences and values of older adults.²⁵ The studies in our review support a perspective of aging that is holistic (not only physical), that may or may not prioritize longevity, and that may be highly variable between individuals. An analysis of the studies' major findings suggest two types of beliefs or perceptions about aging: 1) values about aging, and 2) opinions or beliefs about aspects of aging that can be controlled.

Values about aging

Fifteen studies described older adults' values or priorities about aging.^{14,16,19–22,24,25,27,28,30–33,35} The information was most commonly elicited by asking older adults how they defined the term “successful aging.” Other studies used prompts such as “Describe someone you think is aging well”³³ or “Define what you consider to be a good old age and how to achieve it”.²⁵ Individual responses were highly variable.

While many studies described older adults' values about aging, none sought to link these values directly to participants' knowledge of aging. As noted above, two studies linked values to culture.^{24,28} However, overall, the relationships between older adults' values and demographic characteristics, knowledge of aging, stereotypes of aging, and health behaviors are underexplored.

Opinions about which parts of aging can be controlled

A second component of beliefs about aging was participants' opinions about which parts of aging can be controlled. Two studies^{22,27} noted that participants actively or consciously attempted to determine which aspects of aging could be controlled, so that they could take active steps to address controllable aspects of aging while focusing on accepting or adjusting to less controllable

Table 4
Qualitative Articles.

APA reference	Study Design	Setting	Sample	Themes
Amin, I. (2017). Perceptions of successful aging among older adults in Bangladesh: An exploratory study. <i>Journal of cross-cultural gerontology</i> , 32, 191–207.	Semi-structured, in-depth interviews	Bangladesh	N = 12 (n = 5, 41.7% female) Age 60–90 100% Bengali	1. Adaptation to aging body 2. Financial security 3. Family and intergenerational care 4. Social participation
Calasanti, T. (2015). Combating ageism: How successful is successful aging? <i>The Gerontologist</i> , 00(00), 1–9.	Semi-structured, in-depth interviews	U.S.	N = 19 (n = 10, 52.6% female) Age 42–61, mean 53 100% white 15.8% nonheterosexual	<u>Successful Aging</u> - Respondents think that they can & should achieve successful aging. <u>Individual responsibility for successful aging</u> - Respondents may blame themselves or others who do not age successfully. <u>Tensions in the Discourse</u> - Respondents report simultaneous acceptance & resistance to aging process. <u>Feelings about Aging and Ageism</u> - Respondents experience continued fears of aging and are highly concerned with ability to control the aging process.
Cherry, K.E., Marks, L.D., Benedetto, T., Sullivan, M.C., & Barker, A. (2013). Perceptions of longevity and successful aging in very old adults. <i>Journal of Religion, Spirituality & Aging</i> 25(4), 288–310.	Descriptive exploratory, in-depth, semi-structured interviews	U.S. (Louisiana)	N = 90 (gender distribution not reported) Age 60–94 stratified into 3 age groups: young old, age 60–74, n = 19; old-old, age 76–89, n = 26; oldest old, age 90–94, n = 45 92.2% Caucasian 3.3% African American 1.1% American Indian 3.3% Other	1) Maintaining physical, mental, and relational well-being 2) Living a healthy life 3) Living a faithful life Notes about age stratified results: - Older participants focused more on introspective issues vs. social networks and future opportunities. - Diet and exercise were mentioned less in the older cohorts. - Younger cohorts emphasized involvement in faith communities; older cohort referenced faith in God.
Duay, D.L., & Bryan, V.C. (2006). Senior adults' perceptions of successful aging. <i>Educational Gerontology</i> , 32(6), 423–445.	Structured interview, open-ended questions	U.S. (Southeast)	N = 18 (n = 11, 61.1% female) Age 60–86 (M = 72.6) 94.4% Caucasian 5.6% Latino	1. Engaging with others a. Staying connected with family b. Maintaining social relationships c. Volunteering and participating in community activities 2. Coping with changes a. Facing and dealing with problems b. Being open and accepting of changes c. Depending on spiritual faith d. Keeping a positive attitude e. Using learning as a coping strategy 3. Maintaining physical, mental and financial health a. Taking care of self while young b. Learning, engaging in intellectual stimulation c. Preparing for future financially
Horton, S., Baker, J., Cote, J., & Deakin, J.M. (2008). Understanding seniors' perceptions and stereotypes of aging. <i>Educational Gerontology</i> , 34(11), 997–1017.	Semi-structured interviews	Canada	N = 20 (n = 9, 45% female) Age 62–74 (M = 67.5) 100% Caucasian	<u>Major themes</u> : 1. Stereotypes & beliefs 2. Attitudes towards physical activity <u>Seven categories within these 2 main themes</u> : 1. Ageism in society 2. Seniors' self-stereotypes (comparison to other seniors the senior knows) 3. Role models from their own life 4. Opinions of an exemplar role model 5. Importance of physical activity 6. Barriers to exercise primarily psychological 7. Inspiration to exercise
Iwamasa, G. Y., & Iwasaki, M. (2011). A new multidimensional model of successful aging: Perceptions of Japanese American older adults. <i>Journal of Cross-Cultural Gerontology</i> , 26(3), 261–278.	Focus groups using ethnographic, grounded theory approach	U.S. (Los Angeles, CA)	N = 77 (n = 53, 68.8% female) Age 55–96 (M = 78.3) 100% Japanese American: Issei (1 st generation), n = 19 Nisei (2 nd generation), n = 53 Sansei (3 rd generation), n = 4	Successful aging was perceived by the participants as interrelated optimal function with regard to: • physical health • psychological health • cognitive functioning • socialization • spirituality • financial security Notes: Spirituality and financial security may be unique to Japanese-American culture. Existing models of successful aging may be individualistic rather than collectivist, which may limit their applicability to collectivist cultures such as Japanese-American culture.

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Table 4 (Continued)

APA reference	Study Design	Setting	Sample	Themes
Nosraty, L., Jylha, M., Raittila, T., & Lumme-Sandt, K. (2015). Perceptions by the oldest old of successful aging, Vitality 90 + Study. <i>Journal of Aging Studies</i> , 32, 50–58.	Life-story interviews	Finland	N = 45 (n = 25, 55.6% female) Age 90–91 Race/cultural distribution not reported	Viewpoints about aging were diverse and complex, so authors chose a large number of themes and sub-themes and noted that the findings did not translate well into a single theory or model of aging. Authors note that the content they found in the themes of physical aging, cognitive and psychological aging, and social aging were similar to the larger body of evidence on successful aging. However, themes of death, a balanced and harmonious life, independence, and life circumstances emerged as very important to their participants but generally underrepresented in the successful aging literature.
Puts, M.T.E., Shekary, N., Widdershoven, G., Heldens, J., & Deeg, D.J.H. (2009). The meaning of frailty according to Dutch older frail and non-frail persons. <i>Journal of Aging Studies</i> , 23(4), 258–266.	Semi-structured interviews	Netherlands (Amsterdam and vicinity)	N = 25 (n = 11, 44% female) Age 67–90, M = 78.7 Mix of frail (n = 11) and non-frail (n = 14) (frailty defined as at least 3/8 markers: low body mass index, low peak expiratory flow, poor vision and hearing ability, incontinence, low sense of mastery, depressive symptoms, and physical inactivity)	Dimensions of Frailty: 1. Physical functioning (described more often by men) 2. Psychological/cognitive functioning 3. Social functioning (described more often by women) More than half (n = 6) of the frail participants did not consider themselves to be frail. Non-frail participants more likely to discuss frailty prevention via physical activity; frail persons more likely to describe frailty as inevitable.
Reichstadt, J., Depp, C.A., Palinkas, L.A., Folsom, D.P., & Jeste, D.V. (2007). Building blocks of successful aging: A focus group study of older adults' perceived contributors to successful aging. <i>The American Journal of Geriatric Psychiatry</i> , 15(3), 194–201.	Focus groups (12) using grounded theory	U.S. (San Diego, CA)	N = 72 (n = 38, 53% female) Age 60–99 Race/cultural distribution not reported	33 factors identified with 4 major themes (all of which were interrelated and built upon each other): • attitude/adaptation • security/stability • health/wellness • engagement/stimulation Each focus group emphasized the need for: • positive attitude • realistic perspective • ability to adapt to change
Troutman-Jordan, M., Nies, M.A., & Davis, B. 2013. An examination of successful aging among Southern Black and White older adults. <i>Journal of Gerontological Nursing</i> , 39(3), 42–52.	Focus groups (3)	U.S. (North Carolina)	N = 52 (n = 43, 82.7% female) Age 60–89 (M = 77.1) 44.2% White 55.8% Black	Four central themes: 1) Connecting & relating : Importance of spirituality, friends & social life, and spouse 2) Temporality : Focus on experiences and history as well as concerns for the future 3) Perception & interpretation : Mental perceptions and cognitive and behavioral adjustments 4) Activity : Mobility, independence, exercise, and nutrition Major themes were consistent between participants of both races, with some subtle differences noted by authors throughout.
Warmoth, K., Lang, I.A., Phoenix, C., Abraham, C., Andrew, M., Hubbard, R.E., & Tarrant, M. (2016). 'Thinking you're old and frail': A qualitative study of frailty in older adults. <i>Ageing and Society</i> , 36, 1483–1500.	Semi-structured interviews plus frailty index	United Kingdom (South West of England)	N = 29 (n = 17, 58.6% female) Age 66–98 Frailty status varied from 'very fit' to 'moderately frail'	1. Views on physical and psychological frailty 2. The process of self-identification as frail 3. Strategies used to resist identification

aspects. Another study³⁴ used participants' definitions of successful aging to identify the prevalence and trends of perceptions that aging was either mostly under the person's active control (primary control) or was uncontrollable and should be accepted (secondary control). Participants used a mix of both control mechanisms, with many participants shifting towards more secondary control as they aged.³⁴

Health behaviors

A common theme was that participants viewed aging and health behaviors as inextricably linked. Studies exploring good or successful aging commonly found participants referencing the importance of health behaviors to achieve the quality of aging they desired.^{19–25,27,28,32–35} Older adults in these studies discussed health behaviors with enough frequency to comprise one or more major themes in each of the cited studies. Findings suggested that when an

individual perceives an aspect of aging to be both controllable and supportive of their unique values, they might participate in health behaviors such as diet or exercise to address that aspect of aging. Notably, the studies relied on participants' subjective report of health behaviors. We found no studies linking perceptions of aging with measured health behaviors.

Acceptance

Many studies noted that older adults discussed the idea of shifting locus of control from health-promoting activities to controlling their peace of mind by accepting age-related changes.^{21,22,24,25,28,31–35} Most elicited information from participants about successful aging and reported a major theme that captured the notion of accepting or adjusting to aspects of aging.^{21,22,24,25,28,32,33,35} Certain studies grouped this theme with psychological well-being, implying that participants' ability to accept changes of aging could be linked to

Table 5
Mixed methods.

APA reference	Design	Setting	Sample	Results
Feng, Q., & Staughan, P.T. (2017) What does successful aging mean? Lay perception of successful aging among elderly Singaporeans <i>The journals of gerontology. Series B, Psychological sciences and social sciences</i> , 72(2), 204–213.	Qualitative interviews and national survey	Singapore	Interviews: N = 49 (n = 27, 55.1% female) Age M = 69.8 Survey: N = 1,540 (n = 949, 61.6% female) Age M = 58.9	Major domains (% respondents who considered component important) To be happy (99.1) To be physically mobile (99.0) To be free of diseases (98.3) To be financially secure (97.9) To be independent in life (95.4) To be able to take care of other family members (91.8) To have friends (91.7) To be able to continue working (83.1) To engage in social activity (76.3) To have my spouse with me (81.7) To have children living together with me (74.5) To have children taking care of me (62.3)
Hilton, J.M., Gonzalez, C.A., Saleh, M., Maitoza, R., & Anngela-Cole, L. (2012). Perceptions of successful aging among older Latinos, in cross-cultural context. <i>Journal of Cross-Cultural Gerontology</i> , 27(3), 183–199.	Open-ended interview and interviewer-guided written questionnaire	U.S. (Western states)	N = 60 (n = 38, 63.3% female) Age 50–84 (M = 61) 100% Latino	Latinos responded somewhat differently than other cultural groups to the Phelan successful aging questionnaire, ranking all but one of twenty categories (Longevity) as important, with “Act on inner standards” and “Feel good about self” being the two highest ranked dimensions. In comparison to Japanese-Americans, Latino-Americans had less in common with Anglos, suggesting that Latino-Americans have maintained their cultural groups to a greater extent. Ten themes were identified from open-ended interviews, six of which are not captured by Phelan’s successful aging questionnaire: self-care, acceptance, positive attitude, cognitive functioning, financial well-being, and spirituality.
Knight, T., & Ricciardelli, L.A. (2003). Successful aging: Perceptions of adults aged between 70 and 101 years. <i>The International Journal of Aging and Human Development</i> , 56(3), 223–245.	Semi-structured interviews	Australia (Melbourne)	N = 60 (n = 42, 70% female) Age 70–101 Race/cultural distribution not addressed	Major themes (% of respondents who mentioned the theme): Health (53.3%) Activity (50%) Personal growth (36.7%) Happiness/Contentment (31.7%) Relationships (25%) Independence (20%) Appreciation/Value of life (18.3%) Longevity (3.3%) Authors note these findings are similar to/in accordance with other studies’.
Laditka, S.B., Corwin, S.J., Laditka, J.N., Liu, R., Tseng, W. Wu, B., Beard, R.L, Sharkey, J.R., & Ivey, S. L. (2009). Attitudes about aging well among a diverse group of older Americans: Implications for promoting cognitive health. <i>The Gerontologist</i> , 49(S1), S30–S39.	Focus groups (42)	U.S.	N = 396 (n = 314, 79.4% female) Age range not reported, M = 71.0 49.2% non-Hispanic White (19 focus groups) 24% African American (10 focus groups) 8.6% American Indian (4 focus groups) 9.1% Chinese (4 focus groups) 6.6% Vietnamese (3 focus groups) 2.5% Hispanic (2 focus groups)	Authors noted 6 major themes across cultural groups, with some subtle differences between cultural groups identified throughout: 1. Living to advanced age 2. Social involvement/Interaction themes: staying socially active; having leisure activities; volunteering for civic and community service; being involved in church and community 3. Mental attitude themes: having a positive attitude/not worrying; connecting mind and body; managing stress/coping; accepting aging and health limitations 4. Cognition themes: cognitively alert/not impaired; having a good memory; engaging in cognitive activities 5. Physical health themes: staying “active” or “busy”; being mobile; continuing to work; living independently and driving; having few or no medical or health problems; having health promoting behaviors; having a good physical appearance; inheriting “good genes” a. Spirituality themes: receiving support/blessings from God; being active in a faith community
Swift, A.U., & Tate, R.B. (2013). Themes from older men’s lay definitions of successful aging as indicators of primary and secondary control beliefs over time: The Manitoba Follow-up Study. <i>Journal of Aging Studies</i> , 27(4), 410–418.	Longitudinal, open-ended survey	Canada (Manitoba)	N = 1745 (n = 0 female) Data collected every two years from when men were age 74–88 Race/cultural distribution not reported	Among men who reported themes of secondary control at baseline, prevalence of secondary control themes increased over time, and those with a mix of themes at baseline reported increase in secondary control themes over time. However, overall, the shift in prevalence from primary to secondary control was not as large as the authors expected, with each year of aging conferring only a 3% greater odd of reporting a theme of secondary control.

(continued on next page)

Table 5 (Continued)

APA reference	Design	Setting	Sample	Results
Tate, R.B., Swift, A.U., & Bayomi, D.J. (2013). Older men's lay definitions of successful aging over time: The Manitoba Follow-up Study. <i>International Journal of Aging and Human Development</i> , 76(4), 297-232.	Longitudinal, open-ended survey	Canada (Manitoba)	N = 2,043 (n = 0 female) Age mean 78 at beginning of 10 year data collection period Race/cultural distribution not reported	21 main themes, 86 sub themes Main themes: 1. Leisure Activity and Interests 2. Happiness 3. Attitude 4. Health—General 5. Physical Activity 6. Relationships—Family 7. Coping, Adjustment, Acceptance 8. Being Productive or Contributing 9. Living and Dying 10. Life Experience 11. Independence 12. Health—Physical 13. Relationships—Companionship 14. Adaptation 15. Lifestyle 16. Health—Cognitive 17. Relationships—Society 18. Spirituality/Faith 19. Health System 20. Quality of Life 21. Relationships—Intimate

psychological well-being.^{24,25,33,35} Acceptance and peace of mind were also described as components of successful aging with respect to spirituality, indicating that some participants viewed a shift of control from self (e.g., with health behaviors) to a higher power.^{21,24,32,35} One study suggested that culture could influence older adults' decisions to either control or accept aspects of aging.³¹

Successful aging

While the term “successful aging” was used in many of the studies we reviewed, a theme of growing discomfort with the term “successful aging” emerged from earliest studies to 2015. Investigators appreciate that the term “successful aging” focuses on the positive aspects of aging²⁰ and causes research participants to contemplate their own aging rather than that of someone who may appear younger than their stated age.³¹ However, similar to the paradigm shift which occurred in the aging literature when researchers shifted from defining successful aging to eliciting definitions of successful aging from aging adults, some researchers are expressing displeasure with the term “successful aging”.^{20,24,31} The term “successful aging” may unintentionally connote normative ideas about “correct” aging, when in fact, evidence demonstrates that values about aging are highly individualistic.³¹ The term “successful aging” may exclude older adults, as well as those who are not “male, Anglo, well-educated, relatively affluent and healthy (p. 185)”.³¹ Amin explains that participants from underdeveloped areas were predominantly focused on obtaining three meals a day rather than typical Western priorities.¹⁹ Iwamasa and Iwasaki further note that “successful aging” may connote autonomy that is less valued by individuals espousing more collectivistic world views, such as those from non-Caucasian-American backgrounds.²⁴ Finally, Calasanti notes that the term “successful aging” may imply that the aging process should be controlled, which may result in individuals feeling burdened with the responsibility to “age well”.²⁰ Additionally, feelings of failure by individuals with less desirable aging outcomes may be attributable to shortcomings or failures of society, either by not supporting their aging via systemic biases, or by propagating unrealistic expectations of aging.²⁰ Throughout our review, we did not identify any studies that advocated for a particular replacement term for “successful aging.”

Frailty

Our search located only two studies that addressed public/lay perceptions of frailty.^{26,29} Data were not sufficient to support the identification of themes or patterns. However, the scant data that exist suggest that frailty may be perceived somewhat similarly to aging. Subjects in both studies described frailty holistically with physical, psychological and social elements,^{26,29} which is similar to how successful aging values are typically classified by participants. Participants in both studies also spoke about the value of health behaviors, particularly physical activity, for frailty prevention, and frail participants also discussed the inevitability of frailty, similar to the discussions of acceptance in the aging literature.^{26,29}

One notable difference between participants' discussions of frailty vs. aging is that frail participants often optimistically do not identify as frail, whereas aging is more difficult to deny.^{26,29} While people can gauge aging progress objectively by number of birthdays, judging one's own frailty status is more subjective, and older adults may rely on their own or others' perceptions of function, ultimately choosing an optimistic assessment of their ability or status.^{26,29} Participants were aware that they could become frail, but were reluctant to accept the label of frailty, even if they had significant limitations.^{26,29}

Minor theme

One minor theme emerged from our review but was not robust enough for inclusion in our conceptual model.

Effect of age on beliefs/perceptions

Several studies stratified participants by age and sought to describe any changes or trends in attitudes or beliefs about aging that occur as individuals' age. Researchers reported that older participants may not worry as much,¹⁷ may be more optimistic about aging,¹⁵ may value having a “positive spirit,”¹⁴ and may be more likely to accept rather than attempt to control changes of aging.^{21,34} In contrast, one study found that older adults were the most worried group in their sample,¹⁸ however, their definition of “older adults” was very broad (ages 60–91) and may account for the aberrant finding. Substratification might have revealed conclusions similar to other reports.

Discussion

In summary, the studies reviewed suggest that culture, knowledge of aging, and stereotypes of aging influence adults' beliefs and perceptions about aging. Adults determine individualized priorities about aging, and they subconsciously or consciously determine which parts of aging are controllable. When they perceive they can control an aspect of aging, and when that aspect of aging is important to them, they may participate in health behaviors intended to mediate aging or otherwise to meet their goal. When adults believe that an aspect of aging cannot be controlled, or when that specific aspect of aging is less important to them, they may aim to control their own peace of mind through acceptance. Our review suggests that older adults make both conscious and subconscious decisions about the controllability of aspects of aging, and that those decisions may change over time.

Our integrative review revealed that an awareness and understanding of the concept of frailty is essentially nonexistent, or at least rarely addressed by the specific term. Although this finding was not surprising, a noteworthy finding is that laypeople do not express an awareness that frailty predicts poor outcomes in aging adults, nor do they acknowledge their own personal vulnerability regarding frailty. Regarding perceptions about aging, priorities vary widely and reflect individual values of importance. For example, spirituality and religious beliefs are highly valued by many older adults and serve as coping mechanisms as they face end of life. For others, socialization and social experience are critical to maintaining well-being as they age; and for others, health behaviors (i.e., exercise, diet, sleep) are of utmost importance.

Moving forward, we are interested in advancing greater public awareness and understanding about aging and frailty from a scientific perspective, presented at appropriate comprehension and literacy levels. Recent publications decry the failure of health care systems to explain to patients that dying and frailty are normal final stages of life.^{37–39} Others call for greater public awareness about decline and mortality.^{3,40} The Frameworks Institute⁴¹ represents a collaboration among eight national aging-focused organizations that are committed to advancing public awareness about the aging process, needs of older adults, and perceptions about what it means to age in American society. Current societal attitudes encourage dissociation or “othering” of older adults. Society often fails to acknowledge that all individuals are on an aging pathway and that social contexts and public policy can have an influence on the aging process.

Research indicates that a shift in public understanding can build political will to create a more age-integrated society that will influence aging outcomes for the better.⁴² One approach is aimed at embracing a more dynamic public narrative that recognizes valuable contributions of older adults to society. Such a narrative highlights the experience, wisdom and insight that older adults contribute to societal vitality. Changes in outdated practices and policies related to employment, transportation, and housing are needed to ensure that everyone in society can stay involved and contribute to their full capacity.

Our team hopes to contribute to this national agenda. We recognize opportunities for individuals to gain agency and intentionality in their own lives through greater knowledge and understanding of the aging process. Ultimately, we subscribe to the idea that a more accurate understanding of human aging from a lay perspective, but incorporating scientific foundations, might facilitate optimal living, while moving towards end of life. Future research is needed to determine if increased understanding about aging and frailty leads to lifestyle change that improves quality of life, as well as greater intentionality and preparedness regarding end of life.

We identified limitations within our review. Although the inclusion of studies among non-American cultures^{18,24,28,30,31,33}

strengthens the evidence base, other ethnic cultures and groups remain unrepresented. Knowledge and perceptions of aging among many other geographic regions and ethnic groups remain unknown. One study noted the exclusion of persons with depression,²⁴ and no studies sought to elicit data from persons with mental health concerns. Given the prevalence of mental health concerns among adults and the possibility that these concerns could affect perceptions of aging, this may be a significant oversight. Similarly, studies did not address the inclusion of persons with significant chronic diseases and/or physical disabilities; these groups might differ from age-matched controls and would add value to the evidence base. Finally, studies aiming to distinguish perceptions of aging in the U.S. among demographic groups (e.g., gender, race, socioeconomic status) and historically underrepresented groups such as lesbian/gay/bisexual/transgender/queer (LGBTQ) persons could add richness to the literature base.

Conclusions

This integrative review advances understanding about public knowledge and perceptions about aging and frailty and provides a baseline for the evaluation of future efforts. A public health framework¹ for action on aging calls for particular attention to key areas, including: a focus on functional trajectories rather than disease or comorbidity; heterogeneity of experience in older age; inequities that underlie diversity; avoidance of ageist stereotypes; and empowerment of older people to shape challenges and social change associated with aging.¹ Advancement of these areas within public domains may contribute to a global paradigm shift on aging.

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