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Associations between retirement, social security policies and the health of older people: a systematic review

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Abstract

Background As people age, they are more likely to experience several health conditions which are circumstances that arise throughout life that can interfere with an individual's ability to work, leading them to demand the social security system. This research aims to systematically review and synthesize studies related to health conditions in the aging process with social security policy reforms.

Methods A systematic review was performed across Embase, Web of Science, Scopus, Pubmed, CINAHL, ASSIA (Proquest) and APA PsycNet from 1979 to 2022. Methods are outlined in a published protocol registered a priori on PROSPERO (CRD42021225820). Eligible studies include original empirical articles published in English, Spanish, French and Portuguese, using the search terms "aging" and "social security". Identified outcomes were organized into categories and a meta-ethnography was completed following the phases proposed by Noblit and Hare and the eMERGe meta-ethnography reporting guidance.

Results There were 17 eligible studies from 4 continents with 10 cross-sectional, 1 both cross-sectional and longitudinal and 5 longitudinal data analysis. These assessed the relationship of health conditions that occur in the aging process related to social security policies, in particular, to retirement. The categories included (i) health as a way to promote an active working life for the elderly; (ii) health as an indicator for reforms in social security policies; (iii) retirement planning as a strategic element for coping with post-retirement life; and (iv) the relationship between social security policies and psychological health.

Conclusions This review showed that health and retirement defined in social security policies are related and have an impact on people's lives, especially in the decision to leave the labor market. Therefore, measures to assess the possible consequences of this relationship when promoting reforms on social security policies should be encouraged.

Keywords Health, Aging, Social security, Public policies

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Background

Population aging is poised to become one of the most significant social transformations of the 21st century, with implications for every sector of society, including the labor and financial markets, the demand for goods and services such as housing, transportation, social protection, family structures and intergenerational ties [1]. It is estimated that by 2050, there will be 1.5 billion people aged 65 and older worldwide, more than doubling the number of individuals in this age group in the year 2020 [2]. The percentage of older people in the global population is expected to increase from 9.3% in 2020 to 16.0% in 2050, indicating that by the middle of the 21st century, one in six people worldwide will be 65 years of age or older [2].

The World Health Organization [3] conceptualizes elderly people based on age criteria for research purposes. Based on this criterion, an elderly person is one who is aged 60 or over who lives in developing countries, and one who is aged 65 or over who lives in developed countries. Additionally, it is recognized that aging is a continuous, multidimensional and multidirectional process of changes dictated by the concurrent action of the genetic-biological and socio-cultural determinants of the life cycle [4, 5].

As people age, they experience a gradual decrease in physical and mental capacity, and a growing risk of disease and death which, at a biological level, results from the accumulation of molecular and cellular damage over the course of the lifetime [6]. These health conditions can be defined as the circumstances in the health of individuals that require responses from health systems professionals and users [7]. It can generate a disabling process and significantly compromise the quality of life of the elderly.

Beyond biological changes, the current context is geared towards producing a more favorable social and cultural environment for healthy aging and it is the role of public policies to help more people reach old age in the best possible state of health [8]. In order to reach that, aging is often associated with other life transitions, such as retirement. The aspects that determine retirement are interconnected to the individual's life story, permeated by the combination of identity, family, friendship, work relationships, and professional career [9–12]. Nevertheless, to achieve this, it is necessary to be part of a social security system responsible for managing the granting and payment of pensions.

In all sorts of retirement, the economic situation of the state and the availability of similar social/welfare benefits can influence its meaning and consequences, since retirement must be thought about and sought after from a young age [13]. Several types of Welfare State regimes represent different responsibilities assumed by

the market, the state and the family in the management of social risks and social security [14]. Previous research shows that countries with the most comprehensive Welfare State, such as Denmark, Sweden, and Norway, have better population health outcomes when compared to Neoliberal States such as the United States and the United Kingdom [15, 16].

The discussion about social security policies can be located between the fields of health of the elderly and workers' health, considering that the experience of this period does not occur in isolation, but is interconnected, among other factors, to their professional trajectory and to the different stages that make up the life cycle. Researchers have continued to show a strong link between older workers, health, planned retirement age [17–19], current retirement behaviors [20–22], and adjustment and satisfaction with post-retirement life [23–26]. In this paper, we aimed to capture current evidence in a systematic review to understand how health conditions in the aging process are related to social security reforms.

Methods

Search strategy and selection criteria

The search procedures for the studies took place between September 2021 and March 2022, with the last search being carried out on March 3, 2022. This systematic review aligns with the PRISMA checklist [27, 28] and methods are outlined in detail in a protocol registered a priori on PROSPERO (CRD42021225820). Likewise, a protocol article was published in a peer-reviewed journal [29].

Eligibility was based on the Population, Intervention, Comparison, Outcomes (PICO) framework, with studies included if they met the following criteria: (1) participants who are in the process of transition to retirement or retired; (2) examined retirement guarantees as intervention/exposure which could be pension benefits, health insurance, subsidized assistance and other contributory schemes; (3) outcomes measured by quantitative methods that analyze the association or influence of social security policies on any outcome related to mental or physical health, such as psychological symptoms, mental disorders, illnesses, well-being. (4) original empirical studies published in English, Spanish, French and/or Portuguese, as these were the most common languages in the research, between 1979 and 2022 that examined aging from health conditions related to social security policies. Studies that identified any results associated with mental health and/or physical health, such as psychological symptoms, mental disorders, illnesses, well-being were included. The choice of 1979 to begin the search is due to the change in policies adopted by countries from a Welfare State to a neoliberal structure, marked by the

Table 1 Search criteria for electronic databases

Key-words	Number	Search criteria
Social Security	1.	Social Security*Health
	2.	MeSH/EMTREE descriptor Social Security (this term only)
	3.	#1 OR #2
Aging	4.	Aging*
	5.	MeSH/EMTREE descriptor Aging (this term only)
	6.	#4 OR #5
	7.	#3 AND #6

election of Margaret Thatcher in the United Kingdom in May 1979.

Searches using the indexed terms “social security” AND “aging” were conducted across Embase, Web of Science, Scopus, Pubmed, CINAHL, ASSIA (Proquest) and APA PsycNet. Table 1 presents the full search criteria. Two independent reviewers (LT, FU) screened titles and abstracts for eligibility and studies that met criteria on title and abstract, underwent full text review. Using an excel spreadsheet, data from all studies were then independently extracted by the two reviewers (LT, FU), characteristics of the study (year of publication, study location, author); study design (longitudinal study, cross-sectional, case-control, other); sample size; participant characteristics (age, sex, years of education, marital

status); method of data collection; method of analysis; instruments (health conditions measurements and retirement measurements) and the main conclusions of the study.

The PRISMA flowchart in Fig. 1 shows that 8,758 records were found in the databases. 1,336 duplicates were removed by automation tool, leaving 7,422 articles for title and abstract screening. Of these, 72 articles underwent full-text assessment and 17 met eligibility criteria and were included.

Data analysis

Risk of bias and study quality

Risk of bias and study quality was assessed at study-level using the Newcastle-Ottawa Scale (NOS) for cross-sectional and observational studies [30]. The NOS scale employs a star system by means of a checklist consisting of three criteria: (a) Selection: where the representativeness of the participants is assessed by analyzing the sampling and sample formation processes; (b) Comparability: where the confounding factors adjusted for sample analysis are identified; and (c) Result: where the evaluation and analysis of the results are verified. According to the scoring system, studies are scored in a range from 0 to 10 points and classified as low (10 and 9 points), medium (7 and 8 points), or high (<7 points) risk of bias. Higher scores represent better quality. Overall, the NOS scale

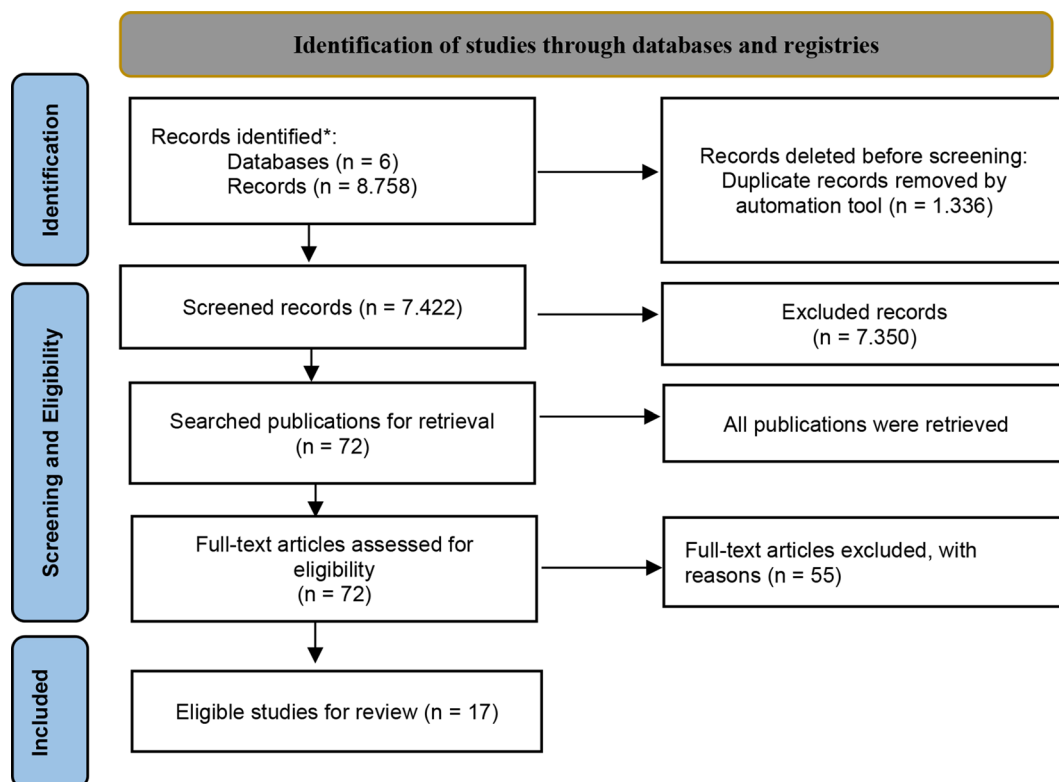


Fig. 1 PRISMA Flowchart

demonstrates good inter-rater and test-retest reliability [31, 32].

Meta-ethnography

A narrative synthesis was performed using the meta-ethnography [33], which helps synthesizing the studies by combining the results found in an interpretive and non-aggregative way, to generate a higher level of analysis that produces a more relevant contribution than the individual findings of each investigation. Categories were created through thematic analysis of the data considering the evidence found in the selected studies.

Initial synthesis involved extraction of each paper findings, key concepts, metaphors and themes to determine how the studies are related to one another, and to develop descriptive codes. The key themes and relationships from the selected studies were tabulated. A translational process was then undertaken to synthesize the findings using reciprocal analysis to create themes. The final findings were reported in a clear and concise manner to provide readers with a clear understanding of how we arrived at our findings. All stages were undertaken collaboratively by the research team. Data synthesis were independently undertaken by two reviewers (LT, FU); with a third author (JP) used for consensus as appropriate. The eMERGe meta-ethnography reporting guidance was followed [34].

Role of the funding source

The funders had no role in study design, data collection, analysis, interpretation, or writing. The corresponding author had full access to all data and final responsibility for the decision to submit for publication.

Results

Seventeen cohorts of adults and elderly people were analyzed from the following countries: Australia, Austria, Belgium, Canada, China, Czech Republic, Denmark, Estonia, France, Germany, Greece, Hungary, India, Ireland, Italy, Japan, Netherlands, Philippines, Poland, Portugal, Slovenia, South Korea, Spain, Sweden, Switzerland, United Kingdom, and United States. The sample range varied between 80 and 18,345 individuals with an age range of 30 to 87 years. Of the 17 studies, 10 reported cross-sectional data analysis, 1 reported cross-sectional and longitudinal analysis and 5 analyzed longitudinal data. The main characteristics and results of the studies are presented in Table 2.

A predominance of studies was carried out in the European continent (73.58%), with the largest number of studies concentrated in Sweden. In the Americas, in turn were 13.20% of the studies concentrated in the United States and Canada, followed by 11.32% in Asia and 1.88% in Oceania. However, there is a lack

of research in African regions and in Latin and South American countries. Identified studies evaluated the relationship between health conditions that are more common in older adults, retirement and social security policy reforms - particularly those related to retirement - and were published between 1995 and 2021. Individual study risk of bias assessment is presented in Table 3.

Health as a way to promote an active working life for the elderly

The perception that individuals have about their health condition and their permanence in the labor market is related. Four studies brought results suggesting this relationship [35–38]. In all studies, a good perception of health in general scope was found to be a determining factor for remaining in the labor market. Although retirement is an expected event, many older people would consider staying in the labor market for longer if there were better working conditions, such as additional senior citizen days, longer vacations, flexible work hours, and if the work was less physically demanding [38]. Also, unionized workers reported that favoring of prolonging work is not out of sheer necessity, but rather, because the expression of this desire comes from work attachment and professional identification [35]. Retirees who were in excellent health retired from their career jobs, were more likely to take bridge jobs, that bridge the gap between full-time employment and complete withdrawal from the labor force [36]. Workers who reported fair or poor physical health were less likely to remain employed after the ages of 62 and 65, moreover, there was a gradual decline in self-reported health and worsen health conditions over time [37]. According to the data found, a good self-reported health status is a factor that promotes the extension of elderly individuals in the labor market, despite meeting the legal eligibility criteria for retirement.

Health as an indicator for reforms in social security policies

Health conditions were associated with changes in countries' laws about the eligibility criteria for receiving social security benefits. Four studies explored how health conditions could work as indicators for social security policy reforms [39–42]. The studies considered the following health conditions: subjective well-being, life satisfaction, and health status and related them to changes in social security of the countries subject to their analysis.

An increase in pension insecurity is associated with a reduction in life satisfaction, and it is a negative and significant relationship. The individuals most affected by pension insecurity are those who are further away from their retirement, have lower incomes, rate their life expectancy as low, have higher cognitive abilities, and do not expect private pension payments. However, while younger cohorts have more time to adapt to new pension

Table 2 Characteristics of the studies

Author (first), year, country	Design	Sample	Health Condition Measure/ Instrument	Social Security Measure/ Instrument	Outcomes	Risk of Bias
Schofield et al., [48], Australia.	Cross-sectional	8,864 workers. Age between 45 and 64 years. Weighted average for country population in this age group. 25,236 out of the labor market for depression; and 39,159 for another mental disorder. Sex/Depression: M = 12,530; F = 12,706; Sex/Mental Disorder: =25,789; F = 13,370.	Depression and Mental Disorder/Measured by self-assessment. Health Status/Measured by the Australian Bureau of Statistics classification using ICD-10.	Early retirement/Defined by being out of the labor market due to illness.	On average, those who are not in the labor force because of depression and other mental disorders have 78% (95% CI 92.17–37.09) and 93% (95% CI 98.44–70.45), respectively, less wealth than those who are employed full-time with no health condition. Being absent from the labor force due to depression and other mental disorders results in 43% and 37% less income, respectively, than being in the full-time labor force.	Av-er-age
Mulders et al., [42], Netherlands.	Cross-sectional	1,351 workers. Age ranged from 40 to 66 years (M = 52.68; SD = 7.21). Sex: M = 50.85%; F = 49.14%. Education: Low = 18.46%; Average = 41.15%; High = 40.49%. Marital Status: Single = 21.75%; Married = 62.69%; Divorced = 13.92%; Widowed = 1.63%.	Emotional Responses/Measured by items: When you think about working until your statutory retirement age. "Are you worried about being physically able to do so?"; "Are you worried about being mentally able to do so?"; "Are you angry?". Cognitive Responses/Measured by items: "Do you think about taking a different job for the last phase of your career?"; "Do you think about how you can keep meeting the requirements for your current job?"; e "Do you think about how to keep your work pleasurable?"; Behavioral Responses/Measured by item: "Do you keep up to date with new developments in your current work?"; Do you maintain a healthy work-life balance?"; and "Do you pay more attention to healthy living and working?"	Retirement/Defined by legal concept – age.	Workers in firms that aim for longer working hours and the social environment is more conducive to continued work show more adaptive responses. Workers who have no experience with age discrimination adjust better to increasing retirement age. Workers where HR facilities are more accessible are less likely to have negative emotional and cognitive responses, but more likely to adjust their behavior to facilitate later retirement. Workers with low levels of education have less ability to adjust to extended employment. Workers in poor health have more difficulty adjusting to an increase in retirement age.	Av-er-age

Table 2 (continued)

Author (first), year, country	Design	Sample	Health Condition Measure/ Instrument	Social Security Measure/ Instrument	Outcomes	Risk of Bias
Andersen et al., [38], Denmark.	Cross-sectional	11,444 employees. Age: 50 years and older. Split into two groups: (a) Mainly seated at work: Sex: M = 3498; F = 3899; Age: M=(M=56.9); F=(M=56.2) (b) Mainly physical work: Sex: M = 2600; F = 1447. Age: M=(M=56.9); F=(M=56.2).	Smoking, height, weight, BMI, physical activity - leisure, physical activity - work, leisure, health, and well-being/Measured by the questionnaire regarding factors conditioning retirement intentions which contained 15 multiple-choice response options.	Retirement/ Defined by legal concept - age.	For the "mainly seated at work" group, the main expected reasons for retirement were freedom of choice and the desire for more leisure time (OR 0.44–0.48), but many would consider staying longer if there were better possibilities for additional senior citizen days, longer vacations, and flexible work hours. For those in physical work, poor physical health (OR 2.06) and not being able to do the work (OR 1.68) were common reasons for retirement, but many would consider staying longer if the physical work was less demanding and if there were more senior citizen days.	Low
De los Santos et al., [45], Philippines.	Cross-sectional	80 employees in pre-retirement. Age range 58–65 years. Sex: M =46.3%; F = 53.8%. Marital Status: Single = 11.3%; Married = 77.5%; Widowed = 6.3%; Divorced = 3.8%. Education = High school grad = 12.7%; College level = 20.3%; College graduated = 20.3%; Masters unit = 12.7%; Master's degree holder = 6.3%; Doctoral units = 7.6%; Doctoral degree = 20.3%.	Happiness/HM also known as the Fordyce Emotion Questionnaire.	Employee Readiness for Retirement/Measured by researcher-designed RRS.	Happiness in their financial situation ($\beta = 0.888, p = 0.008$), employee gender [(being female) $\beta = 1.992, p = 0.041$], marital status [(being married) $\beta = 5.869, p = 0.011$], and education [master's degree, ($\beta = 4.841, p = 0.027$) and doctoral degree ($\beta = 3.248, p = 0.044$)] strongly predict being ready for retirement.	Low

Table 2 (continued)

Author (first), year, country	Design	Sample	Health Condition Measure/ Instrument	Social Security Measure/ Instrument	Outcomes	Risk of Bias
Horner, [39], Austria, Germany, Sweden, Netherlands, Spain, Italy, France, Denmark, Greece, Switzerland, Belgium, Czech Republic, Poland, Ireland, the United Kingdom, and the United States.	Cross-sectional	18,345 subjects. Age between 50 and 70 years (M = 60.4). Marital Status: Married = 81.3%. By country: Austria (n = 373; Age: M = 61.9; Marital status: Married = 83.4); Germany (n = 854; Age: M = 61.2; Marital status: Married = 88.3); Sweden (n = 821; Age: M = 61.3; Marital status: Married = 86.1); Netherlands (n = 869; Age: M = 59.9; Marital status: Married = 87.9); Spain (n = 612; Age: M = 60.2; Marital Status: Married = 84.8); Italy (n = 897; Age: M = 61.3; Marital Status: Married = 90.5); France (n = 878; Age: M = 59.3; Marital Status: Married = 86.0); Denmark (n = 858; Age: M = 59.5; Marital Status: Married = 84.4) Greece (n = 972; Age: M = 60.0; Marital Status: Married = 87.8); Switzerland (n = 451; Age: M = 59.9; Marital Status: Married = 82.7); Belgium (n = 984; Age: M = 59.6; Marital Status: Married = 85.6); Czech Republic (n = 870; Age: M = 59.5; Marital Status: Married = 85.9); Poland (n = 765; Age: M = 59.4; Marital Status: Married = 84.4); Ireland (n = 367; Age: M = 59.7; Marital Status: Married = 79.6); United Kingdom (n = 2,767; Age: M = 60.6; Marital Status: Married = 70.5); United States (n = 5,007; Age: M = 60.8; Marital Status: Married = 77.2).	Subjective Well-Being/Measured by life satisfaction and 12-item CASP version scale.	Retirement/Defined by legal concept – age.	Individuals facing formal retirement at age 65 or later experience an increase in SWB that is roughly equivalent in total value to that of individuals facing early retirement, and both groups return to trend at age 70. It suggests that increasing the age of formal retirement is relatively neutral with respect to SWB in the long term.	Low
Cahill et al., [36], United States.	Cross-sectional Longitudinal: 10 years of follow-up. Baseline: 1992.	10,540 workers. Age: 50 and over. Gender: M = 5,344; F = 5,196.	Health condition/Measured by self-assessment.	Retirement Pattern/Measured by patterns of individuals' withdrawal from the labor force over time through what was answered in the interview.	The use of "bridge jobs" was most common among younger respondents (M = 62%; F = 77%), without defined benefit pension plans (M = 59%; F = 60%), and respondents at both the lower (M = 58%; F = 62%) and upper (M = 61%; F = 77%) end of the wage distribution. The majority of those who left their career jobs and were in excellent or very good health self-assessment took "bridge jobs" (M = 54%; F = 59%).	Low

Table 2 (continued)

Author (first), year, country	Design	Sample	Health Condition Measure/ Instrument	Social Security Measure/ Instrument	Outcomes	Risk of Bias
Murari et al, [46], India.	Cross-sectional	400 employees in the public and private sector. Age: -30 years = 42.5%; Between 30–50 years = 49%; Above 50 years = 8.5%. Sex: M = 55.5%; F = 45.5%. Marital Status: Married = 59%; Unmarried = 41%. Education: Up to class X = 14%; Graduate = 53%; Post graduate = 33%.	Social Psychological Perspective/Measured by 16 and 17 items, respectively, from the scale made by Saeed and Sarwar (2016), Obimba (2005), Fry and Debats (2006) and Kotter-Gruhn et al. (2010).	Retirement Planning Behavior/ Measured by 10-item scale by Saeed and Sarwar (2016), Obimba (2005), Fry and Debats (2006) and Kotter-Gruhn et al. (2010).	The results of exploratory factor analysis revealed three principal components of social perceptions, four of financial perceptions, and three of RPB. The results indicated that there is a predicted linear relationship between psychological perceptions of social and financial perceptions of life after retirement and RPB factors. The obligations, preparation, and uncertainty of financial perceptions significantly influence employees' RPB (MPC = 0.548). The study confirms the significant effect of demographic variables such as age, marital status, occupational sector, income, and education levels on RPB.	Low
Brucker et al, [43], United States.	Cross-sectional	509 individuals. Age: M = 54.7289; SD = 7.6802. Sex: F = (SD = 0.5004). Marital Status: Married = (SD = 0.4518); Education: No College = (SD = 0.4685); Some College = (SD = 0.4398); College Graduate = (SD = 0.4931). Race: Caucasian = 93%.	Health Status/Measured by self-assessment.	Retirement Plan/ Measured by Self-Assessment.	44% of respondents had a retirement plan with specific goals. Planners were much more likely to have a high net worth, personal savings or investment, or a defined contribution plan as their primary source of retirement income. Planners were less likely to have Social Security as their primary source. A gender gap in retirement planning was observed, with women less likely to have an articulated plan. The self-employed were more strongly represented among planners. There was no significant difference between planners and non-planners in the percentage with poor health.	Low
McMahan et al, [47], United States.	Cross-sectional	447 individuals. Age 50 and older. 150 working and 297 retired. Sex: M = 54%; F = 46%. Education: Less than a high school degree = 4%; High school graduate = 15%; Some college or vocational school = 33%; college degree or more = 48%. Marital Status: Married = 51%; Separated/divorced = 26%; Widowed = 7%; Never married = 13%; Single = 3%. Race/Ethnicity: White = 81%; Black = 4%; Asian = 5%; Other = 10%.	Health perception/Measured by self-assessment; Depression/Measured by GDS.	Employment Situation/Measured by self-assessment between "working or retired".	Workers reported being in better health ($t = 4.79$; $p < 0.001$), being less depressed ($t = -2.45$; $p < 0.005$), and having more energy ($t = 1.99$, $p < 0.05$), fewer chronic conditions ($t = 4.91$; $p < 0.001$), and fewer limitations in activities ($t = -2.44$, $p < 0.005$). Retirees also reported feeling more tempted ($t = -2.67$, $p < 0.01$), helpless ($t = -2.41$, $p < 0.005$), and hopeless ($t = -2.06$, $p < 0.05$). Those with good to excellent health were more likely to work (OR = 1.53, $p < 0.0001$) and to have better educational attainment (OR = 1.18, $p < 0.01$).	Low

Table 2 (continued)

Author (first), year, country	Design	Sample	Health Condition Measure/ Instrument	Social Security Measure/ Instrument	Outcomes	Risk of Bias
Kadaya, [51], United States (US), Japan, China, and India.	Cross-sectional	4,709 individuals. Age 40 to 64 years. US (n = 1,190); Japan (n = 2,585); China (n = 441); India (n = 493). Age: US (M = 52.56; SD = 6.73); Japan (M = 52.61; SD = 7.26); China (M = 52.62; SD = 7.36); and India (M = 53.88; SD = 9.30). Sex: US: M=(SD=0.50); Japan: M=(SD=0.50); China M=(SD=0.50); and India: M=(SD=0.50). Marital Status: Married: US=(SD=0.45); Japan=(SD=0.35); China=(SD=0.27); and India=(SD=0.42). Education (Years): US=(SD=1.69); Japan=(SD=2.02); China=(SD=2.58); and India=(SD=4.85).	Anxiety/Measured by the item: "To what extent do you agree with the following statement? (5 as maximum and 1 as minimum) I have anxieties about my "life after 65" * (For those who are already 65 or older, "life in the future").	Social Security/ Measured by the average value of the social security scale used in the questionnaire (expected social security (pension) income to total living expenses after retirement).	Only in Japan, "age" (SD = 5.11) and social security (SD = 3.86) significantly decrease the level of anxiety (SD = 5.11). People in the US are the most optimistic about their old age in general, while people in India and Japan seem to feel more insecure. The older generations in India seem to be the most anxious about their lives as they age. In Japan, while the younger generations seem to be considerably worried about their future, the older generations, feel relatively secure. In China, the level of anxiety is consistently moderate across generations.	Age
Guérin et al., [35], Canada.	Cross-sectional	1,319 unionized workers. Age 50 years or older (M = 54.7) years. Sex: F = 19.1%; Education: first or second cycle university degree = 75.7%; Marital Status: Married = 76.4%.	Health status/Measured by questions on perceived health status and compared health status and by 13 indicators proposed by the Ministry of Health and Social Services (1987). Locus of control/Measured by a scale proposed by Levenson (1972) and reworked by Spector (1988). Perseverance at work/Measured by 10 indicators proposed by Bandura (1982, 1988);	Early Retirement and Extension of Working Life/ Measured by two likert scales with seven levels from very low to very high; Retirement/ Measured by questionnaire, through likert scale with seven levels; Retirement Vision/ Measured by 14 indicators taken from two questionnaires designed by Attias-Donfut et al. (1979) and tested by David et Payeur (1991), Usher (1981) and Morgan et al. (1985).	Respondents who aspire very strongly, strongly, somewhat strongly to retire as soon as possible (33.7%) form a slightly larger group than respondents who aspire very strongly, strongly, somewhat strongly to continue working beyond retirement age (28.4%). The worse the health status, the more one aspires to retire early ($\beta = -0.192$). Conversely, the better the health status, the more one aspires to work after retirement age. The latter relationship is, however, less strong ($\beta = -0.106$) than the former. As for the personality variables, work attachment, professional identification, and organizational loyalty are positively related to work life extension and negatively related to advanced retirement. Professionals who favor extension do not therefore aspire to stay at work out of sheer necessity, they also express this desire because they are attached to their work and identify more with their profession. Professionals who aspire to extend their working life have a greater external locus of control than others.	Age

Table 2 (continued)

Author (first), year, country	Design	Sample	Health Condition Measure/ Instrument	Social Security Measure/ Instrument	Outcomes	Risk of Bias
Ju et al., [44], South Korea	Longitudinal: 06-year follow-up. Baseline: the year of the survey that participants responded that they had retired.	340 individuals. Ages 60 and older who responded having work in 2006 but retired in the 2008, 2010, 2012 surveys. Sex: M=63.5%; F=12.4%. Education: Uneducated=17.1%; Middle school or less=53.1%; High school or more=29.7%. Marital Status: Married=77.9%; Single=22.1%.	Quality of life/measured by Visual Analog Scale developed by Korea Labor Institute that asks "How is your overall quality of life?" Answer 0-100.	Retirement/defined by being out of the labor market. National pension receipt/measured by the question "Did you receive any benefits including national or special occupational pension from the national pension scheme in the last calendar year? If so, did you receive your benefits monthly or in a lump sum?"	Participants receiving a pension were used as a reference. Participants not receiving a national pension had a QoL of -4.40 (SE = 1.73; $P=0.0109$). Participants not receiving a pension and with low income showed the most drastic decrease in QoL (-10.42; SE = 4.53; $P=0.0214$). Individuals without a pension and with a low level of wealth showed a considerable decrease in QoL compared to individuals with a pension and with a low level of wealth (-8.34; SE = 4.14; $P=0.0438$).	Low
Stenling et al., [50], Suécia.	Longitudinal: 03 years of follow-up. Baseline: 2015	2.655 individuals. Age ranged from 60 to 66 years (M=62.9; SD=2.0). Education: Not completed high school or had less than 9 years of schooling = 1.4%; Junior high school degree = 11.9%; 2-year vocational school degree = 21.2%; 3-to-4-year high school degree = 12.5%; post high school degree or education but not a university degree = 19.3%; university degree = 33.3%.	Autonomy, Competence and Relatedness/Measured by BPNFSFS. Depressive Symptoms/Measured by CES-D scale.	Retirement/Defined by the item: "Are you retired (i.e., have started to receive old age pension)?"	The satisfaction of autonomy needs increased in the W2 retired group (SM = 0.106, $p < 0.001$), W3 retired group (SM = 0.154, $p < 0.001$), and working (SM = 0.023, $p = 0.010$). Comparisons of group SM indicated that the W2 and W3 (retired) groups had a greater increase in autonomy compared to the active group and the constantly retired group ($p < 0.001$) and that the active group had a greater increase than the constantly retired group ($p = 0.029$). For depressive symptoms, there were relatively small changes between the working, constantly retired, and retired W2 groups. The W3 retired group reported a statistically significant decrease in depressive symptoms (SM=-0.035, $p = 0.006$). Greater needs satisfaction was related to less depressive symptoms at baseline; however, pre-retirement needs satisfaction was not a statistically significant predictor of subsequent changes in depressive symptoms (or vice versa) throughout the transition to retirement. At the person's internal level, greater need satisfaction at a given point in time was related to lower than normal depressive symptoms.	Average

Table 2 (continued)

Author (first), year, country	Design	Sample	Health Condition Measure/ Instrument	Social Security Measure/ Instrument	Outcomes	Risk of Bias
Olivera et al., [40], Austria, Germany, Belgium, Czech Republic, Denmark, Estonia, France, Greece, Hungary, Ireland, Italy, Netherlands, Poland, Portugal, Slovenia, Spain, Sweden, and Switzerland.	Longitudinal: 04 years follow-up. Baseline: 2007.	15,389 individuals. Age 50 years and older (M = 56,229; SD = 4,320). Does not specify the sample for each country. Sex: M = 49.5%. Marital Status: Married or living with partner = 80.8%.	Subjective Well-Being/Measured by life satisfaction by item: "On a scale from 0 to 10 where 0 means completely dissatisfied and 10 means completely satisfied, how satisfied are you with your life?" and 12-item CASP version scale. Subjective Survival/Measured by Item: "What are the chances that you will live to be age 75/80/85/90...?". Cognitive Ability/Measured by first component of a PCA of four tests of cognitive functioning available in SHARE (immediate and delayed memory recall, verbal fluency and numeracy).	Pension insecurity/Measured by item: "What are the chances that before you retire the government will reduce the pension which you are entitled to?" and "What are the chances that before you retire the government will raise your retirement age?". Retirement/Defined by legal concept - age.	SD increase in pension insecurity is associated with SD = 0.05 decrease in life satisfaction, i.e., the relationship is negative and significant. The individuals most affected by pension insecurity are those who are farther from their retirement, have lower incomes, assess their life expectancy as low, have higher cognitive abilities, and do not expect private pension payments. The eudaemonic well-being levels of individuals whose age is closer to retirement age are more affected by pension insecurity than those whose age is farther from retirement, unlike the life satisfaction results.	Average
Mäcken, [49], Germany.	Longitudinal: 10-year follow-up. Baseline: birth cohorts 1931–1947, and their spouses in the same birth cohorts.	302 subjects. Age between 50–65 years (M = 62.96). Sex: F = (SD = 0.50). Education: Low = (n = 203); High = (n = 99).	Work stress/Measured by the reduced version of the demand–control model and the effort–reward–imbalance model scales. Health/Measured by item: "Would you say your health is... 1- excellent, 2- very good, 3- good, 4- fair, or 5- poor.". Depressive Symptoms/Measured by EURO-D depression scale. High cardiovascular risk diseases/Measured by self-report.	Retirement/Defined by the date the respondents retired.	Lower job control (B = -0.21, 95% CI -0.40; -0.02) and poorer self-reported health (B = -0.25, 95% CI -0.49; -0.005) lead to a lower retirement age. Low job control increases the risk of depressive symptoms for people with less education (B = 0.32, 95% CI 0.02; 0.62). Differences in education were not significant for retirement.	Low

Table 2 (continued)

Author (first), year, country	Design	Sample	Health Condition Measure/Instrument	Social Security Measure/Instrument	Outcomes	Risk of Bias
Jensen et al. [41], Sweden and Denmark	Longitudinal; 11 years of follow-up. Baseline: 2004.	5,384 individuals. Age range 50–59 years. Sex: F = 55.9%.	Mental Health Status/Measured by EURO-D scale. Functional Limitations/Measured by GALL. Pain/Measured by a combination of questions about joint pain and medication use (2004–2010); harmonization (2010–2015) - pain and discomfort domain of the EQ-5D and question of severity of pain.	Employment Situation/Measured by self-assessment between "working or retired"	Overall, employment rates increased across the age group, but only among the healthy. The OR for receiving temporary or no benefits increased from 1.25 (95% CI: 0.81 to 1.90) before to 1.73 (95% CI: 1.14 to 2.61) after the policy reforms for 2.9% with moderate health problems and from 2.89 (95% CI: 1.66 to 5.03) to 6.71 (95% CI: 3.94 to 11.42) among the 11% with severe health problems. The interaction between time and health was statistically significant ($p < 0.001$).	Low
Dong et al., [37], United States.	Longitudinal; Cohort Study: 1936–1941 - interview in 1994; 1942–1947 interview in 2000; 1948–1953 interview in 2006; 1954–1959 interview in 2012.	1,555 Americans born between 1931 and 1959. HRS 1936–1941 ($n = 3,694$); WB 1942–1947 ($n = 2,049$); EBB 1948–1953 ($n = 2,382$); MBB 1954–1959 ($n = 3,430$). Sex: F (HRS = 51.2%; WB = 50.9%; EBB = 50.4%; MBB = 51.3%). Race: White (HRS = 87.7%; WB = 87.1%; EBB = 82.6%; MBB = 80.4%). African American (HRS = 8.7%; WB = 8.5%; EBB = 10.3%; MBB = 11.1%). Other (HRS = 3.6%; WB = 4.4%; EBB = 7.2%; MBB = 8.4%). Education: High school or less (HRS = 55.2%; WB = 42.7%; EBB = 35.4%; MBB = 36.5%), Some College (HRS = 23.2%; WB = 27.1%; EBB = 30.8%; MBB = 28.8%); College and above (HRS = 21.7%; WB = 30.1%; EBB = 33.9%; MBB = 34.6%); Marital Status: Separated/Divorced (HRS = 15.4%; WB = 18.2%; EBB = 17.6%; MBB = 17.3%); Widowed (HRS = 4.6%; WB = 4%; EBB = 3.3%; MBB = 2.6%); Single (HRS = 3.6%; WB = 4%; EBB = 5.5%; MBB = 9.2%); Married/Partner (HRS = 76.4%; WB = 73.8%; EBB = 73.5%; MBB = 70.8%).	Mental Health (Depression)/Measured by CES-D scale. Overweight and Obesity/defined using CDC BMI guide.	Retirement plan/Measured by self-assessment in the HRS survey.	Pension coverage was strongly associated with work expectations at older ages ($P < 0.001$). Workers with DC pension plans were more likely to expect to work full-time after age 62, although less likely to expect to work after age 65 ($P < 0.01$). We found a gradual decline in self-reported health and an increase in health conditions over time ($P < 0.001$). Workers with fair or poor reported physical health were less likely to remain employed after age 62 years and 65 years ($P < 0.01$). Neither smoking nor obesity was associated with the expected probability of full-time work after age 65, although the prevalence changed over time. Respondents in administrative occupations had higher P62 and P65 than those in any other occupation.	Age

Acronyms used: B = Beta; BPNFS = Basic Psychological Needs Satisfaction And Frustration Scale; BMI = Body Mass Index; CASP = Critical Appraisal Skills Programme; CDC = Centers for Disease Control and Prevention; CES-D = Center for Epidemiologic Studies Depression Scale; CI = Confidence Interval; DC = Defined Contribution; EBB = Early Baby Boomer; EQ-5D = EuroQol-5 Dimension; F = Female; GDS = Geriatric Depression Scale; GALL = Global Activity Limitations Index; HM = Happiness Measure; HRS = Human Resources and Retirement Study; ICD-10 = International Classification of Diseases; M = Male; M = Mean; MBB = Middle Baby Boomer; MPC = Moderate Positive Correlation; OR = Odds Ratio; P = P-value; PCA = Principal Component Analysis; QoL = Quality of Life; RPB = Retirement Planning Behavior; RRS = Readiness for Retirement Scale; SD = Standard Deviation; SE = Standard Error; SHARE = Survey of Health, Ageing and Retirement in Europe; SM = Slope Mean; SWB = Subjective Well-Being; T = T-value; WB = War Baby

Table 3 Risk of Bias Assessment

Study (First author)	Study Design	Selection			Comparability			Outcome		TOTAL	Risk of bias			
		Representativeness of the sample	Sample size	Non-respondents	Ascertainment of exposure	Based on design and analysis	SubTotal	Assessment of outcome	Sta- disti- cal Test			Subtotal		
Schofield et al., [48]	Cross-Sectional	*	/	/	*	**	3	*	*	2	*	2	7	AVERAGE
Mulders et al., [42]	Cross-Sectional	*	/	/	*	**	3	*	*	2	*	2	7	AVERAGE
Andersen et al., [38]	Cross-Sectional	*	/	/	/	**	2	*	*	2	*	2	6	LOW
De los Santos et al., [45]	Cross-Sectional	/	/	/	**	*	2	**	*	1	*	2	5	LOW
Horner, [39]	Cross-Sectional	/	/	/	**	**	2	**	*	2	*	2	6	LOW
Cahill et al., [36]	Cross-Sectional	*	/	/	/	**	2	/	*	2	*	2	6	LOW
Murari et al., [46]	Cross-Sectional	/	/	/	**	*	2	**	*	1	*	2	5	LOW
Brucker et al., [43]	Cross-Sectional	/	/	/	/	*	0	/	*	1	*	2	3	LOW
McMahan et al., [47]	Cross-Sectional	/	/	/	/	*	0	/	*	1	*	2	3	LOW
Kadoya, [51]	Cross-Sectional	/	*	/	*	**	2	*	*	2	*	2	7	AVERAGE
Guerin et al., 1995 [35]	Cross-Sectional	/	*	*	**	**	4	**	*	2	*	2	8	AVERAGE
Ju et al., [44]	Longitudinal Study	/	/	/	*	**	1	*	*	2	*	2	5	LOW
Stenling et al., [50]	Longitudinal Study	*	/	/	**	**	4	**	*	2	*	2	8	AVERAGE
Olivera et al., [40]	Longitudinal Study	*	/	/	**	**	4	**	*	2	*	2	8	AVERAGE
Mäcken0, [49]	Longitudinal Study	/	/	/	*	**	1	*	**	2	**	3	6	LOW
Jensen et al. [41]	Longitudinal Study	/	/	/	*	*	1	*	*	1	*	2	4	LOW
Dong et al., [37]	Longitudinal Study	*	/	/	*	**	3	*	*	2	*	2	7	AVERAGE

systems or accumulate other types of savings, individuals that will retire in the foreseeable future are at risk of needing to work longer or receive lower pensions [40]. In a long term, increasing the age of formal retirement is relatively neutral with regard to subjective well-being, and suggests that later formal retirement simply delays the benefits to be enjoyed at retirement [39]. Employment rates increased in the 50–59 age group with welfare reform, but only among healthy individuals, with the odds ratio for receiving temporary benefits or not being eligible for benefits increasing for people with moderate to severe health problems [41]. Companies that aim to extend working time, where the social environment is more advantageous to their continuation after achieving the legal retirement age, and/or those who do not have experience with age discrimination, adjust more easily to the increase in retirement age. Likewise, employees with poor health have more difficulty adjusting to this augmentation, and better health status is related to fewer negative emotions and thoughts about prolonged employment, but also to increase behavior to facilitate a longer working life [42].

These results indicate that health conditions may be associated with the enhancement in the legal retirement age criterion. A good health condition can help individuals to adapt to the changes generated by the reforms. Also, there is a significant cost to people with poor health and to those who are farthest from retirement, despite presenting a certain neutrality with regard to the positive health of those who are near to retirement when a reform is sanctioned. Thus, when amending criteria to extend time in the labor force to solve fiscal problems, policymakers should analyze the impact on the health of individuals who are forced to postpone retirement, which corroborates its use as an indicator for social security policies, according to the demands of its population.

Retirement planning as a strategic element for coping with post-retirement life

Well-being in retirement is directly related to the attitudes of workers throughout their lives. Four studies looked at the relationship between individuals' retirement planning during the aging process for their benefit receipt and their health conditions in old age [43–46].

Social and financial perceptions of post-retirement life were identified as factors that significantly influence retirement planning. On social perceptions, the major components that influence retirement planning detected were depression, role clarity of retired people and social involvement. About financial perceptions, the components identified were financial obligations, government support during retirement, uncertainty from financial perceptions and preparation for post-retirement life [46]. Therefore, contentment and security with participants'

financial situation exert an important factor for retirement preparedness [43, 46]. In this sense, people who actively planned for retirement were much more likely to have a high net worth, personal savings or investment, or a defined contribution plan as their primary source of retirement income, and much less likely to have a low net worth. People who actively planned for retirement were less likely to have the government insurance plan as their primary source. Nevertheless, there was no significant difference between people who actively planned for retirement and people who did not in the percentage of poor health. Most respondents identified their health as excellent or good, except for individuals with no retirement and a low level of wealth whose showed a considerable decrease in QoL compared to individuals with retirement and a low level of wealth [44, 45].

To have a retirement planning during life, and consequently the coverage by a pension plan, can help positively in the post-retirement life, especially in the individual's perceptions, whether they are social, health or financial. Such help is mainly due to the psychological perceptions of financial issues that may influence how the individual will experience his or her old age. Then, social security planning can work as a strategy for coping with post-retirement life, since it not only prepares workers to meet their needs, but also supports them in the face of concerns about the losses of this phase of life.

The relationship between social security policies and psychological health

A total of five studies have analyzed the relationship of social security with psychological health, investigating symptoms of depression [47–50], anxiety [51] and stress [49].

Lower job control and poorer self-reported health lead to a lower retirement age, also, the risk of depressive symptoms is increased for people with a lower level of education [47, 49]. In addition, greater satisfaction of the needs for autonomy, competence, and relatedness was related to less depressive symptoms at baseline. However, satisfaction of pre-retirement needs was not a statistically significant predictor of subsequent changes in depressive symptoms throughout the transition to retirement. As for the basic psychological needs, only autonomy showed statistical significance, which demonstrated the existence of an initial short-term increase throughout the transition to retirement [50]. Besides, workers reported being in better health, less depressed, with more energy, fewer chronic conditions, and fewer limitations in their activities. Those who were retired reported feeling more bored, helpless, and hopeless [47]. Furthermore, being absent from the workforce through early retirement due to depression and other mental health disorders results in considerably less income than being in the workforce

full time, as well as less wealth than those who have no mental health condition [48]. Regarding anxiety, a cross-country study suggests that the development of a social security system where the individual holds coverage for living expenses after retirement and health care decreases people's concern about the future [51].

The results indicate that there is a link between psychological health and social security policies established when individuals decide to take early retirement, as a result of symptoms such as depression and stress, which generate a labor disability, and the need to activate the social security protection system due to a forced exit from the labor market. As well, the opposite logic can be seen where the existence of a robust social security system that provides coverage for life's adversities, such as illness and old age, reduces symptoms such as anxiety.

Discussion

This meta-ethnography identified 17 eligible studies that examined the relationship between health conditions associated with aging and social security policies among people nearing retirement or retired. Most of the studies included in this systematic review involved cohorts aged 40 years or older and investigated associations between social security policies for people of retirement age and perceptions of, or behaviors related to, general health, psychological health or physical functioning. The synthesis of the evidence suggests that health can operate as a way to promote the working life for the elderly and as an indicator for social security policy reforms, that retirement planning is a strategic element for coping with post-retirement life, and that there is a relationship between social security policies and psychological symptoms.

About health as a way to promote the working life, four studies have found that changes related to sociodemographic dynamics point out that the phase between the ages of 50 and 70 has emerged as a type of second part of working life, which can be supported by a good self-assessment of the subject's general health status when perceiving the possibility of staying in the labor market, albeit in an adapted way, such as by adopting bridge jobs [35–38]. The evidence suggests that if people can experience their old age in good health, they can be productive, still work and contribute to society, in a slightly different way from that of a younger person, promoting independence and increasing a healthy life for the elderly.

When it comes to health as indicator for social security reforms, of all the studies included in the synthesis, four studies allowed us to identify that a good health status can help individuals adapt to the changes generated by the reforms of the legal age criterion in the social security models and that people in poor health are the ones who suffer most from the crisis caused by unexpected changes in the welfare system [39–42]. This result is consistent

with the literature reviewed, which has observed a variation in the health behavior of workers and in the health conditions of the samples researched that approaches social security reforms [52–54]. The results indicate that to ensure a healthy aging population, when reforming social security systems, policymakers have to enhance positive impact on health, since social protection aims to provide income security, health care and support at every stage of life, with particular attention to the most marginalized. However, the underlying mechanisms by which social security reforms appear to have this effect on health have not been evidenced, which may reflect an empirical evidence gap that is possibly developing.

Moreover, four studies included in the review enabled to indicate that there are actions in the life course that can help to obtain a satisfactory health after leaving the labor market, such as retirement planning; which according to the results found can reduce worry about retirement, keep anxiety under control, improve income and quality of life in the realization of this life event [43–46]. Retirement planning is defined as a goal-oriented behavior in which individuals devote efforts to prepare for their withdrawal from the labor market [25]; that could function as a strategic element for coping with post-retirement life.

Regarding the relationship between social security policies and psychological health, four studies suggested that the presentation of symptoms such as depression and stress, may demand from the social security system, as they are capable of disabling individuals, who will have a forced exit from the labor market [47–50]. And a cross-sectional study allowed us to infer that in countries where the level of development and comprehensiveness of its security system is higher, its population presents a lower anxiety picture when participants are asked about old age [51]. This is consistent with previous literature, where better health outcomes have been found in countries with a more extensive welfare state [15, 16]. These findings support the idea that mental health should be thought about and promoted, especially in the workplace, once social environments can affect health. A public-health guideline to aging should consider approaches that reinforce rehabilitation, adaptation and psychosocial growth.

In general, a significant number of studies have employed self-reported instruments to measure health conditions when considered in their general aspect [35, 43, 47, 48], which supports the importance of self-report as a meaningful indicator of health status. The increasing validity and adaptability of self-assessment scales have enhanced their use for academic, clinical, research, and epidemiological purposes, offering adequate levels of reliability in measuring and prognosticating short- and long-term measures of health [55]. Furthermore, the

results found in this review can help to create the environments and opportunities that enable people to be and do what they value throughout their lives, increasing wellbeing and participation in society and promoting a healthy aging.

About the limitations of this review, the cross-sectional analysis of most studies restricts the validity of the results, as this prevented us from examining the cause-and-effect relationship of the variables. Also, considerable methodological variation was found in the theoretical perspectives consulted, the follow-up periods, and the questionnaires used in the studies to assess health conditions and social security measures, which hampered the meta-analytic analysis. This could have improved the interpretation and generalizability of the results and thus provided greater validity of the evidence.

The difficulty in defining and measuring retirement was also noted. On a conceptual level, a variety of theoretical approaches were found that operationalized retirement through self-report, legal concept, labor force participation, and pension receipt. However, this theoretical-conceptual variation may not be problematic as these approaches are not mutually exclusive as each assesses and analyzes a particular component of what is meant by retirement.

In spite of this significant heterogeneity in results, the multifaceted nature of health and social security allowed us to find a substantial amount of research that worked on their relationship, and made it possible to conduct the meta-ethnography. 58.82% of the studies had a low assessment score, i.e., a high risk of bias, represented by the lack of representativeness of the samples, the predominant use of self-assessment scales, and low risk factor verification. Finally, the selected publications were only from 1995 on, although our search covered research published from 1979 onwards, mainly due to the low methodological quality of the studies found in this period and the scarce quantity of studies detected between 1979 and 1994, revealing an increase in academic production and its publication from the mid-1990s.

Despite the limitations, the main strength of this systematic review was to conduct an analysis of health conditions related to social security policy reforms, synthesizing the evidence reported in a substantial number of relevant studies. These studies covered diverse population-based cohorts in large samples of middle-aged and elderly individuals, demonstrating the appropriate applicability of the theoretical construct of social security policies in diverse cultural contexts and methodological advances in the development and validation of outcome measures. This reflects not only the growing interest in research on variables based on human experience, but also in the search for empirical evidence to support the contribution of multidisciplinary constructs directed

at public policy. At last, the searches of studies in four languages - English, Portuguese, French and Spanish - facilitated the understanding of the relationship between health conditions and social security policy reforms in samples of middle-aged and elderly participants from different cultures.

Conclusions

The results of this review included important health domains such as general health functioning, psychological health, and work disability factors. Overall, it showed that there is a link between health and retirement, where health is a relevant factor in deciding when to exit the labor market. This may encourage future researchers and policy makers to analyze the ramifications of its relationship to advance the promotion of quality of life for the elderly population.

For future research, the need arises to study and analyze the underlying mechanisms through which social security policy reforms and health conditions are related. Likewise, their potential benefits could be assessed through interventions aimed at promoting health for older workers, preventing psychological symptomatology, and planning for retirement. At the theoretical level, the conceptual diversity of retirement could represent an opportunity to operationalize this variable as a multifaceted construct, which could improve its explanatory and interpretive capacity in the face of different health outcomes for aging.

Abbreviations

PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols
NOS	Newcastle-Ottawa Scale

Supplementary Information

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Supplementary Material 1

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Author contributions

L.T. contributed to the concept, data curation, formal analysis and writing - original draft of this systematic review. F.U. contributed to the data curation, formal analysis and writing - review & editing draft. H.M. contributed to the investigation, supervision and writing - review & editing draft. J.P. contributed to the investigation, supervision, methodology and writing - review & editing draft. All authors were involved in the overarching protocol, interpretation and theoretical underpinning of the data. All authors reviewed the manuscript. Finally, all authors approved the final version for publication.

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Data availability

The datasets used and/or analysed during the current study available from the corresponding author on reasonable request.

Declarations**Ethics approval and consent to participate**

Not applicable.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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