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Aging Anxiety as a Developmental Phenomenon: A Scoping Review and Multilevel Life-Course Model

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Abstract

As global populations age, aging anxiety (AA) has emerged as a significant psychosocial concern influencing how individuals anticipate, experience, and respond to later life. Despite growing scholarly attention, AA remains conceptually fragmented and insufficiently integrated across theoretical and developmental perspectives. This scoping review aims to systematically map and synthesize contemporary evidence on AA across the adult lifespan, integrate its psychological, physical, and structural determinants into a coherent explanatory framework, and critically examine interventions designed to mitigate its effects.

A systematic search was conducted across seven electronic databases (Scopus, Embase, CINAHL, Web of Science, ProQuest, MEDLINE, and PsycINFO) to identify peer-reviewed English-language studies published between 2014 and 2024 addressing AA and related constructs. Following title and abstract screening, full-text articles were assessed for eligibility. Data extraction was performed and cross-checked by multiple reviewers.

Across 108 studies, Findings indicate that AA is associated with a wide range of psychological, physical, social, and structural factors. Prominent risk factors included ageism, declining health, loneliness, psychological distress, chronic illness, and caregiving burden. Protective factors consistently identified across studies encompassed better physical and mental health, life satisfaction, social support, resilience, emotional intelligence, and regular physical activity. Importantly, several intervention approaches, particularly educational, reflective, and intergenerational programs, demonstrated promise in reducing AA.

This review reconceptualizes AA as a multidimensional, modifiable, and life-course phenomenon shaped by structural and psychosocial factors, offering critical insights to inform targeted interventions and policy initiatives that promote positive aging across the lifespan.

Public Significance Statement

This review reveals that aging anxiety develops and varies throughout adulthood. This research identifies psychological, physical, and social aspects that affect aging anxiety at different life stages, highlighting prospects for early, focused interventions and age-inclusive legislation. These findings affect mental health promotion, education, healthcare communication, and public policy to promote healthier aging in adulthood.

Introduction

Aging is a universal and irreversible process characterised by intertwined biological, psychological, and social dimensions(Sanchini et al., 2022), and it cannot be adequately understood through chronological age alone (Deshpande et al., 2024). Rather, it is shaped by a complex interplay of genetic predispositions, environmental exposures, lifestyle factors, and sociocultural contexts that collectively

influence how individuals experience and adapt to later life(Aliberti & Capunzo, 2025; Vereecke et al., 2025). This multidimensional nature of aging underscores the importance of examining not only objective indicators of decline but also subjective perceptions and emotional responses to the aging process.

Recent literature indicates that many older adults perceive themselves as aging successfully despite experiencing physical, cognitive, and psychosocial changes(Martin et al., 2015). Subjectively defined successful aging has been consistently associated with higher levels of psychological well-being (Susanti et al., 2020), greater life satisfaction (Bhattacharyya et al., 2025), and sustained engagement with life (Bowling & Iliffe, 2011). These positive self-perceptions support continued social participation, preservation of autonomy, and maintenance of meaningful social roles in later life (Zhu et al., 2025). In contrast, diminished well-being in older age has been linked to adverse psychological outcomes (Kang & Kim, 2022), including depression and anxiety (Cairney et al., 2008), which may precipitate more severe consequences such as malnutrition (Lobato et al., 2021), functional decline (De Beurs et al., 1999), institutionalisation(Dubois et al., 2008), and increased risk of suicide(Troya et al., 2019). Together, these divergent aging trajectories underscore the pivotal role of subjective aging experiences in shaping health, functional capacity, and quality of life across the lifespan. Within this framework, self-perceptions of aging have been conceptualised as encompassing two core dimensions, aging anxiety (AA) and future time perspective (Kim et al., 2018), positioning AA as a central psychological mechanism through which individuals anticipate and emotionally respond to the aging process.

Age related fear or AA refers to a specific form of anxiety associated with the aging process(Kavedžija, 2016). AA is a multifaceted construct that can be broadly conceptualised as feelings of fear and worry related to aging(Oh et al., 2020; Yawar et al., 2024). Individuals experiencing AA may express concern about the aging process as a whole (Candrian et al., 2022), or focus on particular domains, including physical functioning (Kılıçarslan & Yavuzer, 2021; Lee et al., 2024; Levinsky & Schiff, 2021; Penninx et al., 2000; Ramsey-Soroghaye et al., 2023), cognitive functioning (Foroughan et al., 2018lıçarslan & Yavuzer, 2021; MacKinlay & Burns, 2017; Starr et al., 1997), and social functioning (Candrian et al., 2022lıçarslan & Yavuzer, 2021; Mee Kim et al., 2020). Commonly reported concerns encompass fear of older adults, psychological distress, anxiety related to physical appearance, and fear of loss or dependency(Lasher & Faulkender, 1993). Although AA can reach levels that impair daily functioning(Palsgaard et al., 2022), it is not classified as a formal clinical diagnosis (Frazier et al., 2002; Mandy et al., 2025). Rather, AA is increasingly recognised as a transdiagnostic construct (Fetzner et al., 2016; McLaughlin & Nolen-Hoeksema, 2011), providing a useful framework for understanding age-related fears that may contribute to broader patterns of anxiety and maladaptive behaviours.

Empirical evidence has consistently linked AA to a range of adverse mental health outcomes (Adelirad et al., 2021) including depression(Bergman & Bodner, 2022; Lee et al., 2024; Mee Kim et al., 2020), dementia (Bowen et al., 2019; Kessler et al., 2014; Nguyen, 2024), and memory deterioration (Bowen et al., 2019). Beyond concerns related to health and functional decline, AA is closely associated with death anxiety (Husain, Malik, et al., 2024; Mee Kim et al., 2020; Poon & Li, 2024), and fear of dying(Bergman et

al., 2018). This includes worries about apathy(Mock & Segal, 2024), optimism(Hamama-Raz et al., 2023; Kuball & Jahn, 2024; Ramsey-Soroghaye et al., 2023), externalizing problems(Mock & Segal, 2024), meaning in life(Bodner et al., 2023), and fear of dependency(Kılıçarslan & Yavuzer, 2021; Ramsey-Soroghaye et al., 2023; Weber et al., 2021). From the perspective of terror management theory, unconscious fear of death is understood to drive human behaviour, leading individuals to symbolically project mortality onto others and to perceive older adults as outgroup members. (Boudjemadi & Gana, 2012; Greenberg et al., 1986). For younger adults in particular, aging may serve as a salient reminder of mortality, thereby reinforcing ageist attitudes and intensifying anxiety about one's own aging (Gherman et al., 2022).

Beyond the intrapersonal domain (Mock & Segal, 2024), AA is associated with reduced quality of life (Adelirad et al., 2021; Yawar et al., 2024), life satisfaction (Cooney et al., 2021; Lee et al., 2024), and self-efficacy (Cho, 2020). Environmental and structural factors, such as limited social support (Akeren & Akeren, 2024lıçarslan & Yavuzer, 2021; Mee Kim et al., 2020) inadequate access to healthcare(Tien & Huang, 2024), and economic insecurity(Candrian et al., 2022lıçarslan & Yavuzer, 2021; Kim et al., 2021), further exacerbate AA, with effects that are especially pronounced among older and socially vulnerable populations (Shao et al., 2021). Collectively, these findings indicate that AA is not merely an individual psychological phenomenon but is deeply embedded within interpersonal relationships and broader social and structural contexts.

Despite growing scholarly interest in AA, much of the existing literature remains scattered across various disciplines, populations, cultural contexts, and methodological approaches (Hofer & Piccinin, 2010; Teixeira da Silva et al., 2024). Studies often examine AA as an isolated psychological construct(Kuball & Jahn, 2024; Zhong et al., 2023), with limited efforts to integrate its conceptual foundations, measurement tools, associated demographic and cultural factors, interventions, and health outcomes. This fragmentation may be due in part to inconsistencies in how AA is defined and assessed across studies, as well as a lack of shared theoretical frameworks. Furthermore, the absence of a comprehensive synthesis hinders the development of informed, culturally sensitive strategies that promote adaptive responses to age-related fears and reduce reliance on maladaptive coping(Cosco, 2016; Wrosch et al., 2006). Given the increasing global significance of mental health in aging populations, and the need for a more unified understanding of AA, this scoping review was designed to address these gaps. Accordingly, this scoping review aims to systematically map and synthesise the existing evidence on AA by addressing the following research questions: (1) What are the key conceptual dimensions of AA? (2) How has AA been measured? (3) What demographic, cultural, and contextual factors are associated with AA? (4) What interventions have been developed to address AA? and (5) What outcomes and side effects have been reported across diverse populations and settings?

Methods

Search Strategy

This scoping review followed the methodological framework outlined by Arksey and O'Malley (2005) (Arksey & O'malley, 2005) and adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) (Tricco et al., 2018) guidelines. The protocol was registered in Open Science Framework (OSF) and can be accessed online (Remove reference for anonymity). An electronic search was carried out of Scopus, Embase (Elsevier), CINAHL (EBSCOhost), Web of Science, ProQuest, MEDLINE (Ovid), PsycINFO. Keywords were included from different data bases including medical subject Heading (MeSH), and related papers for AA. Appendix 1 describes the initial academic search method established for Ovid MEDLINE®, which was subsequently modified for use with additional databases.

Eligibility criteria

All sources that explored AA and related terminologies using qualitative, quantitative, or mixed-methods approaches were considered for inclusion in this scoping review. Studies were eligible if they met the following criteria: (1) research published in the last ten years (2014–2024) to capture the recent and most relevant literature, (2) examined the AA and related terminologies, and (3) peer-reviewed and written in English. Editorials, conference papers, dissertations/theses, and book chapters were excluded. Furthermore, studies that did not specifically address AA or include pertinent terminology were excluded, as they were beyond the review's purpose.

Study selection and data extraction

All publications identified were uploaded to Covidence. Two reviewers (BA, FM) independently screened titles and abstracts, resolving conflicts through discussion by third reviewer (TP). Full texts were assessed when abstracts lacked detail, and studies were categorized as relevant, irrelevant, or probably relevant. BA extracted the data, which FM and TP validated by cross-checking with original sources. The data extracted included (i) author/s and year; (ii) country; (iii) study design, (iv) the goal of the paper, (v) AA dimensions, (vi) participant information, such as the sample size and the age of study participants, (vii) assessment tools, (viii) interventions, and study findings relevant to AA. The extraction form was pilot tested with a few included studies to confirm that all relevant information would be captured. To maintain accuracy and completeness, the data extracted by one reviewer were independently verified by a second reviewer. Assessment of methodological quality of included studies was not conducted as it is not required in scoping reviews (Tricco et al., 2018).

Results

Search results

Initially, 1,291 documents were found through database searches. Upon eliminating duplicates, 720 records remained for analysis (see Fig. 1). The title and abstract screening method eliminated 586

records, resulting in 134 full-text papers for eligibility evaluation. Out of these, 26 articles were excluded for various reasons: not on AA (n = 14), not in English (n = 6), and other reasons (n = 6). In all, 108 papers satisfied the inclusion criteria and were incorporated into the review (see supplementary). Geographically, about one quarter of the studies were conducted in the USA (25/108; 23.1%), followed by 11.1% (12/108) from Israel. The other studies were widely distributed between five continents (Asia, Europe, Africa, Australia and both North and South America) (71/108; 65.7%).

Study Characteristics and Sample Size Distribution

Across the 108 included studies, the cumulative sample comprised 49,318 participants, plus one large-scale observational dataset analysing 760,140 online comments (Kim & Ryu, 2023), This dataset was considered separately because it did not involve individual-level participant sampling. Reported sample sizes varied widely, although most studies utilized small to moderate-sized samples (≤ 1,000 participants).

Sex/gender reporting revealed a systematic imbalance. Most studies included a higher proportion of female participants, with 80.6% reporting female-predominant samples. Eleven studies included women-only samples, often in the context of menopause, body image, or caregiving, whereas only three studies were male-exclusive. Several studies either did not disaggregate findings by sex/gender or reported sex/gender in non-comparable formats, limiting synthesis of gendered patterns.

Participant ages ranged from adolescence (≥ 14 years) to late adulthood (≥ 90 years); however, the literature was weighted toward young and middle-aged adults, particularly university students and working-age populations. Studies focusing primarily on older adults (≥ 60 years) were comparatively fewer, despite AA being conceptually linked to later-life transitions. This imbalance highlights a notable gap in the empirical literature.

Methodologically, the literature was dominated by cross-sectional survey designs, accounting for over 70% of studies, the majority of which were conducted in high-income Western countries, particularly the United States, Israel, and Western Europe, and published between 2014 and 2024. Smaller proportions employed experimental (7.4%), qualitative (5.6%), or mixed methods approaches, with these designs appearing more frequently in recent publications (post-2018). Longitudinal designs and intervention trials were relatively uncommon across all regions and publication years, limiting the ability of the existing literature to capture temporal change, causal mechanisms, and sustained intervention effects.

Thematic Mapping of Factors Examined in Relation to Aging Anxiety

The included studies were synthesised into three overarching thematic domains representing the types of factors most frequently examined in relation to AA: (1) psychological, (2) physical, and (3) sociocultural factors. These themes reflect the focus of measurement and analysis across studies, rather than causal pathways (see Fig. 2).

Theme 1: Psychological

Psychological factors refer to intrapersonal and emotional experiences that contribute to the development or intensification of AA. These include fears related to loss (Cooney et al., 2021), death(Lytle et al., 2020; Taşdemir, 2020), personal inadequacy(Bowen et al., 2019; Nguyen, 2024), and self-perception(Perales-Blum et al., 2014), as well as internalized ageism(Gendron, Marrs, et al., 2024) and relational anxiety toward older individuals (Gendron, Camp, et al., 2024; Gendron, Marrs, et al., 2024). Among the included studies, psychological worries were reported in 60.2% (*n* = 65), followed by fear of loss (55.6%, *n* = 60) and fear of older people (51.9%, *n* = 56), identifying them as core psychological triggers of AA.

Specific psychological components included death anxiety(Akeren & Akeren, 2024; Lytle et al., 2020), anticipatory fears of illness or incapacity (Barrett & Toothman, 2016), and existential concerns related to meaning, purpose(Matera et al., 2024; Taşdemir, 2020), and autonomy in later life(Ayalon, 2018; Bowen et al., 2019). In several studies, individuals expressed negative affect(Cooney et al., 2021; Hamama-Raz et al., 2023), low self-esteem(Mahoney, 2018), and emotional dysregulation(Mahoney, 2018; Mock & Segal, 2024), which compounded their distress related to the aging process(Cooney et al., 2021; Lee, 2021). Internalized negative stereotypes about aging(Ramírez et al., 2019) (Lytle et al., 2018), often developed through cultural and social messaging, further intensified feelings of fear, helplessness, or diminished self-worth. Overall, these psychological concerns reflect the deeply personal and subjective dimensions of AA, often operating independently of actual health status or social conditions, yet closely interacting with them to shape individual experiences of aging.

Theme 2: Physical Factors

Physical factors refer to concerns related to physical appearance, health, and functional ability, all of which contribute to the development or intensification of AA. Among the included studies, physical appearance was the most frequently reported physical concern (73.1%, *n = 79*), followed by issues related to general health (14.8%, *n = 16*) and physical disability or mobility limitations (14.0%). Specific aspects of physical anxiety included diminished physical competence and strength(Barrett & Toothman, 2018; Kiskac et al., 2024; Shimizu et al., 2023), reduced mobility and physical disability(Kessler et al., 2014; Shimizu et al., 2023), reproductive and menopausal concerns(Barrett & Toothman, 2018), and fears related to cognitive decline and dementia(Hamama-Raz et al., 2023; MacKinlay & Burns, 2017; Palsgaard et al., 2022). Notably, fear of visible signs of aging, such as changes in appearance(Barrett & Toothman, 2018), frailty(MacKinlay & Burns, 2017), loss of functional independence (Ayalon, 2018; Hamama-Raz et al., 2023) was frequently highlighted as a core source of anxiety. These physical changes not only affect daily living but also symbolize loss of control and vitality, reinforcing emotional distress associated with the aging process.

Theme 3: Sociocultural Factors

Social factors refer to interpersonal, cultural, and structural conditions that contribute to the emergence or intensification of AA. These concerns are linked to individuals' perceptions of their social value, relational roles, societal expectations, and the availability of external support systems. Among the included studies, key social contributors to AA included fear of social isolation (Akeren & Akeren, 2024; Zhong et al., 2023), financial insecurity(Bergman & Bodner, 2022; Zhang et al., 2020), and perceived stigma or devaluation in society (Husain, Malik, et al., 2024; Ramsey-Soroghaye et al., 2023).

Several studies also highlighted fear of becoming a burden, emotionally, physically, or financially, as a prominent source of anxiety (Kılıçarslan & Yavuzer, 2021; Kim & Ryu, 2023; Zhang et al., 2020). Reduced participation in social roles, caregiving stress (Hamama-Raz et al., 2023), and narrowing social networks (Candrian et al., 2022) were further identified as contributing factors, particularly among older adults facing retirement (Candrian et al., 2022), or transitions to institutional care (MacKinlay & Burns, 2017). Additionally, individuals expressed concerns about discrimination (Macdonald & Levy, 2016) (Candrian et al., 2022), negative age stereotypes (Cesnales et al., 2022; Taşdemir, 2020), and limited access to age-inclusive healthcare systems (Tien & Huang, 2024), which compounded feelings of vulnerability and exclusion (Nicol et al., 2021; Shao et al., 2021).

Overall, social factors illustrate how AA is embedded not only in personal or physical experiences but also in broader relational and societal contexts. The sense of diminished social belonging and declining external support was shown to amplify emotional distress related to the aging process across diverse populations.

Interventions

Across included studies, seventeen studies (17/108; 15.7%) employed interventions targeting AA. Interventions were predominantly educational (5/17; 29.4%), followed by simulations, and vignette-based designs (3/17; 17.6% each), intergenerational contact, psychotherapy, theory-driven strategies such as stereotype embodiment and self-affirmation. One study combined both education and intergenerational contact. Most interventions targeted young to middle-aged adults, though several included older participants in educational or intergenerational contexts. Program duration and intensity varied, ranging from brief experimental exposures to semester-long courses. Most were delivered in academic or community settings, with face-to-face formats being the most common, while a few incorporated digital or imagined contact components (see Table 1).

Interventions that integrated aging-focused education with meaningful or authentic interaction between younger and older adults produced the most consistent reductions in AA and improvements in attitudes toward aging. In contrast, simulation-based interventions, particularly those emphasizing physical or cognitive decline, yielded mixed or even adverse effects and, in some cases, heightened participants' anxiety. Vignette-based exposures similarly demonstrated variable outcomes, depending on framing and participant characteristics. Overall, interventions that emphasized emotional reflection or direct engagement with aging-related content, particularly educational and intergenerational approaches, were

most strongly associated with reduced AA and more positive perceptions of older adults(Bailey & Sudha, 2022; Boswell, 2015; Cesnales et al., 2022; Lytle et al., 2020; Sagel-cetiner & Harlak, 2022).

Table 1
Characteristics and Outcomes of Interventions Aimed at Reducing AA

Author/year	Interventions	Intervention outcome
(Caskie et al., 2024)	Vignette-Based intervention	Increased AA with cognitively intact older adults; more compassion toward older adults with Alzheimer's.
(Bashian & Caskie, 2023)	Vignette-based experimental design	Unhealthy older adults perceived more negatively, especially by those with higher AA.
(Shimizu et al., 2023)	Explanatory text based on Stereotype Embodiment Theory (SET)	Reduced AA, negative attitudes, and increased advocacy and motivation to avoid ageism.
(Sibley et al., 2023)	Aging Perception and Physical Activity Framing	Promoted physical activity but increased AA depending on message framing.
(Bailey & Sudha, 2022)	Gerontology-focused empathy-building intervention (EBI)	Reduced AA and increased interest in aging-related careers.
(Sagel-cetiner & Harlak, 2022)	-Developmental Psychology II (IDP) course -Aging Psychology (AP) course	Aging Psychology course significantly reduced AA and ageism more effectively.
(Caskie et al., 2022)	Vignette-Based Experimental Exposure to Older Adult Client Profiles	Negative clinical ratings amplified by AA and ageist attitudes.
(Cesnales et al., 2022)	Multigenerational classroom	Reduced AA, challenged stereotypes, increased appreciation for lifelong learning.
(Lytle et al., 2020)	Instapals (education about aging and intergenerational contact)	Reduced AA and ageism.
(Tsao et al., 2020)	Aging simulation experience	No significant effect on AA.
(Merz et al., 2018)	Interdisciplinary gerontology course	Did not reduce students' anxiety about aging.
(Armitage et al., 2017)	self-affirming exercise	Reduced fear-based AA compared to increasing anxiety in control group.
(Rittenour & Cohen, 2016)	Aging Self-Face Visualization Intervention	Increased AA in young adults.
(Boswell, 2015)	Aging Education with Service-Learning	Improved attitudes toward older adults; reduced AA; no effect on occupational interest.
(Perales-Blum et al., 2014)	Psychotherapy (Initial Crisis Intervention Model, Mentalization-Based Therapy (MBT)) and fluoxetine	Improved physical, emotional, and social outcomes; no anxiety about age-appropriate clothing or body image.

Author/year	Interventions	Intervention outcome
(Brinker et al., 2014)	The Game of Late Life	Reduced AA; improved attitudes with tutor-led discussion.
(Prior & Sargent-Cox, 2014)	Imagined Intergenerational Contact	Reduced AA in males; no effect in females.

Protective and Risk Factors Across the Lifespan

The studies reveal distinct age-related patterns in both protective and risk variables linked with AA, suggesting that susceptibility and resilience are dynamically influenced across the adult life course (see Fig. 3). Protective factors shifted from interpersonal and attitudinal resources in early adulthood to intrapersonal and existential resources in later life, whereas risk factors accumulated from identity and appearance concerns to health, dependency, and social-structural vulnerabilities.

Early adulthood (late teens to late 20s)

In early adulthood (mean age 18–29 years), protective factors were predominantly interpersonal, attitudinal, and future-oriented. High-quality and frequent intergenerational contact (Gherman et al., 2022; Jarrott & Savla, 2016), affinity to older adult(Gendron, Camp, et al., 2024; Gendron, Marrs, et al., 2024), optimism (Barnett & Adams, 2018), and knowledge about aging(Jarrott & Savla, 2016) were consistently associated with lower AA. Positive attitudes toward older adults (Drury et al., 2016), and perceived behavioral control(Parizian-Steinberg et al., 2024), further emerged as protective, alongside early indicators of social support(Akeren & Akeren, 2024) and subjective norms (Parizian-Steinberg et al., 2024). Conversely, risk factors in this age group were largely identity- and appearance-focused. Ageism(Davis & Graf, 2024) (Taşdemir, 2020) and negative age stereotypes(Taşdemir, 2020) appeared early and repeatedly, accompanied by body image concerns (including body surveillance, shame, and avoidance) (Gendron & Lydecker, 2016) (Kranz et al., 2023),, and low self-esteem(Mahoney, 2018). Existential risk factors,most notably death anxiety(Onuoha & Idemudia, 2019), were prominent, often co-occurring with worry, fear, and intrusive thoughts(Husain, Malik, et al., 2024). Disordered eating symptomatology, emotional dysregulation, interpersonal insecurity(Mahoney, 2018), loneliness(Akeren & Akeren, 2024), and intergroup anxiety further characterized vulnerability during this stage (Drury et al., 2016).

Early to mid-adulthood (30s)

Among individuals in their 30s, protective factors increasingly reflected internal psychological resources and social role integration. Emotional intelligence (Hwang & Kim, 2021), emotion regulation(Hwang & Kim, 2021), cognitive reactions to aging (Zhong et al., 2023), religiosity (Ramírez et al., 2019), well-being, life satisfaction(Faudzi et al., 2020), age identity, and job satisfaction or engagement (Macdonald & Levy, 2016)were frequently identified. Continued contact with older adults and sustained knowledge about aging remained protective(Hwang & Kim, 2021), but were complemented by broader indicators of psychological adjustment and social integration(Macdonald & Levy, 2016).

Risk factors during this period remained strongly tied to attitudinal and affective processes. Persistent ageism(Hwang & Kim, 2021), negative stereotypes toward older adults (Shimizu et al., 2023), prejudice (Abdollahi et al., 2021), gender inequality(Abbasi Shavazi et al., 2022), negative emotional reactions(Zhong et al., 2023), and emerging dementia-related worry(Kessler et al., 2014) were commonly reported. Psychological distress(Kessler et al., 2014) and fear of older people also appeared(Chonody et al., 2014), suggesting a shift from appearance-based vulnerability toward anticipatory concerns about future aging and social roles.

Midlife (40s)

In midlife (early to late 40s), protective factors were most strongly associated with health expectations, experiential knowledge, and perceived control. Positive expectations regarding physical, cognitive, and mental health, learning experiences, accurate understanding of aging (Palsgaard et al., 2022), communication with older adults, and knowing someone with dementia emerged as buffers against AA(Nguyen, 2024). Multidimensional quality-of-life indicators, including physical, psychological, social, and environmental domains, were consistently protective(Yawar et al., 2024), alongside life satisfaction, positive affect, and positive attitudes toward one's own aging(Cooney et al., 2021).

At the same time, risk factors became increasingly health- and role-related. Ageism remained prominent(Kikuchi et al., 2024) (Kolushev et al., 2021), while depressive symptoms, negative affect, death anxiety(Cooney et al., 2021), menopausal status(Kiskac et al., 2024), chronic conditions, financial strain(Barrett & Toothman, 2018), religious affiliation(Husain, Parveen, et al., 2024), and caregiving experiences(Nguyen, 2024) emerged as salient contributors to AA. These findings indicate that midlife represents a transition point where AA becomes closely linked to embodied health experiences and caregiving-related stressors.

Late midlife (50s)

In the 50s, protective factors increasingly reflected self-related evaluation, meaning, and adaptive aging orientations. Self-esteem, self-regulation(Lee, 2021), self-acceptance, personal growth, purpose in life (Matera et al., 2024), meaning in life(Bodner et al., 2023), positive age stereotypes(Lytle et al., 2018), and perceptions of successful aging and aging satisfaction(Shrira, 2016) were commonly associated with lower AA. Health appraisals(Lee, 2021) (Lytle et al., 2018), spousal support(Kim et al., 2018), interpersonal relationships(Lee, 2021), and positive parental health contexts also remained protective (Kim et al., 2021).

Risk factors during this stage were characterized by internalized and structural vulnerabilities. Ageism(Bodner, Shrira, Bergman, Cohen-Fridel, et al., 2015; Gendron, Marrs, et al., 2024; Poon & Li, 2024), discriminatory experiences (including on social media) (Sharma & Subramanyam, 2020), depressive symptoms(Bergman & Segel-Karpas, 2021; Carrard et al., 2021), loneliness(Bergman & Segel-Karpas, 2021), appearance-related concerns (Carrard et al., 2021), death anxiety(Bergman et al., 2018; Bodner, Shrira, Bergman, & Cohen-Fridel, 2015), disability (Bodner, Shrira, Bergman, Cohen-Fridel, et al., 2015; Shrira, 2016), secondary traumatization(Shrira, 2016), and heightened age awareness (Bodner et al.,

2023) were frequently reported. Financial strain, family illness(Kim et al., 2021), and Negative stereotypes(Ramírez & Palacios-Espinosa, 2016) (Lytle et al., 2018) further contributed to risk, highlighting the growing intersection between psychological vulnerability, and social context in late midlife.

Older adulthood (60+)

In older adulthood (60 years and above), protective factors were predominantly intrapersonal, existential, and autonomy related. Resilience(Hamama-Raz et al., 2023), self-control(Shao et al., 2021), ego integrity (Newton et al., 2022), autonomy(Shaw & Langman, 2017), continuity of self(Shaw & Langman, 2017), perceived controllability of cognitive decline(Bowen et al., 2019), positive physical activity attitudes(Monroe-Lord et al., 2023), self-rated health(Bergman & Bodner, 2022), psychological well-being(Newton et al., 2022), meaning in life(Bergman & Bodner, 2022), and perceived future social status(Kuball & Jahn, 2024) emerged as central buffers against AA. Reduced concern about healthcare access or affordability (Tien & Huang, 2024) also appeared protective in this age group.

In contrast, risk factors were largely health-, dependency-, and social-structural in nature. Chronic illness(Tien & Huang, 2024), functional limitations(Kılıçarslan & Yavuzer, 2021) (Shaw & Langman, 2017) (Newton et al., 2022), cognitive decline(Kılıçarslan & Yavuzer, 2021), caregiving burden(Candrian et al., 2022lıçarslan & Yavuzer, 2021), loneliness(Ayalon, 2018), social isolation(Candrian et al., 2022), economic insecurity(Candrian et al., 2022lıçarslan & Yavuzer, 2021), unmet healthcare needs(Tien & Huang, 2024) (Candrian et al., 2022), housing concerns, discrimination (including sexual-orientation-based discrimination) (Candrian et al., 2022), vulnerability to fraud(Shao et al., 2021), intolerance of uncertainty(Shao et al., 2021), and fear of being a burden(Hamama-Raz et al., 2023) were prominent. Emotional dysregulation, apathy, despair(Mock & Segal, 2024), dental and oral health, and perceived accelerated aging(Shacham et al., 2023) further characterized vulnerability in later life, underscoring the role of accumulated health and social losses.

Discussion

This scoping review synthesizes evidence on factors associated with AA across the lifespan, addressing a key gap in the aging and mental health literature. A major limitation of previous research on aging attitudes is its fragmented approach, often focusing solely on ageism or the experiences of older adults, without integrating the psychological, physical, social, and structural correlates of AA across diverse populations. This review shows that AA is a multidimensional phenomenon shaped by health status, psychological resources, interpersonal relationships, and broader sociocultural contexts, rather than being confined to later life. These results highlight the importance of a life-course approach for inquiry on AA and directions in research and intervention. Nevertheless, there is a preponderance of cross-sectional designs and overreliance on one or a few self-report measures in the current foundation of knowledge which contributes to difficult drawing causal inferences and constrains the field's capacity to conceptualize AA as an evolving process across life. It is recommended that there be more theoretical

integration and longitudinal studies to establish explanatory frameworks instead of simply descriptive relationships.

The first key insight relates to gender and age differences in AA. Gender differences were identified in those studies with replication samples, where generally women had more AA than men (Akeren & Akeren, 2024; Bodner, Shrira, Bergman, Cohen-Fridel, et al., 2015; Faudzi et al., 2020; Lytle et al., 2018; Monroe-Lord et al., 2023; Ramírez et al., 2019; Shrira, 2016). This trend may reflect both a heightened societal emphasis on women's physical appearance during aging and a broader tendency for women to report greater psychological distress (Brunton & Scott, 2015; Koukouli et al., 2014; Tomioka et al., 2019). Several studies also found that being male was associated with lower levels of AA (Sözvurmaz & Mandiracioğlu, 2017; Tomioka et al., 2019). However, this pattern appears to be domain-specific: for instance, men were more likely to report fear of older people (Ayalon, 2018; Brunton & Scott, 2015; Chonody et al., 2014), whereas women expressed lower fear in this dimension(Hošnjak & Goriup, 2024), suggesting that different facets of AA may manifest differently by gender. Although such trends have been relatively stable, gender most commonly is used as a binary demographic variable (male/female), and studies often recruit samples that are unbalanced in terms of gender. Therefore, psychosocial mechanisms of gender differences, e.g., internalized age norms, caregiving demands or different exposure to ageism, overall have not been addressed by now.

Age emerged as another important variable influencing AA. Although several studies found higher levels of AA among younger to middle-aged adults (Ayalon, 2018; Barrett & Toothman, 2016; Chonody et al., 2014; Hošnjak & Goriup, 2024; Palsgaard et al., 2022; Shao et al., 2021; Weber et al., 2021), likely driven by anticipatory concerns about future decline, others emphasised raised AA in older people (Asiret Guler Duru & Yusufoglu, 2021; Bowen et al., 2019; Faudzi et al., 2020; Gendron, Marrs, et al., 2024; Lee et al., 2020), which may be associated with loss experiences or the perception of suffering from illness or social invisibility. These results contradict the tendency of many to conceptualise AA as following a linear decay along the lifespan and highlight the necessity for taking a lifecycle perspective based on how different stages across age provide unique anxieties and meanings. Nevertheless, oversampling of young, student populations and under sampling of older adults and clinically vulnerable groups may affect estimates of age patterns. The limited longitudinal data base, in turn, constrains the ability to discriminate among developmental changes versus cohort or contextual effects.

Another important finding related to the impacts of the social and educational variables on AA. Greater education was associated with less AA throughout the selected studies (Ayalon, 2018; Barrett & Toothman, 2018; Bodner, Shrira, Bergman, Cohen-Fridel, et al., 2015; Bowen et al., 2019; Hošnjak & Goriup, 2024; Shrira, 2016), potentially owing to stronger health literacy and availability of information rather than higher use of non-adaptive coping styles. Similarly, people with high income felt less fear about growing old (Abdollahi et al., 2021; Akeren & Akeren, 2024; Bergman & Bodner, 2022; Bodner et al., 2023; Lee et al., 2024; Tien & Huang, 2024), which indicates that economic security can be a protective factor to the perceived fears towards increasing dependency and lack of access to health care as well as loss of control. These patterns elucidate the importance of structural conditions in the construction

of aging and indicate social and economic inequality to be an under-theorised yet significant determinant of AA. However, economic and structural drivers are typically subordinated as background covariates rather than central drivers in socioecological frameworks. Consequently, some of the interlocking impacts of economic insecurity, access to healthcare and institutional ageism are under-theorised and lack empirical validation.

Intervention-focused studies also yielded important insights. Psychotherapeutic approaches were shown to improve both emotional well-being and social functioning in individuals experiencing AA. Educational and intergenerational interventions similarly demonstrated effectiveness in reducing both AA and ageist attitudes (Bailey & Sudha, 2022; Boswell, 2015; Cesnales et al., 2022; Lytle et al., 2020; Sagel-cetiner & Harlak, 2022). However, studies utilizing simulated aging or vignette-based exposures presented mixed results. While such methods aimed to build empathy, they occasionally heightened anxiety or reinforced negative stereotypes, particularly when focusing heavily on physical or cognitive decline (Bashian & Caskie, 2023; Caskie et al., 2024; Caskie et al., 2022; Rittenour & Cohen, 2016; Tsao et al., 2020). These findings indicate that interventions that do not consider the context of aging in the promotion of decline and/or disrupt these types of narratives might be adding to threat-based perceptions of aging. Conversely, the interactive-reflective-dialogic genre was more consistently effective in developing nuanced understanding and emotional engagement (Brinker et al., 2014). Last, stereotype-targeted education and self-affirmation about how to decrease aging-related fears and maintain more positive attitudes towards older adults were found (Armitage et al., 2017; Shimizu et al., 2023). However, while these results are promising, the intervention literature is still characterized by small sample sizes, short follow-up periods and the concentration on educational environments and younger age-groups. Limited to a lack of enduring, theory-based interventions at a clinical/community/policy-related level on which long-term effectiveness and scalability beliefs could have been built.

In addition to identifying the age-graded patterns of risk and protective factors, the literature reviewed highlights a more fundamental conceptual gap within theorizing with regard to AA over the life course. Whereas the majority of studies implicitly consider age as a static category variable, rather than a real developmental process, little is known about how transition to life stages (e.g., transition into midlife, retirement or health decline) influences changes in existential AA. As a result, it remains unclear whether observed shifts in AA reflect normative developmental adaptation, accumulation of stressors, or context-specific disruptions linked to historical, cultural, or institutional conditions. Moreover, although protective and risk factors have been disputable in the literature, there is limited understanding of their potential interactions over time (e.g., does early life intergenerational contact mitigate health-related anxiety in later life; does midlife caregiving accelerate vulnerability in a lack of existential or autonomy mechanisms). The lack of temporal integration results in a fragmented representation of AA, viewing it as an accumulation of correlates instead of a dynamic phenomenon within an individual's life history.

Future research should formally conceptualize and model AA as a life-course phenomenon influenced by the timing, sequencing, and accumulation of exposures, employing longitudinal or cohort-sensitive

designs to differentiate developmental changes from contextual and generational influences. These deficiencies are required to be addressed to enhance the concepts and to identify age-sensitive leverage points when prevention and intervention might have the most significant benefit.

Based on the integrated evidence, this review proposes a comprehensive yet parsimonious multilevel life-course framework of AA, visually represented as layered, age-progressive domains that illustrate the cumulative, overlapping, and interacting influences shaping AA across the lifespan (see Fig. 4). In this model, AA is conceptualized as a latent construct, and is influenced by domains of social interaction, psychological factors, and physical health which are nested within larger socio-demographic and environmental influences. The hierarchical nature of the model illustrates the interaction between distal influences (e.g., socioeconomic status, cultural scripts and age-based norms), which influence proximal factors (i.e. health status, affect regulation, interpersonal relationships), that in turn may or may not serve to compound or dilute AA over the life course. The highest likelihood of adverse outcomes occurs when risk accumulates across levels; protective factors and targeted interventions may potentially operate on different system levels to reduce vulnerability. Critically, this framework is centered on an empirically guided approach that synthesizes observed patterns across the studies reviewed and identifies key limitations in the literature, such as low frequency of longitudinal evidence, inadequate exploration of mediating mechanisms, and lack of consideration of structural factors that influence aging-related psychological well-being. Hence, the model offers an evidence-based integrative framework for guiding empirical studies, intervention development and implementation, and policy efforts that may address AA or promote adaptive pathways of aging.

Implications

The findings of this review have substantial implications for the research, practice and policy. The current findings suggest the need for future longitudinal and theory-based investigations to determine causal pathways for AA, as well as how it may develop and unfold across different types of populations and cultural backgrounds over time. At the practice level, interventions should go beyond individual-level strategies to focus on the development of psychological resilience, intergenerational connection and the creation of age-inclusive social context. On the policy level, it is important to address structural determinants, encompassing factors such as access to healthcare, economic security, and discriminatory ageist norms, that would contribute to lowering AA among populations. Together, these implications highlight the importance of multi-level, systems-oriented approaches to age anxiety prevention and for promoting adaptive aging paths across the life course.

Conclusion

This scoping review highlights AA is a nuanced and multi-dimensional construct that changes over the life span, and is influenced by complex interactions between physical health, psychological resources; social relations; and broader socio-cultural and structural contexts. This evidence highlights that age anxiety is not restricted to later life but arises earlier and is shaped by subjective and objective

experiences of growing old. Health (positive health perceptions), psychological wellbeing, meaningful social participation and supporting intergenerational relationships were universally faith-increasing protective factors, while functional decline, psychological distress, ageism, social isolation and structural inequities exacerbated those fears. These combined results highlight the importance of a unified, life-course, focused perspective on AA.

Declarations

Author Contribution

Author contributionsBahareh Ahmadinejad: Conceptualisation, study development, investigation, formal analysis and writing of the manuscript. Timothy Piatkowski: Conceptualisation, writing, review, editing and supervising. Fateme Mirzaee: Conceptualisation, formal analysis, investigation. Sohil khan: writing, review, editing and supervising. Amada J Wheeler: writing, review, editing and supervising.

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Bahareh Ahmadinejad: Conceptualisation, study development, investigation, formal analysis and writing of the manuscript. **Timothy Piatkowski:** Conceptualisation, writing, review, editing and supervising. **Fateme Mirzaee:** Conceptualisation, formal analysis, investigation. **Sohil khan:** writing, review, editing and supervising. **Amada J Wheeler:** writing, review, editing and supervising.

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Figures

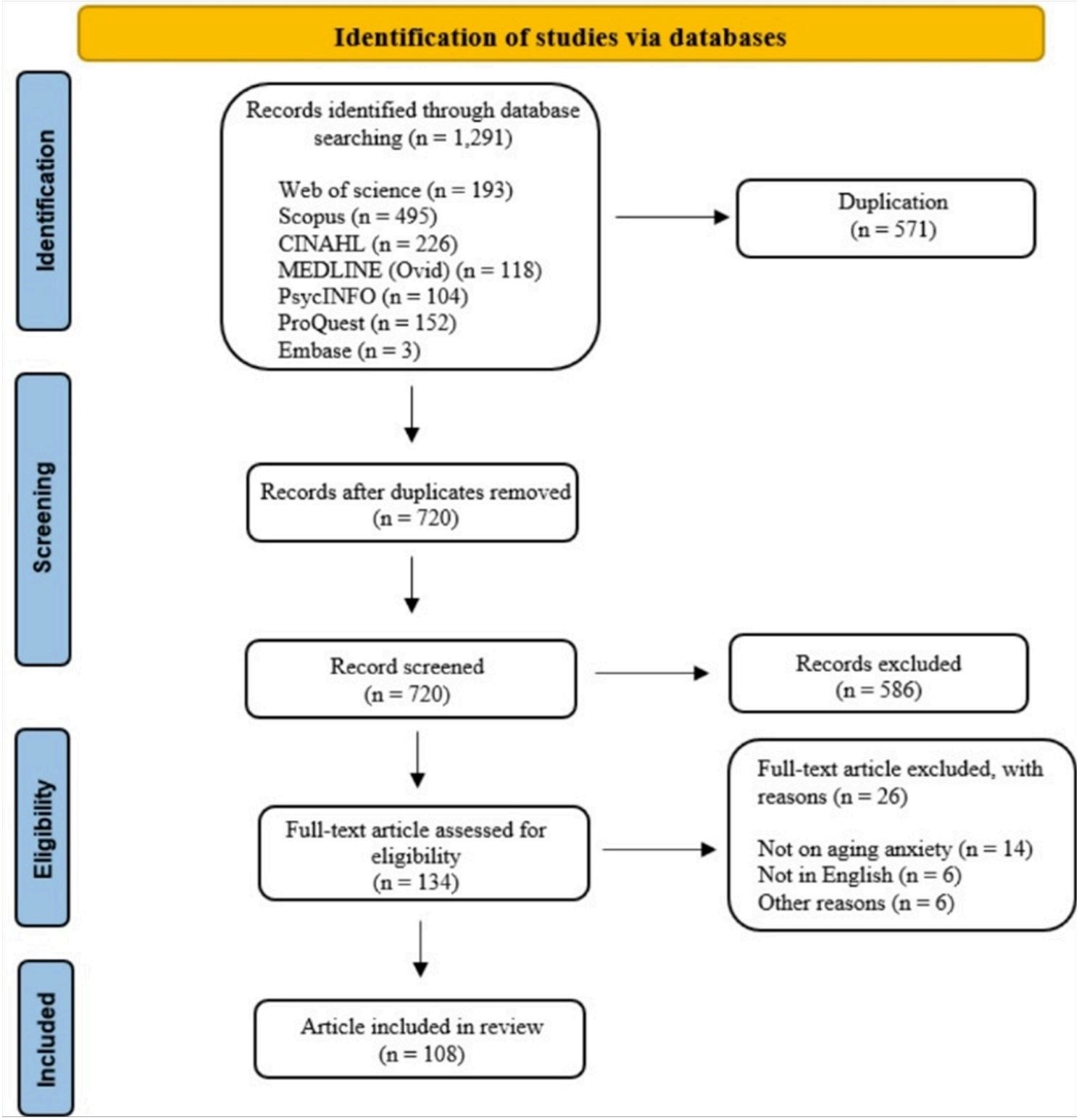


Figure 1

Study selection process for AA

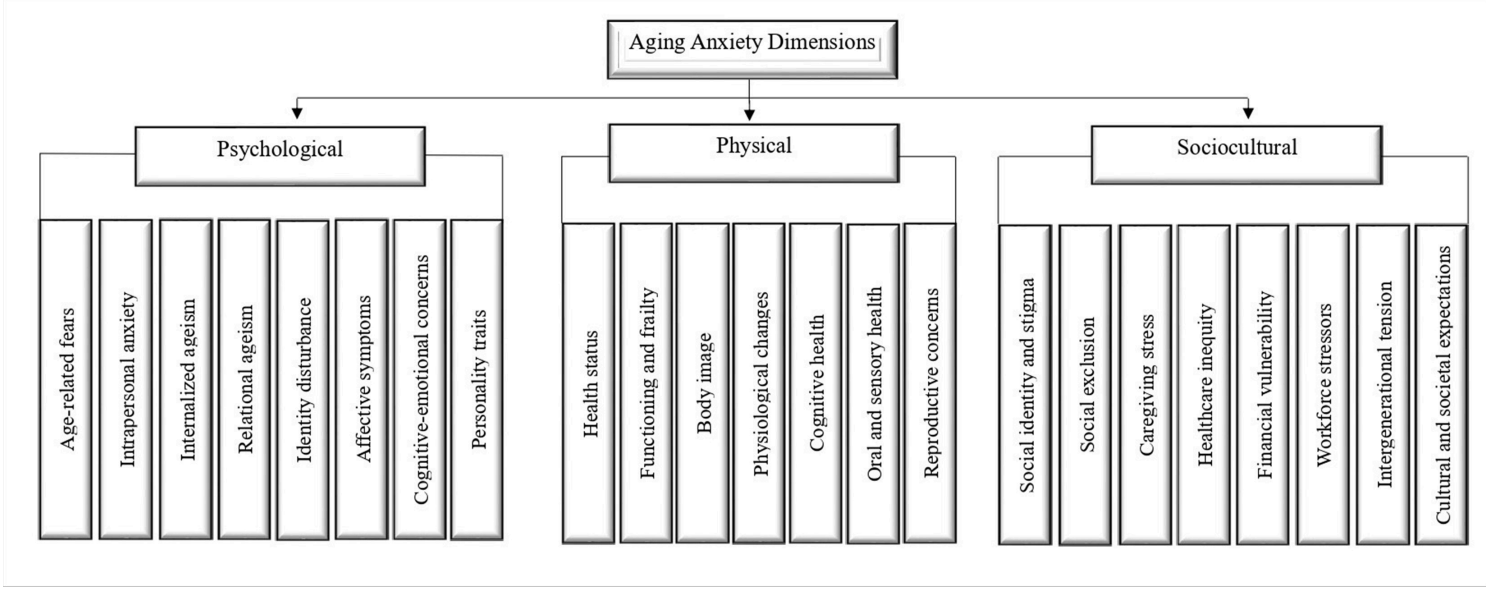


Figure 2

AA Dimensions

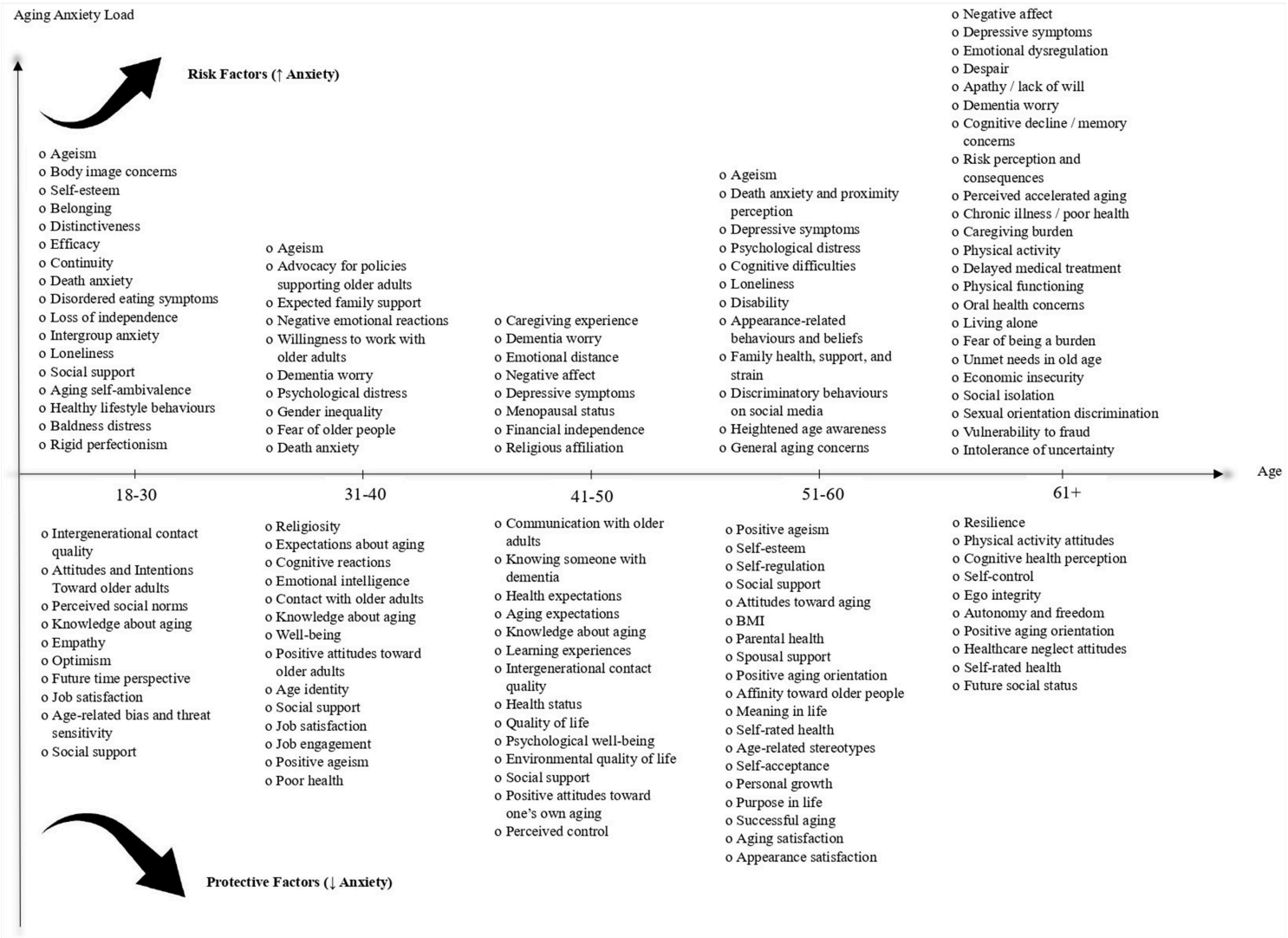


Figure 3

Age-Related Distribution of Risk and Protective Factors Influencing AA

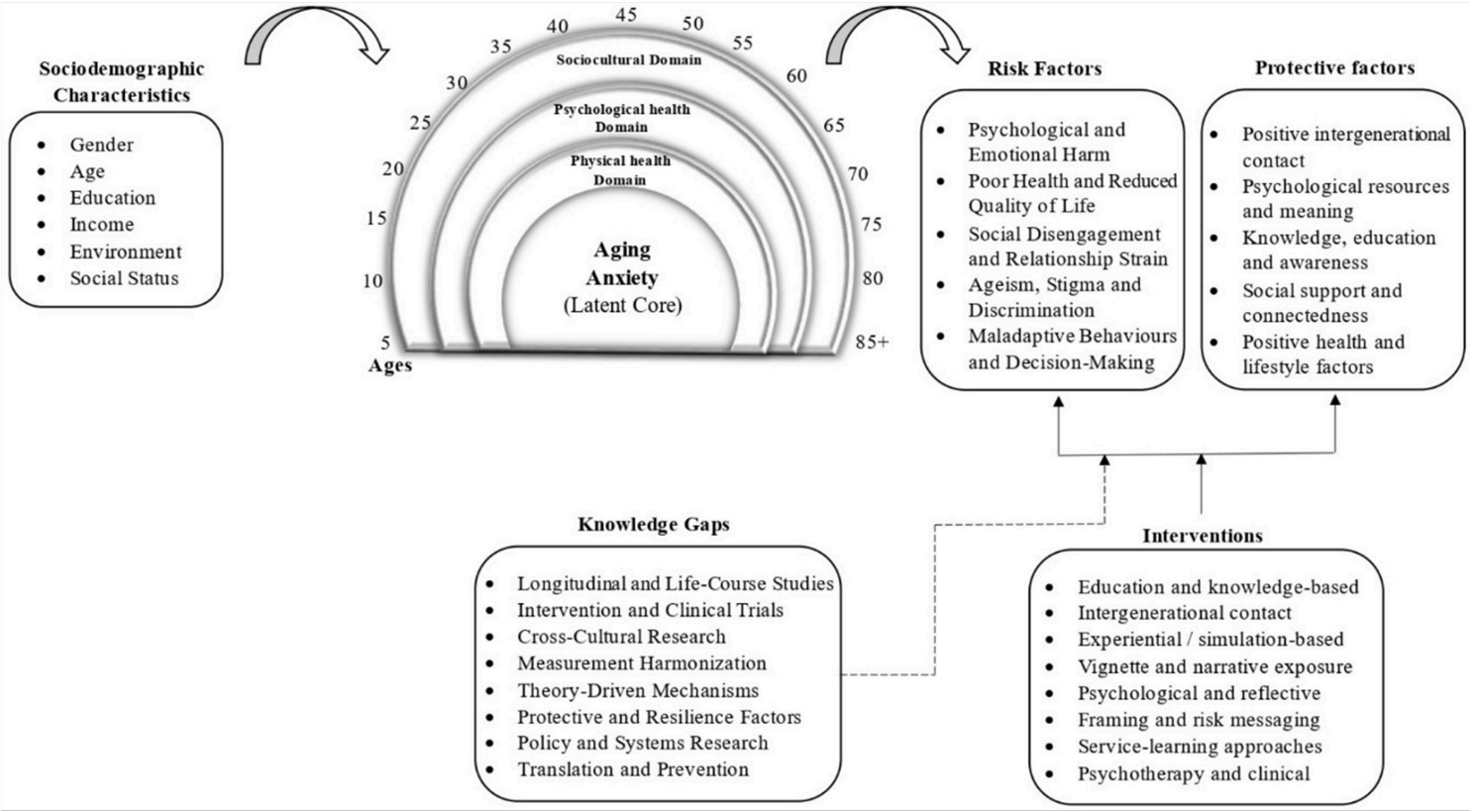


Figure 4

A Developmental Framework of AA Across the Lifespan

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