Clinical Interventions in Aging

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REVIEW

Aging Stigma and the Health of US Adults Over 65: What Do We Know?

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Abstract: This narrative review assessed the current state of research on aging stigma and health relevant to US adults ages 65 and older. We adopted a stigma framework to highlight aging stigma as a meaningful social construct and the complex ways in which it may be harmful for health. We identified 29 studies of various types (experimental, intervention, cross-sectional quantitative, longitudinal quantitative, and qualitative) published between 2010 and 2023 that investigated relationships between concepts related to aging stigma and health. Aging stigma was associated with poor short- and long-term health outcomes spanning cognition, psychological wellbeing, physical health, and hospitalizations. The premise that aging stigma is harmful to health was moderately well supported, while evidence that health influenced aging stigma was weak. Collectively, studies provided insight into several mechanisms through which aging stigma may affect the health of older US adults, while also highlighting areas for future research. Potential strategies for addressing aging stigma as a public health hazard were discussed.

Keywords: ageism, perceptions of aging, discrimination, prejudice, stereotypes, stereotype threat

Introduction

Stigma is increasingly recognized as a social and structural phenomenon relevant to health and health disparities. In a landmark article on the conceptualization of stigma, Link and Phelan[1] documented the growth of research on stigma, which was mentioned in the title or abstract of 19 Medline indexed articles in 1980 and increased to 114 articles in 1999. In a recent update to their search using PubMed, we found that stigma was mentioned in over 5000 articles in 2022. For the purposes of this article, we defined stigma as negative beliefs and stereotypes linked to socially constructed categories that serve as the basis for prejudice, discrimination, and the social marginalization of individuals and groups labeled with those categories.[1–3] Stigmatized people are often considered to be fundamentally different, which is used to justify social distancing and differential treatment. These limit access to opportunities and resources, result in loss of status, restrict self-determination and rights, and are associated with a range of negative outcomes including poor health. The concept of stigma has been applied to diverse sociodemographic characteristics, behaviors, lifestyle circumstances, and health outcomes. One category laden with negative stereotypes that has received limited attention in the stigma literature is old age. While research on the social construction of aging and old age has grown in the past 15 years, this work typically adopts the vocabulary and framework of ageism rather than aging stigma. While closely related, the theoretical conceptualization of stigma prompts consideration of some aspects of how our society thinks about and treats aging, older adults, and old age that are insightful in a review of what we know about aging stigma and how it may affect the health of US adults ages 65 and older.

An important point highlighted within the stigma framework is that while socially meaningful categories of human differences are widely believed to be biological attributes of individuals and groups, they are, in fact, socially constructed labels. Age is one of the most commonly cited demographic categories in the contemporary US. Yet beliefs and attitudes associated with age, particularly old age, are not limited to impartial discussions of chronological age. Rather, research shows that societal beliefs and attitudes about aging and older adults in the US are dominated by narrow, overwhelmingly negative stereotypes of how older adults should behave, what they should look like, and what are reasonable and appropriate

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expectations of aging.[4] Once categories of differences are established, they are generally taken for granted and become ingrained, normative, and widespread.[1] Old age has been described as the most deeply rooted, unquestioned, and socially acceptable stigmatized category affecting a sizable percentage of the US population.[5–7] Preschool aged children have been shown to recognize old age as an important social category and espouse ageist prejudices.[8] Variations in the aging stigma that children absorb early in life persist into adulthood and become increasingly self-relevant as people transition into the category of older adults, particularly as they receive reinforcement that they fit into the category of older adults.[9] Survey studies have reported that between 60% and 81% of older adults endorse internalized ageist beliefs.[10,11]

Another key characteristic of socially meaningful categories is that they are used to create social, and sometimes physical, distance from stigmatized groups.[7] This creates an "us versus them" dynamic. Older adults in the US are often physically segregated into age-specific housing and with specialized services and contexts designed for their age group. Many exit the workforce, voluntarily or not, which is a context characterized by intergenerational relations. Segregation of this type tends to minimize interactions and the development of interpersonal relationships across age categories, thereby reducing opportunities for aging stereotypes to be broken down.[12] Social distancing generally serves to disempower stigmatized groups, restricting access to economic, social, and political power.[1] Consistent with this, older adults are discriminated against in employment, housing, and healthcare.[13–15] In a nationally representative sample, over 93% of US adults ages 50–80 reported that they were affected by different examples of aging stigma on a regular basis.[10] Extent of age segregation and affected life domains vary within the older US adult population but become more common with increasing age (eg, on average, 80-year olds are more age segregated than 60-year olds).[7]

One dissimilarity between aging stigma and many other stigmatized categories is that aging stigma is only experienced during a portion of the life course once members of the dominant age group transition into the category of older adults. Consistent with many other stigmatized categories, however, the defining characteristics of old age are vague. There is a lack of consensus on when old age begins, whether at a specific chronological age or based on other indicators such as life stage, level of independence, or health status. The transition into the older adult category and accompanying ambiguity regarding its timing are believed to generate anxiety about being considered old.[16] Efforts to avoid or delay membership in this category may account for the $13 billion spent annually in the US on products and procedures in the anti-aging industry.[17] Further, there may be discrepancies in how people self-categorize their age group membership versus how others categorize them. Both are important, as they represent different mechanisms through which aging stigma is believed to affect health and wellbeing. Worthy of note, is that while stigmatized groups are, typically, socially marginalized across multiple domains, older adults collectively appear to retain some advantages associated with their former privilege, such as voting power and relatively low poverty rates.[18,19]

Negative outcomes experienced by stigmatized individuals and groups are generally assumed to be a consequence of the labels they have been assigned. Beliefs that poor health is inevitable in old age are pervasive and entrenched despite evidence to the contrary.[10] Strategies to improve health outcomes among older adults tend to be individually focused, such as providing access to affordable medical care, reducing isolation, and encouraging healthy behaviors. Yet, there is a growing body of evidence in support of the premise that many adverse health outcomes commonly found within the older US adult population are caused or exacerbated by internalized aging stigma and external sources of age-based discrimination.[5,9,10,20] Several recent reviews of quantitative research have documented that age-related beliefs, prejudices, and discrimination, measured in different ways and across diverse samples, were consistently associated with a broad array of adverse health outcomes.[21–23] This suggests an alternative strategy for improving health outcomes among the older US adult population characterized by reducing negative aging stigma within broader society, reframing narrative about aging and old age to be more diverse and positive, and developing practices and policies to prevent aging stigma from negatively affecting the health and wellbeing of older adults.[5,24]

Aging stigma is believed to affect health through multiple pathways.[1,25,26] Older adults who internalize aging stigma may have negative self-perceptions, poor psychological health,[27] and begin to embody negative stereotypes related to old age.[9] Feeling threatened by aging stereotype may generate psychological distress, cognitive load, and coping responses with ramifications for health.[12] External cues of aging stigma are ubiquitous, repeatedly reminding and reinforcing ageist prejudices and preventing older adults from disregarding the social importance of this stigmatized category.[28] Anticipated or actual incidents of age-based discrimination can activate cognitive, emotional, and physiological stress responses,

which, if frequent, are believed to accelerate aging processes and increase risk for chronic disease.[5,29,30] Older adults may delay or avoid healthcare seeking or receive suboptimal care, when aging stigma has negatively affected the quality of their interactions with healthcare providers and institutions. Even when older adults do seek healthcare services, they have been documented as not receiving medically appropriate procedures or treatments.[31] Finally, people categorized as older adults by others may experience negative prejudice and discrimination in social interactions and in their treatment by institutions and policies. Given the pervasiveness of aging stereotypes combined with the numerous ways in which they can affect health, it is likely that the health of most older adults is affected in some way, even if they are unaware of it. The magnitude of aging stigma for health, however, may vary based on self- and external categorization as old, how much individuals believe and are concerned about negative aging stereotypes, the frequency and severity of ageist cues, prejudice, and discrimination people encounter, and other factors.

The objective of this review article was to generate a narrative summary and synthesis of recent research providing insight on what we know about aging stigma and its relationships to the health of US adults ages 65 and older. This review complements and is distinct from recently published reviews on ageism and health[21–23] in several ways. First, we adopted a stigma framework to emphasize aspects of aging stigma as a social construct and potential mechanisms through which stigma may affect health warranting further recognition and consideration. Second, we focused narrowly on adults ages 65 and older residing in the US to minimize heterogeneity of the sample. Inconsistent definitions of old age and broad age groups included in aging stigma and health research have the potential to weaken, if not confound, findings on associations and mechanisms of aging stigma and health. Age 65 has become a commonly identified lower threshold for the older adult category in the US with the mid-60s marking average retirement age,[32] eligibility for older adult benefits and federal entitlement programs (eg, senior housing, Medicare, Social Security), and the age identified most often in social media, policy discussions, and research on older adults in the US. Adults ages 65 and older are more likely than those in their 50s and early 60s to self-identify and/or be categorized by others as older adults,[10,33] making aging stigma more salient to their lived experiences and health. As these represent two commonly identified mechanisms through which aging stigma is posited to affect health, associations between these concepts are expected to be more consistent and stronger among older age groups. We focused on studies within the US because, while old age has been identified as a meaningful social category and construct associated with poor health outcome across the world,[34] the prevalence of aging stigma, the magnitude of its effects on health, and its manifestations are believed to vary across countries and cultures.[21,34] Cross-national comparisons have reported differences in the prevalence of severe aging stigma, with the US demonstrating less aging stigma than many other countries in most, but not all, studies.[35–37] A US-specific focus allowed us to confirm that associations between ageism and health documented globally were applicable to the US and assess whether aging stigma in the US was associated with a wide range of health outcomes, as suggested in scoping reviews of the global literature. Potential mechanisms linking aging stigma and health may also be culture- and context-specific due to a nation's unique history, demographic profile and shifts over time, sociocultural values, institutions, and policies.[22] For example, aging stigma surrounding being unable to live independently and nursing home care are common in the US, perhaps stemming from traditional American cultural values of self-reliance; in countries where aging adults are expected to remain living in intergenerational households, aging stigma may revolve around other topics. The findings from the current review may inform future research and interventions on aging stigma and health tailored to address the specific needs, risk factors, and contexts experienced by US adults ages 65 and older. Finally, this review considered findings from diverse types of research studies, which, facilitated by the growth of recent research on aging stigma, allowed us to group articles and critically analyze research findings according to study type: experimental, intervention, quantitative, and qualitative. This approach facilitated consideration of the differing study type strengths, weaknesses, and contributions to our understanding of potential mechanisms linking aging stigma and health in the US. Further, grouping studies by type facilitates rapid identification of the most relevant studies for readers with different interests, while simultaneously providing a more comprehensive and multi-faceted review of relevant research than has been incorporated into previous reviews.

Materials and Methods

We conducted a comprehensive review of published empirical research examining relationships between concepts related to aging stigma and health among US adults over 65. Aging stigma variables were conceptualized as reflecting negative stereotypes, prejudices, and associated discrimination related to aging and older adults that were either invoked (eg, exposure to ageist primes or materials) or captured (self-reported survey data). Aging stigma could plausibly be measured at different levels of influence (eg, communitywide, in interpersonal relationships, or experienced or internalized by individual older adults, themselves) or among varied groups with influence on the lives of adults ages ≥65 (eg, healthcare providers, family members, or work colleagues). Health was conceived of as measures of cognitive health (memory, cognitive functioning), psychological wellbeing (mental health conditions, depressive symptoms, psychological distress, self-rated mental health, affect, and quality of life), physical health (types or number of diseases or chronic health conditions, functional health, physiologic health measures/biomarkers, self-rated physical health, and pain), hospitalizations, and health behaviors (eg, physical activity, smoking, and healthcare use). For this review, health measures had to focus on outcomes among adults ages ≥65. Relationships between aging stigma and health in any hypothesized direction (eg, aging stigma contributing to poor health or vice versa) were considered.

Between May and July 2023, we conducted a systematic literature search to identify relevant articles for inclusion composed of three phases (Figure 1). In phase one, we used PubMed to identify articles assigned the "ageism" Medical Subject Heading (MESH) term or containing related keywords such as age stigma, age prejudice, perceptions of aging, or age stereotypes in the title or abstract (see Figure 1 note for complete keywords list). The search was limited to articles published in English between 2010 (coinciding with the growth of research on ageism and health in PubMed) and 2023. We further restricted the search to articles MESH indexed for adults ages ≥65 ("aged") and the US or devoid of indexing by age group and/or geographic region. Finally, we omitted articles indexed as reviews and editorials. All components of this search strategy were combined using Boolean operators and executed as a single advanced search; therefore, there were no duplicate articles to eliminate.

In phase two, we screened all article abstracts and titles. We retained those meeting the inclusion criteria or indeterminant and excluded those not meeting the inclusion criteria. In phase three, we obtained the full-text versions of all remaining articles and triaged articles as eligible for inclusion, ineligible and therefore excluded, or indeterminant due to insufficient information. For this last group, we contacted article authors by email to obtain the information required to determine eligibility. Inclusion criteria for the literature review were as follows: (1) published in English; (2) published between 2010 and 2023 and available on PubMed as of June 29, 2023; (3) empirical studies with quantitative or qualitative data; (4) sample predominantly (>50%) adults ages 65 years and older or with discrete analyses for a ≥65 subsample; (5) sample predominantly (>50%) US residents; (6) minimum sample sizes of 30 for survey/experimental research and 10 for qualitative/intervention research; and (7) containing data analyses investigating linkages between concepts related to aging stigma and health.

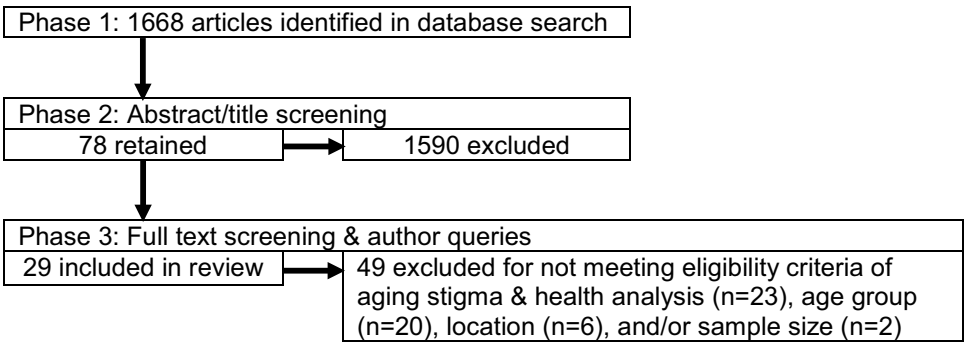

Figure 1 Flowchart of literature search and screening.

Notes: Search criteria were empirical studies published in English between 2010 and 2023 investigating relationship between aging stigma and health among US adults ages 65+. Phase 1 PubMed database search used the ageism MESH term and keywords of age stigma, ageism, age discrimination, age prejudice, stereotype threat, perceptions of aging, aging expectations, views of aging, age beliefs, age stereotyp*, aging self stereotyp*, aging stereotyp*, age-based stereotyp*, unequal ageing, aging anxiety, ageist, and age inequality. Keyword terms ending with * will capture all uses of the truncated term with any endings.

For each article, we extracted information on the study type (experimental, intervention, quantitative, qualitative), data source and study design, sampling methods, sample characteristics with an emphasis on descriptive statistics related to age, the ways in which aging stigma was operationalized, the health variable(s) assessed, and a summary of findings relevant to aging stigma and health. We relied on data analyses conducted by the article authors and their assessments of significant associations; when a threshold for determining significance was not indicated, $p<0.05$ was used. Given that the objective of this review was to provide a narrative summary and synthesis of recent research on aging stigma and health spanning diverse study types and disciplines with differing standards of rigor, we did not formally grade study quality, evaluate reporting biases, or conduct a meta-analysis. Instead, we provided detailed information related to many characteristics used to assess study quality and generalizability in the article table and narrative. Additionally, we considered the strengths and weaknesses of different types of studies and some individual studies in the discussion.

Results

Characteristics of Included Studies

We identified 29 articles meeting the inclusion criteria for this review (Table 1) including 10 experimental studies, 5 intervention studies, 12 quantitative studies, and 4 qualitative studies. Two studies bridged more than one study type (eg, experimental studies with an intervention and mixed methods studies).

Experimental Studies

Experimental studies were heavily represented in this review. In fact, three out of the ten experimental study articles summarized findings from two related experiments, resulting in a total of 13 distinct experiments and samples. Experimental studies employed comparisons to investigate relationships between aging stigma and health, including multiple (2–6) study arms with variations in the experimental and comparison/control conditions, older and younger adult subsamples (four studies), and data collected from participants before and after exposure to aging stigma. One experimental study also tested an intervention (discussed below) to reduce the negative consequences of aging stigma.[60] All experimental studies utilized regionally focused convenience samples composed of US adults in their target age range. Older adult sample sizes (or subsample sizes in studies comparing older and younger adults) ranged from 31 to 166, with an average of 81.6 participants. The approximate pooled average age for older adults across experimental studies was 71.5 years old, which closely mirrored the average ages reported in individual studies (±3.6 years).

All the experimental studies focused on how aging stigma may influence health, and not the reverse or potential reciprocal relationships. Most adopted a theoretical framework of stereotype threat[12] and explored different ways in which negative aging stereotypes can be communicated, including exposure to explicit stereotyped messages, implicit and subliminal stereotype activation, and contexts with high potential to generate stereotype threat among older adults. One study tested both experimental exposure to aging stigma and participant self-reported survey data gauging perceived aging stigma.[43] The primary health outcomes of interest in the experimental studies were short-term memory and/or cognitive functioning, which were assessed using standardized tasks completed in-person assessing recall and recognition (Figure 2). Other health outcomes examined in experimental studies included psychological wellbeing and stress-sensitive physiological indicators (eg, blood pressure and heart rate) (Figure 2).

Intervention Studies

Five intervention studies were identified, many of which shared characteristics with and built on the findings reported in experimental studies on aging stereotype threat. On average, intervention studies were published more recently than the other types of studies examined in this review. One intervention study reported on two related experiments. Another compared older and younger adult subsamples. All included between two and seven experimental and comparison/control arms. Four intervention studies had regional convenience samples, while the fifth used online platforms to recruit a convenience sample from across the US. Older adult sample sizes ranged from 56 to 763 with an average of 272.8 participants. The approximate pooled average age for older adults in intervention studies was 71.6.

Intervention studies also assumed a theoretical framework positing that aging stigma could negatively affect health, while testing a variety of approaches to disrupt this relationship. Reviewed interventions involved task success,[53] a

Table 1 Articles

Reference	Data Source and Study Design	Sampling Method and Sample Characteristics	Aging Stigma Variable	Health Variable	Main Findings Relevant to Aging Stigma and Health
Experimental Studies					
Barber & Mather[38]	2 experiments Both with 2 arms • stereotype threat • control (anti-stereotype threat) Health task data	Convenience samples recruited in California Exp 1: N=31 Ages 63–78, mean 70.4 Exp 2: N=64 Ages 61–86, mean 70.9	Exposure to stereotype threat related to memory and age Exp 1: fictitious news articles describing research confirming that memory declines with age[39] Exp 2: instructions indicated interest in age differences in memory, previous findings on age-based differences in memory, and had participants state their age aloud	Cognition: word recall (Exp 1 and 2), recognition tests (Exp 2)	Stereotype threat associated with • Mixed findings for memory-worse recall (Exp 1) but no difference in recognition accuracy (Exp 2) • Lower proportion of memory errors (Exp 1 and 2) • Better recall of items with penalties initially but difference not sustained. • No differences in recall of items with rewards (Exp 2)
Barber et al[40]	4 arms • Stereotype threat and rewards • Stereotype threat and penalties • Control & rewards • Control & penalties (control=anti-stereotype threat) • Comparisons within and between participants Health task and self-reported survey data	Convenience sample from California N=80 Ages 61–80, mean 69.5	Exposure to stereotype threat related to memory and age • Fictitious news articles describing research confirming that memory declines with age[39] • Told study designed to confirm that memory declines with age • Told own age puts participant at the older end of age range being tested	• Psychological well-being (anxiety, positive and negative affect) • Memory & cognition: word recall-4 and recognition tests	Stereotype threat associated with • Greater short-term anxiety • No differences in affect • Cognitive & recall impairments in presence of rewards but not penalties • Memory & cognition not mediated by perceived age stereotype threat or anxiety
Brubaker & Naveh-Benjamin[41]	2 experiments Exp 1 with 4 arms • Stereotype threat-older adults • Nonthreat-older adults • Stereotype threat-young adults • Nonthreat-young adults Exp 2 with 2 arms • Control-older adults • Control-young adults Comparisons within and between participants	Convenience samples from Missouri Exp 1: • Older adult subsample N=60 Ages 65–87, mean 72.5 • Young adult subsample N=60 Ages 18–25, mean 19.5 Exp 2: • Older adult subsample N=40 Ages 65–86, mean 74.0 • Young adult subsample N=40 Ages 18–23, mean 18.8	Exp 1: Exposure to stereotype threat related to memory and age • Instructions indicated interest in age differences in memory and previous findings of age-related declines in memory[42] Exp 2: No exposure to explicit stereotype threat or nonthreat • Instructions did not discuss age at all	Cognition: word and image item recall, associative (pairings), and recognition tests	Stereotype threat associated with • Worse associative memory and more errors among older adults (Exp 1) • No differences in item recall and errors (Exp 1) • Pattern documented in stereotype threat conditions both explicit (Exp 1 threat condition) and subtle (Exp 2 control, with no priming but context potentially activating stereotype threat)

Hess et al[43]	4 arms • Negative primes and high accountability • Negative primes only • Positive primes and high accountability • Positive primes only Self-reported survey data collected before aging stigma exposure, physiologic and health task data collected after	Convenience sample from North Carolina N=144 Ages 65–85, mean 72	• Priming with positive or negative aging stereotype via forming impressions of pictures and vignettes of happy or sad/grumpy older adults[44] • Expectations Regarding Aging (ERA-12) scale[45]	• BP • Heart rate • Cognition: letter recognition	• Negative stereotype primes and high accountability associated with elevated systolic BP initially but not sustained • Negative aging attitudes associated with elevated systolic BP among those with high intrinsic motivation • Positive stereotypes not associated with systolic BP • All aging stigma variables not associated with diastolic BP, heart rate, and memory
Krendl et al[46]	6 arms • Threat before encoding-older adults • Threat before retrieval-older adults • Control-older adults • Threat before encoding-young adults • Threat before retrieval-young adults • Control-young adults Health task data collected after aging stigma exposure	Convenience sample recruited from Boston • Older adult subsample N=92 Mean ages 75.1 • Young adult subsample N=77 Mean age 19.1	Subliminal priming with negative aging stereotypes in the form of brief exposure to negative age-related stereotype words masked by a string of consonants	Cognition: word encoding and retrieval (recognition)	Negative stereotypes associated with • Impaired memory accuracy among older adults when threat occurred prior to retrieval activity (vs prior to encoding or not at all) • Increased memory errors among older adults when threat occurred prior to retrieval activity (vs not at all)
Molden & Maxfield[47]	5 arms • Mostly positive stereotypes • Half positive/half negative stereotypes • Mostly negative stereotypes • All negative stereotypes • No stereotypes control Comparisons within and between participants Self-reported survey data collected at baseline and following aging stigma exposure	Convenience sample from western US N=80 Ages 61–90, mean 71.7	Priming with different proportions of positive and negative age-related stereotype words[48] prior to memory assessments	Psychological wellbeing (dementia anxiety, positive and negative affect)	Negative stereotypes associated with • Higher levels of dementia worry (higher proportions of negative stereotypes associated with more dementia worry than mixed, more positive, and control) • Especially when stereotypes were self-relevant (own age ≥ self-identified lower threshold of old age) • Not associated with change in affect

(*Continued*)

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Table 1 (Continued).

Reference	Data Source and Study Design	Sampling Method and Sample Characteristics	Aging Stigma Variable	Health Variable	Main Findings Relevant to Aging Stigma and Health
Popham & Hess[49]	4 arms • Positive stereotypes-older adults • Negative stereotypes-older adults • Positive stereotypes-young adults • Negative stereotypes-young adults Health task data collected following aging stigma exposure	Convenience sample from North Carolina • Older adult subsample N=62 Ages 65–83, mean 71 • Young adult subsample N=64 Ages 18–23, mean 19	Exposure to stereotype threat related to cognitive tasks and age (older adults only) • Instructions indicated interest in age differences in cognitive tasks, previous research findings that young people perform better than older adults, and asked to indicate age Exposure to stereotype threat related to academic discipline (young adults)	Cognition & memory: regulatory focus (speed/ accuracy in letter-canceling task), working memory tasks	Negative aging stereotypes associated with • Poorer regulatory focus due to slower task speed • Fewer errors • No difference in working memory
Smith et al[50]	4 arms • Stereotyped & warned • Stereotyped, not warned • Not stereotyped, warned • Control (not stereotyped or warned) Health task data collected following aging stigma exposure	Convenience sample from Massachusetts N=166 Ages 56–90, mean 70.6	Exposure to stereotype threat in the form of written passage on age-related declines in memory[51]	Cognition: (recognition test) with and without warning about deceptive nature of recognition test	Aging stereotypes associated with • More likely to make some types of errors but not others • Employment status and education moderated associations • Warnings did not reduce errors, perhaps due to other moderators
Tan & Barber[52]	3 arms • Stereotype threat • Stereotype alleviation • Intervention: prior to stereotype threat, read passage on Confucian filial piety values instilled in Chinese American young people Health task data collected following aging stigma exposure Data collected: 2016–2017 **also Intervention Study	Convenience sample of culturally Chinese adults from California N=114 Ages 55–84, mean 68.5	Exposure to stereotype threat in the form of instructions indicating interest in age-related memory decline, comparison to younger adults, and asked to indicate age prior to memory test (stereotype alleviation indicated test "age-fair").	Cognition: word recall	Stereotype threat alone associated with • Poorer memory performance compared to stereotype alleviation and intervention prior to threat arms (latter two did not differ)

Thomas et al[53]	2 experiments Both with 4 arms • Stereotype threat-older adults • No threat-older adults • Stereotype threat-young adults • No threat-young adults Health task data collected following aging stigma exposure	Convenience samples from Massachusetts Exp 1 • Older adult subsample N=62 Mean age 73.5 • Young adult subsample N=61 Mean age 19.4 Exp 2 • Older adult subsample N=66 Mean age 72.6 • Young adult subsample N=66 Mean age 20.7	Exposure to stereotype threat in the form of written passages reporting fictitious research that memory declines with age[51]	Cognition: recall (Exp 1 and 2), working memory-letter recall and math (Exp 1)	Stereotype threat associated with • Less accurate recall when able to skip questions among older adults (exp 1) but opposite or null effect among older adults under more challenging circumstances (exp 2) • No differences in working memory among older adults (exp 1)
Intervention Studies					
Geraci et al[54]	2 experiments Exp 1 with 3 arms • Intervention: verbal task success • Intervention: picture task success • Control (no success task) Exp 2 with 2 arms • Intervention: motor task success • Control (no success task) Health task and self-reported survey data	Convenience samples from Texas Exp 1: n=90 Ages 64–89, mean 73.5 Exp 2: n=56 Ages 65–90, mean 74.1	Implicit stereotype threat activation, as reflected in lexical decision task assessing speed forming words representing positive aging stereotypes, negative ones, and neutral words Stereotype threat questionnaire[55]	Cognition: word recall	Successful verbal and picture task completion, but not motor, were associated with higher subsequent recall, but this relationship was not mediated by stereotype threat activation or self-reported stereotype threat
Levy et al[56]	7 arms • Intervention: pairing negative and positive age stereotyped content with personified and enumerative information • Control: neutral content Self-reported survey data collected following intervention Data collected: 2020	Convenience sample of us residents from Lucid and Mturk online platforms • Older adult subsample n~763 Ages 65–106, mean 70.2 • Younger adult subsample n~827 Ages 18–64, mean 39.7	Intervention: messaging about real-life news stories published during COVID-19 pandemic. • First vignette reflected content with negative age stereotypes, positive age stereotypes, or neutral (not about older adults) and personified information (stories about older adults). • Second vignette reflected negative/positive/neutral content and enumerative information (statistics about older adults)	Psychological wellbeing (anxiety, peacefulness)	Negative age stereotypes intervention associated with: • More anxiety among older adults • Less peacefulness among older adults Positive age stereotypes intervention associated with: • Less anxiety among older adults • More peacefulness among older adults Personified & enumerative interventions with comparable associations with health variables

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Table 1 (Continued).

Reference	Data Source and Study Design	Sampling Method and Sample Characteristics	Aging Stigma Variable	Health Variable	Main Findings Relevant to Aging Stigma and Health
McDougall et al[57]	2 arms • Intervention: senior wise memory training • Control: health promotion curriculum Health task and self-reported survey data collected at baseline, 2- (post-intervention), 6-, 14-, and 26-month follow-up	Convenience sample from Texas N=265 Ages ≥65, mean 75 at baseline	• Intervention: senior wise memory training designed to build self-efficacy and reduce aging memory stereotype threat • Measure: stereotype threat related to memory/cognition and age measured using proxy of anxiety subscale of metamemory in adulthood questionnaire (MIA[58])	• Cognition: tests of verbal, visual, and everyday memory • Functional health (instrumental activities of daily living)	Stereotype threat at baseline associated with • Poorer baseline verbal memory, lower memory self-efficacy • Not related to changes in memory or functional health over time Intervention associated with • Decline in stereotype threat Stereotype threat change over time associated with • Verbal memory improvement in intervention group in stratified analyses but not moderation analyses (memory–arm interaction)
Menkin et al[59]	4 arms • Intervention: reduce negative age stereotypes message • Intervention: promote positive growth or maintenance with age message • Intervention: emphasize diversity of aging across domains message • Control: anti-aging stigma messages received post data collection Self-reported survey data collected immediately following intervention	Convenience sample from California & Illinois N=349 Ages 50–92, mean 72	• Intervention: brief anti-aging stigma messages • Measures: Views of aging (AgeCog physical losses and ongoing development subscales[60])	• Motivation to attend physically active programs • Motivation to attend other senior center activities (social, creative, cognitively engaging)	Anti-aging stigma intervention associated with • Greater motivation for physical activities among ages >71 only • Greater motivation for other activities among ages ≥84 • Lower motivation among ages ≤64 • Findings strongest among promote positive message arm No difference in views of aging

Tan & Barber[52]	3 arms • Stereotype threat • Stereotype alleviation (control) • Intervention: prior to stereotype threat, read passage on Confucian filial piety values instilled in Chinese American young people Health task data collected following exposure to aging stigma Data collected: 2016–2017 **also experimental study	Convenience sample of culturally Chinese adults from California N=114 Ages 55–84, mean 68.5	Exposure to stereotype threat in the form of instructions indicating interest in age-related memory decline, comparison to younger adults, and asked to indicate age prior to memory test (stereotype alleviation indicated test "age-fair").	Cognition: word recall	Stereotype threat alone associated with • Poorer memory performance compared to control and those receiving intervention prior to threat (latter two did not differ)
Quantitative Studies					
Andrews et al[61]	Longitudinal study with data from Baltimore Experience Corps randomized controlled trial of volunteering at elementary schools vs elsewhere Self-reported survey collected at baseline, 1- and 2-year follow-up	Convenience sample from Maryland N = 446 Ages ≥60, mean 66.2 at baseline	Expectations Regarding Aging (ERA-12) scale[45] with 3 subscales: physical health, mental health, cognitive functioning	Physical activity: minutes/week of moderate and vigorous physical activity	• ERA & physical activity over 2 years not associated in mixed sex analyses controlling for covariates and arm. • More positive ERA associated with more physical activity among women but not men in stratified analyses but not moderation analyses (ERA–sex interaction) • More positive ERA physical health subscale scores associated with more physical activity • ERA mental health and cognitive functioning subscales not associated with physical activity • ERA-physical activity relationship not moderated by time

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Table 1 (Continued).

Reference	Data Source and Study Design	Sampling Method and Sample Characteristics	Aging Stigma Variable	Health Variable	Main Findings Relevant to Aging Stigma and Health
Han[62]	HRS Self-reported survey Longitudinal data collected: 2008, 2010, 2012	Subsample from nationally representative sample N=3382 Ages 65–96, mean 73.8 at baseline	Attitudes Towards Own Aging scale from the Philadelphia Geriatric Center Morale Scale[63]	• Psychological well-being (depressive symptoms) • Chronic health conditions • Functional health (limitations)	Negative aging attitudes at baseline (T1) associated with • Greater functional limitations (T2 only) and more depressive symptoms (T2 & 3) over time • Stronger association between chronic illnesses (T1) and later depressive symptoms (T2 only) (moderation) • Not associated with differences in association between chronic illnesses (T1) and later functional limitations (T2 & 3) (moderation)
Levy et al[64]	Precipitating Events Project Longitudinal self-reported interview data (baseline) and home assessments (every 18 months) for 129 months Data collected: 1998–2008	Convenience sample from Connecticut with no limits to activities of daily living at baseline and some disability at follow-up N=598 (79.3% of cohort) Ages ≥70 at baseline	Nature of age stereotypes based on free response descriptors of old people (scores dichotomized as positive/negative relative to mean)[65]	Functional health (activities of daily living)	Negative age stereotypes at baseline associated with • Faster rate of decline in activities of daily living • Lower likelihood of recovery from disability
Levy et al[66]	National Health and Resilience in Veterans Study Longitudinal self-reported survey data Data collected: 2011, 2013, 2015, 2018	Nationally representative sample of US armed forces, reserves, and National Guard veterans N=1373 Ages 55–96, mean 68 at baseline	• Expectations Regarding Aging (ERA-3) scale[45,67] • Palmore's Ageism Survey[68] • Age attribution-attribute bad health events to age[69]	Chronic pain	Negative age stereotypes at baseline associated with • Chronic pain (higher incidence, likelihood of having, and earlier development) • Age stereotype-chronic pain association fully mediated by age attribution More reported age discrimination associated with • chronic pain
Levy et al[70]	Precipitating Events Project Longitudinal self-reported survey data (baseline and 10 years later) and hospitalization and stressful bereavement data (monthly interviews)	Convenience sample from Connecticut N=231 Ages ≥70, mean 76 at baseline	Nature of age stereotypes based on free response descriptors of old people[65]	• Hospitalization • Psychological well-being (stressful bereavements) **health as independent variable	Hospitalization associated with • No change in negativity of age stereotypes Stressful bereavements associated with • No change in negativity of age stereotypes Negative age stereotypes associated with • Greater likelihood of hospitalization over 10 years

Levy et al[11]	Integration of: 1. Systematic review and meta-analysis to predict impact of ageism on 8 health conditions 2. Health condition prevalence and healthcare spending in 2013	Predictions applied to US adult population ages ≥60	Ageism, captured with 3 measures: • Attitudes Towards Own Aging scale from the Philadelphia Geriatric Center Morale Scale[63] • Expectations Regarding Aging (ERA-3) scale[45] • Everyday Discrimination scale attributed to age[71]	• Healthcare costs • Chronic health conditions	Ageism associated with • $63 billion in excess US healthcare costs during 2013 • 17 million cases annually in excess US health conditions
Levy et al[72]	HRS Longitudinal self-reported survey data (2008/2010), cognitive assessments (every 2 years for 4 years), and salivary APOE ε4 biomarker (2006/2008)	Subsample from nationally representative sample without dementia at baseline N=4765 Ages ≥60, mean 72 at baseline	Attitudes Towards Own Aging scale from the Philadelphia Geriatric Center Morale Scale[63]	Cognition: assessment and APOE ε4 gene (associated with increased dementia risk)	Negative age beliefs at baseline associated with • Greater likelihood of developing dementia over 4 years • Greater likelihood of developing dementia among those with APOE ε4 gene
Levy et al[73]	HRS Longitudinal self-reported survey data (2008/2010), cognitive assessments (every 2 years for 8 years), and salivary APOE ε2 biomarker (2006/2008)	Subsample from nationally representative sample N=3895 Ages 60–97, mean 71.1 at baseline	Attitudes Towards Own Aging scale from the Philadelphia Geriatric Center Morale Scale[63]	Cognition: cognitive assessment and APOE ε2 gene (associated with better cognition)	Negative age beliefs at baseline associated with • Worse cognition • Suppressed benefit of APOE ε2 gene biomarker for cognition (moderation analysis) • Greater effect size on cognition than biomarker
Levy & Slade[74]	HRS Longitudinal self-reported survey data and cognitive assessments every 2 years from 2008–2020	Subsample from nationally representative sample N=1716 Ages ≥65, mean 77.8 at baseline	Attitudes Towards Own Aging scale from the Philadelphia Geriatric Center Morale Scale[63] (scores dichotomized as positive/negative relative to median)	Cognition (mild cognitive impairment)	Negative attitudes toward aging at baseline associated with • Lower likelihood of recovery from baseline cognitive impairment, regardless of severity • Slower cognitive recovery • Higher prevalence and risk of developing mild cognitive impairment during 12-year study period

(*Continued*)

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Table 1 (Continued).

Reference	Data Source and Study Design	Sampling Method and Sample Characteristics	Aging Stigma Variable	Health Variable	Main Findings Relevant to Aging Stigma and Health
McDarby et al[75]	Cross-sectional mixed methods study embedded within larger longitudinal study Brief semi-structured qualitative interviews and quantitative self-reported survey data Data collected: 2021 **Also Qualitative Study	Convenience sample from Midwestern US N=73 Ages 65–89, mean 73.3	• Ratings of offensiveness, caring for older adults, pity for older adults, and attribution to age for 1) media coverage related to older adults and pandemic (including exposure to 5 stories exemplifying potential aging stigma); and 2) examples of age-focused behaviors • Interview questions probing perceptions of media portrayals of older adults during COVID-19 pandemic, influence of media and pandemic on health concerns and own/others' focus on participants' age	• Psychological well-being (quality of life) • Adherence to COVID public health recommendations	Differential treatment related to age and media messaging related to COVID-19 pandemic and older adults, sometimes interpreted as benevolent ageism • Appreciated by some and offensive to minority (qual and quant) Increase awareness of age (own/others') made feel • Older, "othered", salience of mortality, appreciate/enjoy life more (qual) Media attention on older adults and pandemic made feel • Vulnerable to illness, invisible and stereotyped, persevere with life despite public health/other recommendations, which disregarded (qual)
Steward & Hasche[76]	HRS Self-reported survey data Cross-sectional data collected: 2016	Nationally representative community residing sample N=4561 Ages≥50, mean 67.7	Self-perceptions of aging, as indicated by adapted Attitudes Towards Own Aging scale from the Philadelphia Geriatric Center Morale Scale[63] & Berlin Aging Study[44]	Physical activity, frequency **health as independent variable	Exercise associated with • Less negative perceptions of aging • Relationship partially mediated by personal agency
Voelkner & Caskie[77]	Health task data and both self-reported survey data Cross-sectional data collected: 2019	Convenience sample of US residents from MTurk online platform N=215 Ages 66–90, mean 69.1	• Awareness of Age-Related Change scale (AARC-50[78]) across 5 domains including cognition • Palmore's Ageism Survey[68]	Cognition: perceived functioning, immediate and delayed recall tasks, inductive reasoning (3 tasks) **health as independent variable	Better memory associated with • Lower perceived age-related losses (overall and cognitive) • Experiences of aging stigma did not mediate Better reasoning associated with • Lower perceived age-related losses (overall and cognitive) • Lower perceived age-related gains (overall and cognitive) • Experiences of aging stigma mediated association with losses but not gains

Qualitative Studies					
Makris et al[79]	Precipitating Events Project Semi-structured interviews (n=23) and focus groups (n=16)	Convenience sample of adults with restricting back pain from Connecticut & New York N=93 Ages ≥ 65, median 83	Belief that restrictive back pain is inevitable with age held by participant (internalized aging stigma) and/or healthcare providers (ageist prejudice and discrimination)	• Motivation to seek healthcare • Use of treatments • Chronic pain and restrictions	Prejudices about the age-related inevitability of back pain (self and provider) associated with • Limited motivation to seek healthcare and/or use treatments, resulting in ongoing chronic pain and restrictions
Mayo et al[80]	Semi-structured focus groups (n=2) Data collected: 2019	Convenience sample from New England N=27 Ages 60–86 Stratified by generation-baby boomer (N=17) and silent (N=10)	Perceptions of aging stigma and its harms	• Use of medical care • Psychosocial well-being (quality of life, social isolation, self-esteem)	Aging stigma associated with • Negative public and personal health outcomes such as poor quality and avoidance of medical care, social isolation, poor self-esteem, anxiety about dependence and loss, disrespect
McDarby et al, 2022[75]	Cross sectional mixed methods study embedded within larger longitudinal study Brief semi-structured qualitative interviews and quantitative self-reported survey Data collected: 2021 **Also Quantitative Study-Cross Sectional	Convenience sample from Midwestern US N=73 Ages 65–89, mean 73.3	• Interview questions probing perceptions of media portrayals of older adults during COVID-19 pandemic, influence of media and pandemic on health concerns and own/others' focus on participants' age • Ratings of offensiveness, caring for older adults, pity for older adults, and attribution to age for 1) media coverage related to older adults and pandemic (including exposure to 5 stories exemplifying potential aging stigma) and 2) examples of age-focused behaviors	• Psychosocial well-being (quality of life) • Adherence to COVID public health recommendations	Differential treatment related to age and media messaging related to COVID-19 pandemic and older adults, sometimes interpreted as benevolent ageism • Appreciated by some and offensive to minority (qual and quant) Increase awareness of age (own/others') made feel • Older, "othered", salience of mortality, appreciate/enjoy life more (qual) Media attention on older adults and pandemic made feel • Vulnerable to illness, invisible and stereotyped, persevere with life despite public health/other recommendations (qual)
Wallhagen, 2010[81]	Longitudinal dyadic study In-depth interview data collected at baseline, 3- and 12-month follow-up	Convenience sample of older adults from California with hearing loss and communication partners N=91 dyads at baseline • Older adult subsample ages 60–93, mean 73 • Partner subsample ages 19–92, mean 64.2	• Perceived stigma of hearing loss associated with old age • Internalized aging stigma • Hearing loss/aging stigma reinforced by healthcare providers, partners, and hearing aid marketing	• Seeking of healthcare and assistive devices (hearing test, hearing aids) • Use of hearing aids • Psychosocial well-being (quality of life related to disability, self-esteem)	Stigma of age-related hearing loss associated with • Resistance & delays in getting hearing tested • Less likely to obtain hearing aids • Underuse of hearing aids • Reduction in quality of life (discomfort with identification as disabled, deterioration, self-esteem)

Note: Studies representing more than one study type listed in all relevant sections.
Abbreviations: BP, blood pressure; HRS, Health and Retirement Survey.

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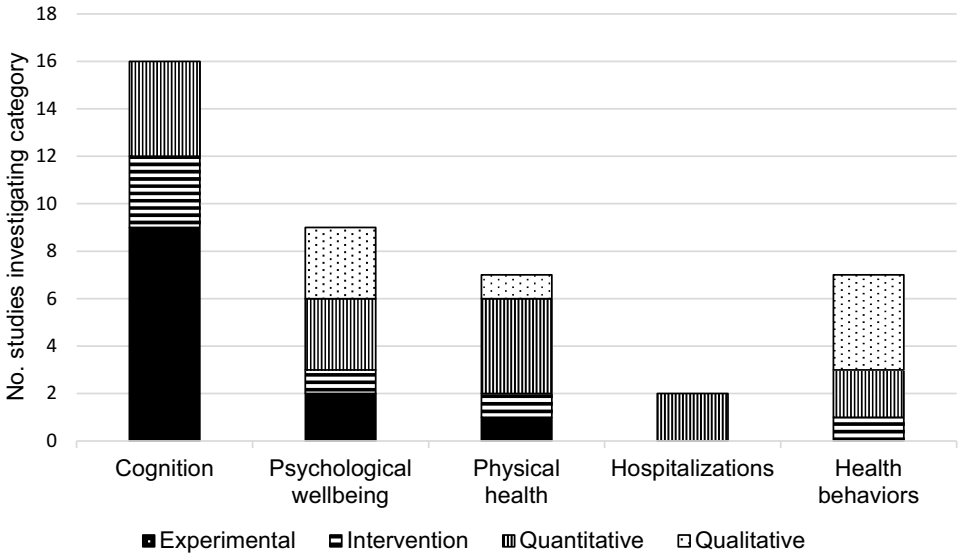

Figure 2 Health categories investigated by study type.
Notes: Sum of studies investigating a specific health category in the figure may be higher than the actual number, as studies representing more than one study type (2) are depicted more than once.

memory training course,[56] exposure to positive age stereotypes and aging messaging,[55,58] and reinforcement of cultural values inconsistent with dominant US attitudes and treatment of older adults.[60] All interventions focused on change at the intrapersonal level and sought to alter individual beliefs, perceptions, and skills theorized to affect health outcomes directly (eg, via internalized aging stigma) or indirectly (eg, promoting self-efficacy, self-esteem, or skills, which were theorized to buffer against or reduce aging stigma). Four of the reviewed interventions were brief (completed within ≤1 hr), low cost, relatively simple to implement, and well suited for translation to different delivery modes and target populations. The memory training program[56] was longer (2 months), more time and resource intensive, and complex, while providing more contact hours, likelihood of long-term effects, and potential for benefits outside those prioritized in the intervention (eg, social relationships and changes to aging expectations in the community). Intervention studies operationalized aging stigma as stereotype threat (both explicit and implicit) and negative aging stereotypes, which were either experimentally manipulated or assessed using a wide range of survey instruments (Stereotype Threat scale,[54] Metamemory in Adulthood questionnaire,[57] and Views of Aging scale[59]). As with the experimental studies, health outcomes were predominantly short term in nature and included memory, psychological wellbeing, functional health, and motivation to be active (Figure 2). Outcome health data for the four brief interventions were collected immediately. The memory training examined outcomes over 24 months of follow-up.

Quantitative Studies

Quantitative studies were described in the largest portion of articles relevant to this review. There were three cross-sectional studies (one of which employed mixed methods[75]), eight longitudinal studies with data collection spanning between 2 and 12 years (average 7.1), and one study that applied meta-analysis findings to predict national health and healthcare costs attributable to ageism.[11] Nearly all of these studies utilized self-reported survey data, many in combination with other forms of linked data from task performance, interviews, cognitive assessments, genetic material, home-based assessments, and Medicare and mortality records. Half the studies analyzed data collected as part of large, nationally representative survey studies collecting longitudinal health data—five studies used the Health and Retirement Survey (HRS[82]) and one study used the National Health and Resilience in Veterans Study (NHRVS[83]). Two studies used longitudinal data from the Precipitating Events Project,[84] which followed a regional cohort of 754 community-residing adults ages ≥70 years for 10 years, and three used data collected from smaller regional[61,75] and national[77] convenience samples. Sample sizes were larger than those documented among other study types, ranging from 73 to 4765 participants and averaging nearly 2000. Quantitative study findings were based on approximately 7500–12,000 unique participants

across studies. The pooled average age at baseline, not accounting for duplicates, was slightly younger than in other study types, at 69.3 years old.

Nine quantitative studies assumed the theoretical orientation that aging stigma may affect health. Two cross-sectional studies[76,77] hypothesized that health may influence aging stigma, while one longitudinal study[70] considered causality in both directions by investigating the temporality of aging stigma and health variables. Aging stigma was largely indicated by self-reported responses to survey measures designed to assess perceptions of aging and age-based discrimination: all five HRS studies used the Attitudes Toward Own Aging scale;[63] two studies used the Expectations Regarding Aging scale;[45] two used Palmore's Ageism Survey;[68] and one used the Awareness of Age-Related Change scale.[78] The study estimating the impact of ageism on national health outcomes and healthcare costs[11] relied on three measures related to aging stigma: Attitudes Towards Own Aging,[63] Expectations Regarding Aging,[45] and the Everyday Discrimination scale attributed to age.[71] Three studies integrated activities to gauge aging stigma (rating of free response descriptors of older adults, evaluation of messages). Quantitative studies examined a broad array of health conditions including those investigated in experimental studies and others: memory and cognitive functioning, psychological wellbeing, functional health, pain, chronic health conditions, healthcare costs, hospitalizations, adherence to health recommendations, and physical activity (Figure 2). Longitudinal studies, in particular, were able to investigate long-term health outcomes, temporality of aging stigma relative to health outcomes, and associations between aging stigma and health changes over time (eg, incidence rates and recovery/decline).

Qualitative Studies

Four qualitative studies met the criteria for inclusion in the review, one of which employed mixed methods. Three studies were cross-sectional, and one was longitudinal with data collected over 12 months.[81] Data were derived from semi-structured, individual interviews (two studies) and focus groups (two studies). All four used regional convenience samples, some representing cohorts with specific health issues or from different generations. One study was part of the Precipitating Events Project.[84] Older adult samples for these studies had between 27 and 93 participants and a mean of 71. The average age for participants across qualitative studies could not be estimated, due to variations in descriptive statistics provided, but was generally older than the average age in other study types.

Assessment of aging stigma across qualitative studies varied widely but generally included expressions of internalized aging stigma, often linked to specific health conditions, perceptions of ageist prejudice and cues, and experiences of age-based discrimination. Health variables investigated in qualitative studies included aspects of psychological wellbeing, physical health outcomes, and various health behaviors (Figure 2).

Summary of Findings on Aging Stigma and Health

Overall, experimental and intervention study findings provided evidence that aging stigma, most often investigated in the form of stereotype threat, was associated with poor short-term health outcomes that fluctuate within a relatively short timeframe (ie, memory, cognitive functioning, psychological wellbeing, and motivation) among US adults ages 65 and up. This held true for aging stereotype threat activated in explicit, subtle, and contextual ways. Findings were complex, in that aging stereotype threat was associated with poorer memory and cognitive performance of some kinds, but not others, and differences were context dependent (eg, level of challenge, presence of penalties or rewards). Tests of theorized intervention models of change were often not substantiated, even if many were successful in achieving the desired end-results. For example, scores on aging stigma survey scales did not mediate the relationship between an intervention seeking to reduce aging stigma and health.[53] In another study, the intervention was associated with anticipated outcomes for some groups but had no effect or was associated with undesirable outcomes in other groups.[58]

In cross-sectional and longitudinal quantitative studies, negative aging stigma was consistently associated with poor health outcomes. This held true for studies using variables representing many dimensions of aging stigma including stereotype threat, internalized aging stigma, perceptions of ageist cues and prejudices, and experiences of age-based discrimination. This was also true for studies investigating diverse health outcomes ranging from cognition and mental health, which were well represented in experimental and intervention studies, to chronic pain, functional health, and specific chronic illnesses. Aging stigma was estimated to account for 17 million excess health conditions and $63 billion

in excess healthcare costs annually in the US.[11] Qualitative studies reported similar findings, with participants generally indicating that aging stigma negatively affected their psychosocial wellbeing, chronic pain levels, and hearing.

Regarding aging stigma and the health behaviors of older adults, study findings were mixed. Quantitative studies generally did not find that aging stigma predicted health behaviors over time, specifically, physical activity levels. Qualitative studies, in contrast, made a strong case that aging stigma caused people to avoid and/or delay healthcare seeking and use of medical treatments and assistive devices. These circumstances were described as resulting in or putting individuals at risk for poor health outcomes.

Collectively, research reflecting all study types provided evidence in support of the premise that negative aging stigma may be harmful to health. The converse, which was only investigated in three quantitative studies,[70,76,77] was not consistently supported and not at all supported in the single longitudinal study examined.[70]

Discussion

This narrative review complements and adds to the existing literature investigating linkages between the social construct of aging and health by marshalling the rich conceptualization and literature on stigma, while also focusing on research conducted with US adults ages 65 and older, as this age group is believed to be at risk for both experiencing aging stigma and its ramifications for health. Findings from 29 articles reflecting a range of study types provided moderate support for the premise that negative aging stigma is associated with a variety of poor short- and long-term health outcomes spanning cognition, psychological wellbeing, physical health, and hospitalizations among US adults ages ≥65. This was generally consistent with the findings of other review articles assessing associations between concepts related to aging stigma and health among more age and geographically diverse samples.[21–23]

Research investigating aging stigma and cognitive health represented the largest proportion of studies meeting the eligibility criteria for the current review (a health category investigated in 52% of articles) and was more heavily represented than in other reviews on ageism and health (eg, 15%[22]). This may have been a result of our inclusion of a broader range of study types. Experimental study designs, which were included in our review but often have not been included in others, are well suited to tests assessing cognitive functioning. Additionally, both cognition and stereotype threat are major areas of interest in the field of psychology, which frequently employs experimental study designs. Experimental and some intervention studies demonstrated the immediate effects of stimulating stereotype threat in explicit, subtle, and contextual ways on older adults' cognitive status, as well as on their short-term psychological health and stress-sensitive physiological indicators. These studies provided additional evidence that aging stereotype threat may be a mechanism affecting older adult health. However, the short follow-up periods, small convenience samples, and controlled laboratory environments characteristic of these studies limit our capacity to draw conclusions about potential long-term health effects of aging stereotype threat among diverse community samples. Further, findings from studies investigating associations between aging stereotype threat and cognition were the most nuanced and challenging to synthesize. Collectively, they suggested that while aging stigma may affect short-term memory and cognitive functioning, effects were irregular—applying to some forms of cognition but not others and only under some conditions. These nuances may account for why the theorized mechanisms of change for intervention studies focused on aging stigma and cognition were not well substantiated. This review also considered three quantitative studies on cognition, all longitudinal, based on the HRS dataset and conducted by the same research team. While a strength of the experimental studies was providing insight into specific mechanisms through which aging stigma may affect health, these quantitative studies provided evidence that aging stigma may be a risk factor for adverse cognitive outcomes over time in large, national samples of older adults. These results strengthen the case that aging stigma may have severe cognitive consequences that are generalizable across the US.

Slightly less than a third (28%) of reviewed studies investigated associations between aging stigma and psychological wellbeing. Affect or mood, measured in two experimental studies using the Positive and Negative Affect Scale,[85] was not associated with aging stigma. In contrast, more specific indicators of psychological wellbeing such as anxiety and depressive symptoms were associated with higher levels of aging stigma in studies of all types, cross-sectionally and longitudinally. Participants in qualitative studies specifically noted ways in which their psychological wellbeing was affected by aging stigma, predominantly, but not exclusively, in negative ways. Collectively, findings from studies on

psychological wellbeing suggest that aging stigma may produce fairly specific psychological responses rather than a broad range of negative emotions. Additionally, findings suggest that aging stigma may contribute to poor psychological outcomes via multiple pathways— short term, via stereotype threat, and long term, due to internalized negative beliefs about aging and age-based discrimination.

Physical health was investigated in 24% of included articles. Quantitative studies were particularly well represented, which was fitting given that many physical health outcomes do not demonstrate variations or change over the short timeframes characteristic of experimental studies and many of the reviewed intervention studies. Across quantitative and qualitative studies, aging stigma was associated with adverse physical health without exception, with investigated outcomes ranging from functional health and chronic pain to chronic health conditions and diseases. Findings from most of these studies were based on high-quality data collected as part of large-scale, longitudinal studies (eg, HRS, NHRVS, and Precipitating Events Project). Major contributions of the quantitative studies were that their findings documented temporal relationships between aging stigma and physical health outcomes arguably generalizable to the overall US older adult population and strengthened the argument that aging stigma contributes to or perhaps even causes poor health outcomes. These studies assessed varied forms of aging stigma (negative internalized beliefs about aging, aging stereotypes, perceptions of others' prejudices surrounding aging, and experiences of age-based discrimination), which alluded to multiple pathways through which aging stigma may influence health, but without the specificity that could be investigated using other study types. One experimental study that assessed physical health examined physiologic indicators that fluctuate over short time periods—blood pressure and heart rate —and particularly in response to acute stressors.[43] Findings, however, were mixed, making it unclear whether fight or flight stress responses represent another potential mechanism linking aging stigma and health. One intervention study examined functional health as a secondary outcome;[56] null findings for this outcome may have reflected a mismatch between the intervention and this outcome. Two quantitative studies concluded that aging stigma was implicated in greater hospitalization risk and costs.[11,70]

In the current review, evidence related to aging stigma and health behaviors was mixed, though whether relationships between these concepts were detected appeared to be patterned by behavior and study type. In three intervention and quantitative studies examining aging stigma and physical activity, associations were inconsistent. Three qualitative studies reported that concepts related to aging stigma were identified by participants as negatively affecting healthcare seeking and the use of medical treatments. In a mixed methods study, participants were described as distancing themselves from ageist stereotypes during the COVID-19 pandemic by persevering with life, which included disregarding public health recommendations.[75] The mixed findings regarding aging stigma and health behaviors in the current review deviate from other reviews on ageism and health,[21–23] which reported consistent relationships (largely from quantitative studies) between aging stigma and a more diverse range of health behaviors.

Collectively, the diverse types of research studies included in the current review provided fairly consistent and robust evidence that aging stigma may be harmful for a variety of health outcomes, with mixed findings for health behaviors, among US adults ages 65 and older. Experimental and intervention studies built the case that aging stigma may be associated with short-term health outcomes, while cross-sectional and longitudinal quantitative and qualitative studies documented relationships between aging stigma and long-term health outcomes. Examined studies operationalized aging stigma in a wide variety of ways—priming with ageist cues; invoking stereotype threat; and survey scales capturing attitudes, expectations, stereotypes, and discrimination related to old age and aging—that did not demonstrate any identifiable patterning in their associations with health (eg, no specific forms were more consistently associated with health or certain health categories than others). Experimental and longitudinal quantitative studies provided evidence suggestive of causality and direction of effect, especially the few studies with the objective of investigating causality in both directions.[70] Overall, included studies provided evidence in support of the dominant viewpoint—that aging stigma affects health, while support for health as a potential determinant of aging stigma (examined in only three studies) was weak. These findings are consistent with both theoretical and empirical research, which posit that while relationships between aging stigma and health are likely bidirectional, the effect of aging stigma on health is greater than the opposite.[9,59,86,87] Finally, a limited number of intervention studies have demonstrated the potential for mitigating the harms of aging stigma on health. The brevity and low resource requirements of several of these interventions demonstrate the potential cost-effectiveness of initiatives to combat aging stigma and potential for even larger impact of initiatives with greater dose or multilevel strategies.

Implications for Future Research and Interventions

One recommendation for future aging stigma and health research is the inclusion of more descriptive data on participant ages, as well as sub-analyses conducted with narrower age ranges of older adults (eg, 10-year spans). Both exposure to aging stigma and health status vary widely among older US adults, which is a vague category applied to people with ages spanning multiple decades. Disparities in aging stigma are generally patterned by chronological age, with adults at the older end of the old age category reporting more frequent and different kinds of aging stigma compared to those at the younger end.[33] More research is needed to determine whether aging stigma differentially impacts the health of age subgroups within the older population. Further, the typical descriptive data on age included in research articles (ie, mean age, standard deviation, range) may be insufficient for clinicians, service providers, and policy-makers seeking to develop evidence-informed interventions tailored to enhance the health of specific age subgroups of older US adults. For example, it seems ill-advised to assume that study findings on aging stigma and cognition conducted among 50 years olds would be applicable to centenarians.

Exposure to aging stigma is determined by whether individuals are categorized as older adults. Aspects of visible appearance associated with aging (eg, hair color, skin characteristics, movement, and use of assistive devices) are commonly relied upon in broader society to estimate age. How old they look may also affect how older adults categorize themselves. More insight is needed on how aspects of visual appearance relate to aging stigma and, therefore, indirectly to health. Further, efforts to alter one's appearance through the use of anti-aging products and procedures are widespread in the US. Future research is warranted to determine whether these efforts are effective at reducing experiences of aging stigma in greater society and how they affect internalized stereotypes and beliefs about aging.

Stigma is believed to negatively affect health and other outcomes in large part because it is reproduced and maintained within society.[1] While not represented in this review, measures and study designs that capture the effects of aging stigma within broader society, the media, communities, and institutions are needed to provide a more comprehensive understanding of how aging stigma may affect health outcomes within the older US adult population. Combining this with current assessments of aging stigma at the individual level would facilitate investigation of the potentially synergistic effects of aging stigma across multiple levels of influence, life domains, and mechanisms.

The current study demonstrated the benefit of synthesizing findings from diverse study types for elucidating mechanisms linking aging stigma and health. Future research employing cross-disciplinary collaborations integrating multiple study types has significant potential to further advance our understanding of mechanisms linking aging stigma and health. This strategy would marshal the strengths and insights provided by different study types. This may facilitate narrowing the current theoretical and empirical gaps surrounding how acute exposures to aging stigma and associated short-term responses have a cumulative effect on the body and increase risk for long-term health outcomes such as chronic disease.[5,29,30]

While the current review only identified a small number of predominantly brief, individually focused interventions to reduce the potential harms of aging stigma on health, initiatives to raise awareness about aging stigma and its harms, reframe narrative about aging and older adults, and reduce age-based discrimination have grown in recent years. These initiatives may benefit from implementation science and systematic evaluations. Taking advantage of these areas of expertise would help identify and test theorized mechanisms of change, some of which were not well articulated, justified, or supported in the reviewed articles. This work could be marshalled for ongoing quality improvement, identification of best practices, and sharing of key elements with others interested in launching their own initiatives. Finally, systemic and rigorous efforts to develop and evaluate initiatives seeking to address aging stigma are essential to make the case that while aging stigma may be harmful to health, this relationship can be disrupted.

One final topic warranting consideration is the language we use. Currently, phrases such as "older adults" and "older people" are recommended for referring to this age category of people, as this terminology is perceived as being less likely to evoke negative stereotypes related to aging than other options.[88] The stigma literature also advocates for careful selection of word choices. However, they recommend a more nuanced approach. This consists of dispensing with language suggesting that a stigmatized category defines a person (eg, schizophrenic) and instead prioritizing the person

while also communicating a label if relevant (eg, person with schizophrenia). Perhaps, a future development in combating aging stigma and its harms will be to refer to "people of advanced age" or "adults with more years".

Limitations

First, although this review employed systematic methods, we may have missed some research providing insight on aging stigma and the health of US adults ≥65 years old, especially studies disseminated in languages other than English, books, and the grey literature. Second, while we were purposeful in limiting our review to studies conducted with samples comprised predominantly of US adults ages ≥65 to identify nationally- and culturally-specific patterns of aging stigma and health, we recognize that research conducted with a broader age range and geographic footprint provides important information on the phenomena of aging stigma and health more generally. The current study is intended to complement other systematic reviews on this topic conducted with more heterogeneous samples (eg, ages ≥40[22], ≥50[21], and ≥60[23], all of which included studies from across the globe). Third, consistent with a stigma framework, we only included articles if they had aging stigma variables that tapped into negative aging stereotypes. While aging stereotypes are predominantly negative and have become more negative in recent years,[4,89] some aging stereotypes may be considered positive or complimentary (eg, benevolent ageism). Yet, stereotypes of all kinds disregard older adults' individuality, reinforce narrow ideas of what older adults are supposed to be like, may be burdensome or patronizing, and are believed to be harmful to the health and wellbeing of the older adult population.[90–92] Finally, we did not formally evaluate the quality of studies included in the review due to the diversity of study types included. Instead, we elected to mine this body of literature for its collective insight with some attention to indicators of quality that readers may consider. For these same reasons, a meta-analysis was not appropriate.

Conclusion

Findings across the 29 included studies provided moderate evidence that aging stigma was associated with a wide variety of adverse health outcomes among US adults over 65. The inclusion of varied study types (ie, experimental, intervention, cross-sectional quantitative, longitudinal quantitative, and qualitative) facilitated synthesis of what empirical studies have revealed about mechanisms through which aging stigma may affect health, directionality of these relationships, and unanswered questions for future research. The review compiled evidence that can be used to make the case that aging stigma is a public health hazard. It can also inform the development of tailored intervention strategies in the US to promote health and wellbeing among those categorized, whether by themselves or others, as older adults.

Disclosure

The authors report no conflicts of interest in this work.

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