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Impact of retirement transition on health, well-being and health behaviours: critical insights from an overview of reviews

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ABSTRACT

Retirement is a pivotal life course transition wich may have profound implications for health, well-being and health behaviours. Despite extensive research and theoretical debate, the impact of retirement on health remains inconclusive, with studies reporting positive, negative, or no effects.

This overview of reviews synthesises evidence from 15 systematic reviews (4 meta-analyses) assessing the relationship between retirement and physical and mental health outcomes (including mortality, mental health, cognitive decline and cardiovascular diseases) and health behaviours (including physical activity, diet, smoking and alcohol consumption). The review adheres to PRIOR guidelines and assesses the quality of the literature and existing methodological challenges.

Findings indicate that retirement's impact varies widely depending on socioeconomic status (SES), job characteristics, and individual lifestyle factors. Retirees with higher SES generally experience improved mental health and increased physical activity, whereas those with lower SES are more prone to declines in physical and mental health, increased sedentary behaviour, and adverse cardiovascular outcomes. Evidence on cognitive decline and mortality remains mixed.

This review highlights critical methodological issues in the available literature, including inconsistent definitions of retirement, reliance on self-reported health data, and biases like reverse causality and healthy worker effect. Future research should prioritise life course longitudinal designs and cross-country comparisons informed by stronger theoretical grounding to untangle the complex relationship between retirement and health. Policy efforts should target vulnerable groups, particularly those from lower SES, by promoting physical activity, mental well-being, and social engagement during and after the transition to retirement. Tailored interventions across retirement transition could mitigate health disparities and improve overall well-being in later life.

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1. Introduction

Retirement is a pivotal transition in the life course, marking a shift from active employment to a phase often anticipated as a period of rest and freedom. However, this transition may introduce significant changes in multiple dimensions of health, including social, psychological, and physical ones, which can profoundly influence health development with advancing age. Despite extensive research, the impact of retirement on health remains inconclusive. While some studies suggest that retirement may offer health benefits by removing individuals from stressful work environments, others indicate potential negative effects, such as loss of purpose, reductions in social and physical activity, leading to unhealthy behaviours and adverse health outcomes (Behncke, 2012; Fontana et al., 2024; Mein, 2003; Westerlund et al., 2010).

The transition through retirement serves as both a mediator and a modifier of health outcomes (Oksanen and Virtanen, 2012; Stenholm and Vahtera, 2017). Health status before retirement often influences the decision to retire, with individuals in poorer health opting for earlier retirement (de Wind et al., 2014). Conversely, the act of retiring can modify health trajectories, potentially improving or worsening health outcomes depending on factors such as socioeconomic status (SES), lifestyle changes, and quality of the retirement experience (Bloemen et al., 2017). The literature reflects a diverse methodological landscape, with studies varying in their definitions of retirement, study designs, and the extent to which they account for biases such as reverse causality, healthy worker and harvesting effects. These biases, prevalent in ageing research, complicate efforts to draw clear conclusions about retirement's impact on health (Kuhn, 2018).

Crucially, retirement itself is neither conceptualised nor experienced uniformly. Recent analyses underscore that retirement in Western industrialised contexts may involve formal pension schemes, a specific statutory retirement age, and acceptance of a socially recognised 'retiree role' (Lytle et al., 2015). However, in many non-Western or low- and middle-income settings, retirement may not exist as a distinct construct tied to state-sponsored pensions or legally defined age thresholds (Luborsky and LeBlanc, 2003). Furthermore, even within high-income countries, many definitions, ranging from complete labour force withdrawal to self-assessed retired status, complicate measuring who is considered retired (Denton and Spencer, 2009). Acknowledging these theoretical and cultural variations is essential to interpreting the heterogeneous findings about retirement's impact on health and health behaviours.

Transitioning to retirement is not merely a cessation of work but a significant life event prompting adjustments at multiple levels that can affect health behaviours (Bertuccio et al., 2023; Mosconi et al., 2023; Vigezzi et al., 2021, 2025). The circumstances surrounding this transition are critical, as they can dictate changes in lifestyle that are fundamental to maintaining health. For instance, studies have shown that retirement can lead to shifts in priorities, with some retirees adopting healthier lifestyles while others experiencing declines in physical activity and social engagement (Kauppi et al., 2021; Lahti et al., 2011; Pulakka et al., 2020). This inconsistency in outcomes across different health dimensions highlights the complexity of the retirement-health relationship (Oksanen and Virtanen, 2012). Adopting healthier lifestyles at an older age poses significant challenges, making health promotion during the retirement transition a public health priority. This period can be viewed as a window of opportunity for primary prevention interventions, which could be particularly effective if synchronised with public health initiatives (Zantinge et al., 2014).

Exploring the role of retirement in health promotion and disease prevention requires a life course perspective. This approach involves examining the influence of retirement across different levels of ageing - from phenotypic (lifestyle behaviours) to functional (autonomy and disease) and biological levels (cellular and epigenetic ageing) (Eibich, 2015; Ferrucci et al., 2018). Enhancing the phenotype through improved lifestyle behaviours could positively impact functional and biological ageing, suggesting a need for synchronised interventions aimed at promoting healthy ageing. Such interventions could be tailored to address the specific needs and challenges of retirees, particularly those at higher risk due to low SES or pre-existing health conditions (Hessel, 2016; Serrano-Alarcón et al., 2023).

Retirement's impact on health is multifaceted, with the literature indicating both positive and negative outcomes. Methodological quality among studies varies, with many suffering from biases and inconsistencies in defining retirement and measuring health outcomes. Moreover, studies often fail to account for individual and contextual factors - such as the quality of the work environment, sociodemographic conditions, and the nature of the retirement itself, which are crucial for understanding the retirement-health nexus (Anxo et al., 2019; Burr et al., 2017; de Wind et al., 2014).

While previous meta-analyses and systematic reviews have addressed specific aspects of retirement and health, this study aims to provide a comprehensive and updated synthesis of retirement's overall impact on health outcomes and behaviours. By systematically pooling and critically appraising data, this review seeks to elucidate the direction and magnitude of retirement's impact on physical and mental health and health behaviours. Given the heterogeneity and often conflicting findings in existing literature, this overview addresses the urgent need for a thorough assessment of the evidence to assess the methodological quality of existing studies, identify knowledge gaps, outline research priorities, and inform the planning of reliable prospective studies. This, in turn, supports the development and evaluation of adequate welfare and health policies aimed at optimising health outcomes during the retirement transition (Fitzpatrick and Moore, 2018).

2. Methods

The Preferred Reporting Items for Overviews of Reviews (PRIOR) (Gates et al., 2022) were followed for the planning, conduction and reporting of this review. A review protocol was drafted and approved by authors before initiation (not archived on public databases), describing the research question, search strategies, inclusion and exclusion criteria, outcomes, and plan for data extraction and analysis. Our research question was to investigate the relationship between retirement and health, specifically examining how retirement influences health, well-being, and lifestyle behaviours and assessing the strength of evidence and the limitations of current research.

2.1. Eligibility criteria

Details on inclusion and exclusion criteria are reported in Table 1, according to the Population, Concept and Context (PCC) framework (Peters et al., 2015). No age-related or geographic restrictions were imposed on the systematic reviews considered. Our inclusion criteria were limited to: i) systematic reviews; ii) reviews related only to retirement impact on health and lifestyles in the general population; iii) written in English. We excluded all other types of studies and non-full-text papers (abstracts, conference papers). No date limitations were applied.

Table 1
A priori defined inclusion and exclusion criteria according to the Population (P), Concept (C) and Context (C) (PCC) framework.

Search Strategy	Details
Inclusion criteria	P: general population (adults and older adults after retirement) C: impact of retirement on health outcomes or health behaviours C: retirement, with no restrictions to countries or social status
Publication type	systematic reviews
Language filter	English
Time filter	from inception through 15th July 2024
Database	PubMed/Medline, Embase, Cochrane library

2.2. Search strategy, selection and data extraction

We performed an initial and limited search of PubMed/Medline and the Cochrane Library to identify articles on the topic, using these search terms: 'retirement', 'health', 'risk factor', and 'systematic reviews'. The index and text words contained in the titles were used to develop a full search strategy, including all identified keywords and index terms, then adapted for each database and validated by experienced reviewers (AO, AA). The second search was launched on the 15th of July 2024 and performed across Pubmed/Medline, Embase and the Cochrane Library. The reference list of all identified articles was then screened for additional studies.

The selection process was independently conducted by three authors (GPV, EM, CB) and carried out in two steps: a first screening based on title and abstract, followed by a full-text screening for all the eligible articles. Disagreements among reviewers were resolved by consensus and consulting a senior author (AO). The results of the search and the studies' inclusion process are shown according to the PRIOR flow diagram (Tricco et al., 2018).

Data extraction was conducted independently by the three authors (GPV, EM, CB), using a standardised spreadsheet elaborated by the team. Data extraction included: full reference details; a definition of retirement; study population; information on the presence of a comparison group, if available; any health, well-being or lifestyle outcomes; results and methodological details of the included systematic reviews.

2.3. Data synthesis and quality assessment

We performed a descriptive and qualitative analysis to report and pool the characteristics of the included records, summarising results in tables. Quality appraisal of included studies was carried out applying A MeaSurement Tool to Assess systematic Reviews 2 (AMSTAR 2) (Shea et al., 2017).

3. Results

Following the preliminary search across databases, we retrieved 360 articles: 117 from PubMed/Medline; 236 from Embase and 7 from the Cochrane Library. After the removal of 112 duplicates, we screened titles and abstracts of 248 records; 232 of them were excluded. In total, 16 records were sought for retrieval and assessed for eligibility to full-text screening: 13 systematic reviews were included, whereas 3 articles were excluded with reasons (one record was an abstract, the others were either missing the exposure or the outcomes of interest). In parallel, 3 more articles were identified from manual citation searching and 2 of them were found eligible, for a total of 15 systematic reviews included (Baer et al., 2020; Barnett et al., 2012a, 2012b; Li et al., 2021; Meng et al., 2017; Odone et al., 2021; Schaap et al., 2018; Sewdas et al., 2020; Sharifi et al., 2023; Shim et al., 2013; Sprod et al., 2015; Ugwu et al., 2024; van der Heide et al., 2013; Vansweevelt et al., 2022; Xue et al., 2020). The full selection process is reported in Fig. 1.

3.1. Characteristics of the included studies

The records' publishing dates span from 2012 to 2024, whereas the publication years of the original studies included by the 15 reviews overall ranged from 1966 to 2023. Full details on the characteristics of the included studies are reported in Tables 2 and 3.

The number of included studies ranged from 5 to 28, and only one review included 82 studies (Xue et al., 2020). Almost all included studies were observational, with exclusively longitudinal or cross-sectional design in 13 records (87 %). Four of the included systematic reviews performed meta-analyses (Li et al., 2021; Odone et al., 2021; Sewdas et al., 2020; Ugwu et al., 2024).

With reference to the study population, general adult population or retired people with no age restriction were the prevalent targets for the majority (nine) of the included records (Barnett et al., 2012a, 2012b; Li et al., 2021; Odone et al., 2021; Sharifi et al., 2023; Shim et al., 2013; van der Heide et al., 2013; Vansweevelt et al., 2022; Xue et al., 2020). One review focused on healthy adults between 50 and 70 years, specifically those facing the transition from the occupational to retirement phase (Baer et al., 2020). Where population age limits were set, there was a certain variability, spanning from subjects older than 35 in one record (Ugwu et al., 2024) to people older than 40 or 45 years in two other records (Meng et al., 2017; Sprod et al., 2015) or older than 55 years in another one (Schaap et al., 2018).

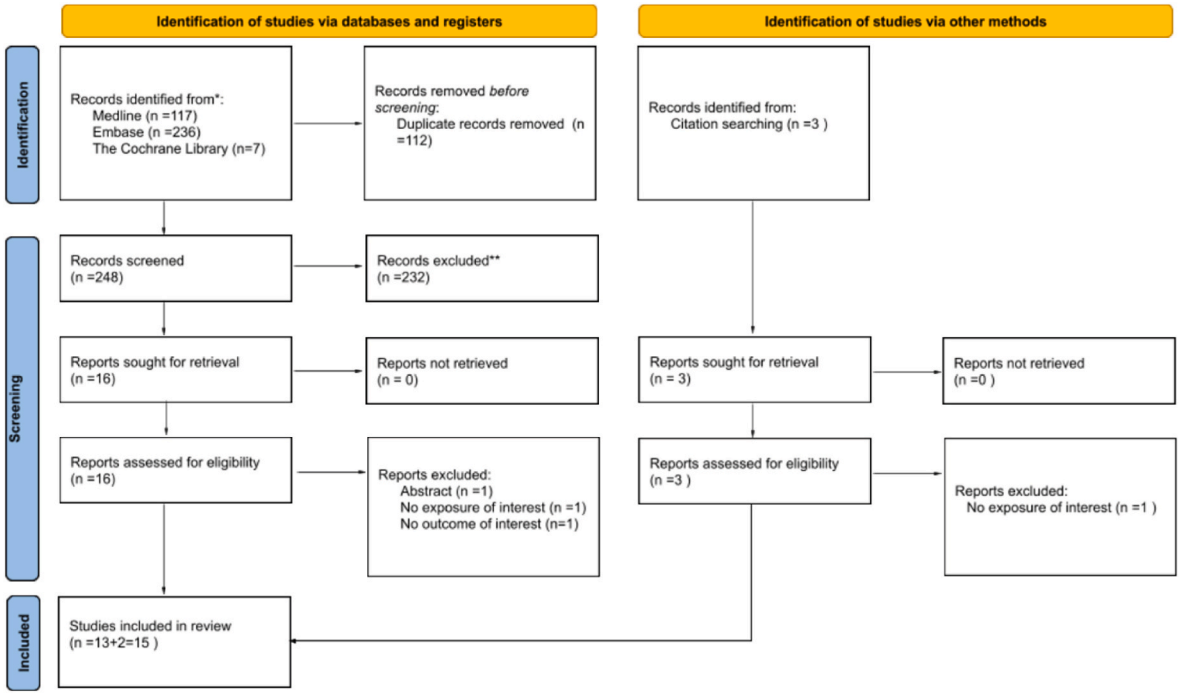

Fig. 1. Flow diagram of the studies selection process.

Table 2
Main characteristics and results of included systematic reviews.

Reference	Journal	Focus of the study	Definition of retirement	Source of information on retirement	Study population	Comparison	Outcomes	Results	Quality score
Baer et al., 2020	Nutrition Reviews	Changes in dietary styles of people facing retirement	Status passage from the occupational to the retirement phase	Not reported	Community-dwelling adults aged between 50 and 70 years with no diet-related ill-health, facing the status passage from the occupational to the retirement phase	Not applicable (interventional studies were excluded)	Changes in dietary style at retirement or anticipation of changes	Study results were inconsistent. The majority of studies identified various dietary-style changes after retirement – some in favorable ways (e.g., increased vegetable consumption) and some in rather unfavorable ways (e.g., increased snacking). Influencing factors were changes in mealtime structures, available time, and financial situations accompanying retirement	Moderate quality
Barnett et al., 2012a	International Journal of Behavioral Nutrition and Physical Activity	Analysis of physical activity around the transition to retirement	Not specified	Not available	Old age retirement in community-dwelling individuals	Not specified	Level of physical activity	Increased physical activity after retirement, but decreased in low socioeconomic status	Low quality
Barnett et al., 2012b	American Journal of Preventive Medicine	Analysis of changes in physical activity across the transition to retirement; their variation by socioeconomic status; predictors of changes in physical activity across the retirement transition	Widely defined as retirement around 65 years	Self-reported (survey)	Retired people	Not retired (cross-sectional); pre-retired (longitudinal)	Level of physical activity, predictors of change in physical activity	Exercise and leisure-time physical activity increased after the retirement transition, whereas total physical activity results were inconsistent. Low socioeconomic status was associated with a decrease and high socioeconomic status with an increase in physical activity. Evidence on predictors of change was scarce and methodologically weak	Low quality
Li et al., 2021	American Journal of Epidemiology	The relationship between retirement and depression	Voluntary retirement, involuntary retirement, and regulatory retirement	Self-reported, receipt of an official retirement pension, out of the labor force, or not available	Retired people (general population)	Not retired/not specified	Depression or depressive symptoms	Retirement was associated with more depressive symptoms, and this association varied by the type of retirement and country	High quality
Meng et al., 2017	BMC Geriatrics	The effects of retirement on age-related cognitive decline	Not specified	Self-reported	Employed or retired peopled older than 40 years (excluded job with physical demands and psychological distress)	Not specified	Cognitive decline (i.e., episodic memory, verbal ability, verbal memory)	Weak evidence that retirement accelerates the rate of cognitive decline in crystallised abilities, but only for individuals retiring from jobs high in complexity. The evidence on the rate of decline in fluid cognitive abilities is conflicting	Moderate quality

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Table 2 (*continued*)

Reference	Journal	Focus of the study	Definition of retirement	Source of information on retirement	Study population	Comparison	Outcomes	Results	Quality score
Odone et al., 2021	Epidemiology and Psychiatric Sciences	The association between retirement and both incident and prevalent depression	Retired status and transition to retirement (all retirement types, apart from retirement only for disability, which was excluded)	Not specified	Retired (general adult population)	Still employed	Depressive symptoms	Results suggested a protective effect of retirement on the risk of depression, although with high statistical heterogeneity between risk estimates	High quality
Schaap et al., 2018	Social Science & Medicine	The effect of job cessation on health across different socioeconomic groups	Withdrawal of older workers from paid working life	Register data, self-report	Subjects older than 55 years	Higher and lower socioeconomic status	General health, physical health, mental health, behaviour	13 studies found more positive effects of an exit from work on mental health among employees with a higher socioeconomic status compared to employees with a lower socioeconomic status. These effects were mainly found after early/ statutory retirement. No substantial differences in general and physical health	Low quality
Sewdas et al., 2020	Journal of Epidemiology and Community Health	The association between early and on-time retirement, compared with continued working, and mortality	Early and on-time retirement measured before exposure (retirement); disability pension excluded	Register-based or actual retirement versus retirement offer/window/ reform	Retired people at statutory retirement age of 65 years or early retirement	Early retirement versus working until retirement and on-time retirement versus working beyond retirement	All-cause or cause-specific mortality	Early retirement was not associated with a higher risk of mortality. On-time retirement was associated with a higher risk of mortality, which might reflect the healthy worker effect	High quality
Sharifi et al., 2023	BMC Public Health	Changes in physical activity and leisure activities, as well as the relationship between physical activity, leisure, and psychological adjustment among retirees	Not specified	Not specified	Retired people without age restrictions	Not specified	Leisure or participation in leisure, physical activity, recreation or participation in recreation and life satisfaction, quality of life, mental health	Significant and positive correlation between physical activity, leisure, and psychological adjustment among retirees. Doing physical activity and enhancing participation in leisure activities were associated with higher adjustment, wellbeing, life satisfaction, quality of life, and mental health	Moderate quality
Shim et al., 2013	Applied demography and Public Health	Analysis of different types of retirement as a risk factor for mortality	Change from working to non-working, related to age, length of service, or health deterioration	Self-report, municipal records, employee records, census data	General population	Not specified	All-cause mortality and specific mortality	All-type retirement is a risk factor for mortality. No conclusion can be made about specific retirement types and mortality	Moderate quality
Sprod et al., 2015	Age and Ageing	Changes in sedentary behaviours across the retirement transition	On-time retirement. Disability and unemployment not included	Self-reported	Subjects older than 45 years	Not specified	Sedentary behaviours	Several studies examined self-reported time spent in specific sedentary leisure activities and generally reported increases in duration, prevalence or frequency (television: 7/9 studies; reading: 4/6	Moderate quality

(*continued on next page*)

Table 2 (*continued*)

Reference	Journal	Focus of the study	Definition of retirement	Source of information on retirement	Study population	Comparison	Outcomes	Results	Quality score
								studies). Few other sedentary behaviors were considered	
Ugwu et al., 2024	PLOS Global Public Health	Relationship between retirement, especially "retirement anxiety", and life satisfaction	"retirement anxiety" referred to as the wide range of worries and fears linked to transitioning from work to retirement, covering concerns from financial stability and loss of identity to adapting to new routines and maintaining social connections	Registries, surveys	Retirees in the majority of the studies or civil servants, with wide age range variability (35-80 years)	Not specified	Life satisfaction, measured through validated tools	32% of studies reported a positive relationship, 47% were negative, and 21% found no significant correlation. Meta-analysis indicated high heterogeneity and non-significant mean effect size, suggesting no consistent impact of retirement on life satisfaction	High quality
van der Heide et al., 2013	BMC Public Health	Differences in health effects of types of retirement (voluntary, involuntary or regulatory) and types of employment (blue-collar versus white-collar)	Voluntary, involuntary and statutory retirement	Not specified	Non-patient population	Same population after retirement at follow-up	Mental health, perceived general health or physical health	Beneficial effect on mental health. Contradictory evidence for an impact on perceived general health and physical health	High quality
Vansweevelt et al., 2022	Journal of Physical Activity and Health	Differences between low versus high socioeconomic status groups in the changes in (specific domains of) physical activity and sedentary behaviour across the transition from work to retirement	Statutory retirement; retirement at the end of working life rather than due to ill health, disability, or long-term unemployment	Self-reported, receipt of an official retire pension, registries	Generally healthy subjects	13 out of 24 studies used a control group, namely participants that were still employed at follow-up or already retired at baseline	Physical activity and sedentary behavior	The main findings were that the changes in total physical activity (13 papers), occupational physical activity (3 papers), and total sedentary time (3 papers) seem to be more favorable for high socioeconomic status (SES) groups than for low SES groups. For the outcomes recreational physical activity (13 papers), active transport (6 papers), and screen time (5 papers), the results are less clear but there seems to be a tendency toward more favorable changes for high SES groups. Changes in household/caregiving physical activity (6 papers) appeared not to differ between low and high SES groups	Moderate quality
Xue et al., 2020	The Gerontologist	Impact of retirement on cardiovascular diseases and their risk factors	Self-reports of economic activities as retirees, being eligible for a public pension, stopping working at the State Pension Age. Normal, early, old-age retirement was included. Retirement for disability was excluded	Registries, surveys	General population	Not specified	Cardiovascular diseases and cardiovascular risk factors	Inconsistent results. Studies in the USA found no significant effect on cardiovascular diseases, studies in European Union showed a detrimental effect. Increase in adiposity measures among those retired from physically	Moderate quality

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Table 2 (*continued*)

Reference	Journal	Focus of the study	Definition of retirement	Source of information on retirement	Study population	Comparison	Outcomes	Results	Quality score
								demanding jobs. No effect on diabetes and hypertension. Decreasing or no effect on smoking. Increasing in leisure-time physical activity. No clear conclusion on drinking	

Countries of the study populations were also widely represented, encompassing Europe, Switzerland, Ireland, the United Kingdom (UK), the United States of America (USA), Canada, Australia, Japan, China, Korea, South Korea, Singapore, Mexico, Brazil, Israel, India, Turkey, Iran, Pakistan, Russian Federation, South Africa, Ghana and Nigeria. European countries were represented in 15 records, and the USA in 14.

Almost half of the records included the following populations as comparators: not retired people (Li et al., 2021); not retired and/or pre-retired people (Barnett et al., 2012b); employed people or people employed over traditional retirement ages (Odone et al., 2021; Sewdas et al., 2020); people with different SES (Schaap et al., 2018); still employed people at follow-up or already retired at baseline (Vansweevelt et al., 2022); same non-patient population retired at follow-up (van der Heide et al., 2013). For the other half of the records, a study population comparison was neither specified nor applicable (Baer et al., 2020; Barnett et al., 2012a; Meng et al., 2017; Sharifi et al., 2023; Shim et al., 2013; Sprod et al., 2015; Ugwu et al., 2024; Xue et al., 2020).

With reference to exposures of interest, the definition of retirement or its operational framework, such as retirement type and timing, varied slightly among the included reviews. Three reviews focused specifically on the transition from working life to retirement, defining this period as a transition phase (Baer et al., 2020; Shim et al., 2013) and addressing "retirement anxiety", which encompasses a wide range of worries and fears associated with this stage (Ugwu et al., 2024). Another review considered both the transition phase to retirement and the state of being retired in its analysis (Odone et al., 2021). Some studies used a simple definition of general retirement around 65 years (Barnett et al., 2012b; Schaap et al., 2018), possibly describing the types of retirement included. One review included all types of retirement (Odone et al., 2021); two studies specified the inclusion of voluntary, involuntary and regulatory retirement (Li et al., 2021; van der Heide et al., 2013); one review only included statutory retirement (Vansweevelt et al., 2022); one review specified the inclusion of normal, early or old-age retirement (Xue et al., 2020); another one included only early and on-time retirement (Sewdas et al., 2020). Most reviews excluded retirement due to health problems or eligibility for a disability pension. Three articles did not report any definition of retirement (Barnett et al., 2012a; Meng et al., 2017; Sharifi et al., 2023).

The data sources for retirement type and timing mainly came from registries, surveys, face-to-face interviews, or receipts of an official retirement pension. Five studies did not report these details (Baer et al., 2020; Barnett et al., 2012a; Odone et al., 2021; Sharifi et al., 2023; van der Heide et al., 2013).

3.2. *Outcomes of interest*

Different outcomes were examined to consider the impact of retirement on health and well-being or its impact on specific health behaviours.

Among health and well-being outcomes, i) two articles focused on all-cause or cause-specific mortality (Sewdas et al., 2020; Shim et al., 2013); ii) two reviews examined general health outcomes (Schaap et al., 2018; van der Heide et al., 2013); iii) five reviews analysed mental health and/or depressive symptoms (Odone et al., 2021; Schaap et al., 2018; Sharifi et al., 2023; Shim et al., 2013; van der Heide et al., 2013); iv) one author targeted cognitive function (Meng et al., 2017); v) one review analysed cardiovascular diseases and cardiovascular risk factors (Xue et al., 2020); vi) two reviews measured life satisfaction and quality of life (Sharifi et al., 2023; Ugwu et al., 2024).

Concerning health behaviours, i) physical activity was studied in four reviews, one of which focused on predictors of changes in physical activity as well (Barnett et al., 2012a, 2012b; Vansweevelt et al., 2022; Xue et al., 2020); ii) sedentary behaviour was considered in two studies (Sprod et al., 2015; Vansweevelt et al., 2022); iii) dietary habits in two studies (Baer et al., 2020; Xue et al., 2020); iv) smoking habits and alcohol consumption were studied in one review (Xue et al., 2020).

Table 3
Methodological details of included systematic reviews.

Reference	Study design	Quality assessment	Number of included articles	Countries of publication of included studies	Years of publication of included studies (range)	Study samples of included studies (range)
Baer et al., 2020	Observational studies with quantitative, qualitative, or mixed-methods designs	Yes, by means of the MMAT	10	Europe (France, Germany, Italy, Spain, Sweden, UK, Denmark, Portugal, Poland), Australia, Brazil	1998-2019	6 - 27,257
Barnett et al., 2012a	Qualitative studies	Structured 10 items	5	UK, Germany, USA, Canada	2004-2010	5 - 120
Barnett et al., 2012b	Longitudinal and cross-sectional	Yes, CASP appraisal checklist, 12 items	19	USA, UK, Australia, Netherlands, Portugal	1985-2010	51 - 11,469
Li et al., 2021	Longitudinal studies	Yes, 10 predefined criteria	25	USA, China, France, Australia, Japan, Korea, Denmark, Ireland, Switzerland, the UK, Mexico, and a group of 10 European countries	1980-2020	458 - 245,082
Meng et al., 2017	Longitudinal studies: observational cohort studies, case-control	Yes, 10 items	7	USA, Sweden, UK	2009-2015	271 – 14,710
Odone et al., 2021	Longitudinal studies	Yes, 14-item scoring system developed by Shim et al. for population-based studies on retirement as a risk factor (Shim et al., 2013)	41	Europe, Switzerland, USA, Australia, Brazil, Israel, China, Singapore, Korea, Japan, Russian Federation, South Africa, Ghana	1984-2021	30 - 245,082
Schaap et al., 2018	Longitudinal studies	Used, but not specified	22	Europe, USA	2003-2016	186 - 245,082
Sewdas et al., 2020	Longitudinal studies	Yes, nine criteria based on Hayden et al. checklist (Hayden et al., 2006)	25	Europe, USA, Canada, Israel, Japan	1954-2018	Not reported
Sharifi et al., 2023	Observational studies (cross-sectional or longitudinal)	Yes, JBI Critical Appraisal Checklist for cross-sectional studies, NOS for longitudinal studies	26	Australia, USA, Israel, France, Finland, Taiwan, England, Scotland, Iran, India, Sweden, Turkey	1980-2019	32 - 33,241
Shim et al., 2013	Longitudinal studies	Yes, structured with 14 items	13	Europe, Middle East, USA	1976-2008	1,235 – 170,749
Sprod et al., 2015	Longitudinal and cross-sectional	Yes, STROBE checklist, 22 items	12	USA, UK, Australia, France, Israel, South Korea	1970-2014	98 - 7,782
Ugwu et al., 2024	Cross-sectional and longitudinal studies	Yes, the QUIPS tool, structured in 6 domains	19	Canada, US, Europe, Turkey, Pakistan, Nigeria, Australia, China	2003-2023	37 - 49,069
van der Heide et al., 2013	Longitudinal studies	Yes, 14 items (ad hoc)	22	USA, Israel, China, Europe	1966-2013	52 - 14,714
Vansweevelt et al., 2022	Longitudinal or prospective studies	Yes, CASP cohortc hecklist, STROBE statement, NOS assessment	24	Europe (SHARE data), Finland, USA, Germany, Australia, UK, Scotland, Sweden, Netherlands, England, France, Belgium	2005-2021	7 - 27,257
Xue et al., 2020	Longitudinal studies	Yes, CASP appraisal checklist	82	Korea, Europe, USA, Iran, Japan, China	1981-2018	72 - 617,511

Abbreviations: CASP: Critical Appraisal Skills Programme; MMAT: Mixed-Methods Appraisal Tool; JBI: Joanna Briggs Institute; NOS: Newcastle-Ottawa Scale; QUIPS: QUality In Prognosis Studies; STROBE: Strengthening the Reporting of Observational Studies in Epidemiology; UK: United Kingdom; USA: United States of America.

3.3. Impact of retirement on health and well-being

As for the association with mortality, all-type retirement was identified by Shim et al. as a general risk factor for mortality (Shim et al., 2013), but they could not draw definitive conclusions regarding specific types of retirement. Sewdas et al. (2020) expanded on this by reporting that early retirement is not associated with an increased mortality risk (hazard ratio - HR 1.05, 95 % CI 0.87–1.28), whereas on-time retirement does appear to elevate mortality risk (HR 1.56, 95 % CI 1.41–1.73), particularly when compared to those who continue working beyond the traditional retirement age. Yet, when adjusted for prior health, results are no longer significant (HR 1.12, 95 % CI 0.98–1.28). Moreover, this increased risk associated with on-time retirement may be influenced by the healthy worker effect, where healthier individuals are more likely to continue working, and those with poorer health retire on time, thereby confounding the results.

Schaap et al. (2018) and van der Heide et al. (2013) illustrate contradictory evidence regarding the effects of retirement on general health outcomes. Schaap et al. (2018) analysed the effects across different socioeconomic groups, reporting that retirement can positively affect general and physical health, particularly among employees with higher SES, primarily when retirement occurs early or at the statutory pension age. These effects vary across health domains and are more evident for mental health and health behaviours, whereas there might be no general and physical health differences. Schaap et al. relied on self-reported information on health outcomes and provided a detailed examination of health inequalities by SES, suggesting that the observed health effects are likely mediated by these inequalities, as explained by the life course ecological model. This model posits that contextual factors, including SES, critically influence health outcomes in the post-retirement period. In both physical and mental health domains, SES moderates different effects among groups with opposed mechanisms.

Conversely, van der Heide et al. (2013) explored various occupational groups (blue-collar versus white-collar) and retirement conditions (voluntary, involuntary, regulatory) but did not report a consistent effect of retirement on perceived general and physical health. This study reported that the perceived health effects varied significantly after retirement, with confidence intervals around the mean differences, suggesting no clear univocal impact on general health outcomes, such as chronic illnesses or severe health problems. Van der Heide et al. also

primarily used self-reported health measures, evaluating perceived general health, mental health, and physical health.

As for mental health, Li et al. (2021) reported that retirement could be associated with an increase in depressive symptoms with an effect size of d = 0.044 (95 % CI 0.008–0.080), suggesting a negative impact on mental health and highlighting variations by retirement type. Contrarily, van der Heide et al. (2013) posited that the improvement in mental health shortly after retirement could be linked to a reduction in work-related stress, especially among men, potentially due to gender differences in post-retirement roles. Moreover, Odone et al. (2021) provided a comprehensive meta-analysis, revealing that retirement generally reduces the risk of depression by approximately 20 % (effect size - ES = 0.83, 95 % CI = 0.74–0.93), with more significant protective effects observed in high-quality, longitudinal studies using validated tools. This hypothesis is supported by findings from Schaap et al. (2018), who observed that mental health tends to improve in retirees with higher SES but declines in those with lower SES. The protective effects of retirement on mental health were also noted in studies highlighting the positive correlation between mental health and engagement in active leisure and physical activities, as reported by Sharifi et al. (2023). In terms of measurement of mental health, these reviews used validated tools, with the Center for Epidemiologic Studies Depression Scale (CES-D) (Radloff, 1977) and the General Health Questionnaire (GHQ) (Goldberg and Hillier, 1979) being the most common.

As for cognitive function, Meng et al. (2017) reported that the evidence on the rate of decline in fluid cognitive abilities and impairment of retirees, such as processing speed and working memory, is conflicting and that retirement might accelerate the rate of cognitive decline in crystallised abilities, like verbal skills, but only for individuals retiring from high-complexity jobs. Therefore, the decline in cognitive function post-retirement appears to be significantly influenced by the cognitive demands of the retiree's previous job. Still, the mechanisms behind this association are not understood. Measurement tools used included the Wechsler Adult Intelligence Scale (WAIS) (Saklofske and Schoenberg, 2011), Rey Auditory Verbal Learning Test (RAVLT) (Bean, 2011), Digit Span Task (Saklofske and Schoenberg, 2011), and the Mini-Mental State Examination (MMSE) (Folstein et al., 1975), all validated for screening various cognitive functions.

The review by Xue et al. (2020) focused on cardiovascular diseases and cardiovascular risk factors. They reported that the effects of retirement on cardiovascular disorders and their risk factors, as additional outcomes analysed, are inconsistent, with substantial geographical variation. Specifically, studies from the United States and several European countries reported that retirement is associated with an increase in adiposity measures, particularly among those retiring from physically demanding jobs, while no significant impact was noted for diabetes and hypertension. It is relevant to note that none of the studies included in the review found any beneficial effects of retirement on cardiovascular disease. Nevertheless, these results should be considered cautiously because retired people are usually compared with employed people, thus overestimating the detrimental impact of retirement on health because of the reverse causality effect. In the studies reviewed, the tools employed to measure cardiovascular outcomes and risk factors included self-reported surveys and objective measures like BMI, blood pressure readings, and blood biomarkers such as cholesterol levels and glycated haemoglobin (HbA1c) to assess metabolic risk factors.

As for life satisfaction and quality of life, Sharifi et al. (2023) reported that life satisfaction positively correlates with retirees' participation in physical activity and active leisure activities. In contrast, more sedentary activities, like watching TV or reading, tend to be associated with lower life satisfaction. Ugwu et al. (2024) conducted a meta-analysis using validated tools such as the Satisfaction with Life Scale (SWLS) (Diener et al., 1985) and the Overall Retirement Satisfaction (ORS) scale (Floyd et al., 1992). Their findings suggest that there is no consistent impact of retirement on life satisfaction, with an effect size of r = 0.12 (95 % CI -0.05- 0.29) and studies reporting mixed results: some showing positive effects, others negative, and some with no significant impact at all.

3.4. Impact of retirement on health behaviours

With regard to physical activity, all reviews reported similar results, showing that physical activity increases during retirement, but only for retirees with high SES. In contrast, for people with low SES, physical activity tends to decrease or to be subjected to less favorable changes (Barnett et al., 2012a, 2012b; Vansweevelt et al., 2022; Xue et al., 2020). The type of physical activity that increases post-retirement showed mixed findings: one review did not specify which type increased (Barnett et al., 2012a), another one found exercise and leisure-time physical activity increasing, whereas total physical activity results were inconsistent (Barnett et al., 2012b); main changes were found though in total physical activity and occupational physical activity according to Vansweevelt et al. (2022). Evidence on predictors of change was instead scarce (Barnett et al., 2012b). In detail, the first review by Barnett et al. (2012a) found that retirement often leads to an increase in recreational physical activities, especially among individuals with higher SES. This increase is attributed to retirees having more time to engage in health-promoting activities, to continue lifelong physical activity patterns and the desire to maintain or establish new daily routines. Physical activity might decrease among retirees from lower occupational classes because of a lack of time and a perceived low personal value of recreational physical activity. However, the second paper from Barnett et al. (2012b) noted inconsistencies in total physical activity levels post-retirement, with increases in exercise and leisure-time physical activity being offset by decreases in occupational and household physical activity. An increase in exercise and leisure-time physical activity is not unusual after retirement as there might be additional time to dedicate to physical activities. In contrast, individuals with lower SES often experience a decline in physical activity post-retirement. This decline is associated with reduced access to recreational opportunities and a lower perceived value of physical activity. Vansweevelt et al. (2022) highlighted that while high SES retirees showed improvements in both recreational physical activity and active transportation, lower SES groups did not experience such benefits and household/caregiving physical activity remains consistent across all SES strata. Sharifi et al. (2023) emphasised the positive relationship between physical activity, leisure activities, and psychological well-being among retirees. However, it was noted that many retirees, particularly those with lower SES, engage predominantly in passive leisure activities like reading or watching TV, rather than physical exercise. A lack of uniform measurement methods precluded a comprehensive evaluation of overall physical activity levels. Additionally, Xue et al. (2020) observed that retirement increases leisure-time physical activity but may reduce work- and transport-related physical activity, potentially impacting overall cardiovascular risk. However, the results of several studies showing increased risks among exposed workers have questioned the beneficial effect of occupational physical activity (OPA) on cardiovascular risk (Hall et al., 2019; Holtermann et al., 2018; Quinn et al., 2021).

In terms of measurements, both self-reported questionnaires, such as the International Physical Activity Questionnaire (IPAQ) (Craig et al., 2003), the Physical Activity Scale for the Elderly (PASE) (Washburn et al., 1993) or the Godin Leisure-Time Exercise Questionnaire (GLTEQ) (Godin and Shephard, 1985), and activity logs (i.e., accelerometers) were used to provide objective data on the intensity and frequency of physical activity.

Regarding sedentary behaviour, Sprod et al. (2015) reported that although overall sitting time tends to decrease after retirement, specific sedentary leisure activities, such as watching television, tend to increase in both duration and frequency. This trend is more pronounced among lower SES retirees, who generally exhibit less favorable changes in sedentary behaviour than their higher SES counterparts. Vansweevelt et al. (2022) focused on total sedentary time and found that its changes

seem to be more favorable for high SES groups of retirees than for low SES.

The studies reviewed employed various self-report instruments, including the Sedentary Behaviour Questionnaire (SBQ) (Rosenberg et al., 2008) and accelerometry data, to assess changes in sedentary time.

Retirement tends to be associated with changes in dietary style due to influencing factors, such as changes in mealtime structures, available time and financial situation. Still, study results were inconsistent about the positive or negative direction of these changes (Baer et al., 2020). For example, some retirees increased their vegetable consumption, while others engaged in more snacking and, generally, less healthy dietary intake, such as decreased consumption of fruits, proteins, and certain vitamins, alongside increased intake of fatty and sweet foods (Xue et al., 2020). To assess these dietary changes, the included studies used several validated tools. Notably, the Food Frequency Questionnaire (FFQ) (Willett et al., 1985) was frequently used to capture habitual dietary intake over a specified period, assessing the frequency and portion sizes of various food items. Additionally, 24-hour dietary recalls were adopted, allowing researchers to obtain detailed information on all foods and beverages consumed by the participants on the preceding day. These methods were often complemented by semi-structured interviews, which provided qualitative insights into changes in mealtime routines and food-related behaviours post-retirement.

Xue et al. (2020) also found that retirement was generally associated with either a reduction in smoking or no effect. For instance, some studies indicated that retirees were more likely to quit smoking, while others showed no significant change compared to employed individuals. The measurement of smoking habits varied across studies, including self-reported surveys and smoking status records.

Regarding alcohol consumption, the evidence was also mixed (Xue et al., 2020): while certain studies suggested an increase in alcohol intake post-retirement, others reported a decrease or no significant change. This inconsistency could be attributed to differing study designs, measurement tools (e.g., surveys on the frequency of consumption and problematic drinking behaviour), and country-specific cultural norms around alcohol.

3.5. *Quality appraisal*

Quality appraisal of included studies (as reported in Table 3) was performed following the mixed-methods appraisal tool (MMAT) (Hong et al., 2019) in Baer (Baer et al., 2020), the Critical Appraisal Skills Programme (CASP) checklist (https://casp-uk.net/casp-tools-checklists/) in Barnett (Barnett et al., 2012a, 2012b) and in Xue (Xue et al., 2020), the 14-item scoring system developed by Shim et al. (2013) in Odone (Odone et al., 2021), the Joanna Briggs Institute (JBI) critical appraisal checklist for cross-sectional studies (Critical Appraisal Tools, 2024) and the Newcastle-Ottawa Scale (NOS) for longitudinal studies (https://www.ohri.ca/programs/clinical_epidemiology/oxford.asp) in Sharifi (Sharifi et al., 2023), the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist (von Elm et al., 2007) in Sprod (Sprod et al., 2015), the Quality In Prognosis Studies (QUIPS) tool (Hayden et al., 2013) in Ugwu (Ugwu et al., 2024). Quality appraisal tools were created *ad hoc* in several cases (Li et al., 2021; Meng et al., 2017; Schaap et al., 2018; Sewdas et al., 2020; Shim et al., 2013; van der Heide et al., 2013; Vansweevelt et al., 2022).

The quality appraisal for the included systematic reviews using the AMSTAR2 tool revealed varying levels of methodological rigour (see **Supplementary materials** for details). Specifically, the reviews by Li, Odone, Sewdas, Sharifi, van Der Heide and Ugwu demonstrated high methodological quality (Li et al., 2021; Odone et al., 2021; Sewdas et al., 2020; Sharifi et al., 2023; Ugwu et al., 2024; van der Heide et al., 2013), whereas the reviews by Barnett and Schaap were assessed as of lower quality (Barnett et al., 2012a, 2012b; Schaap et al., 2018). These results indicate a predominance of moderate to high-quality reviews (81%), while 19% were categorised as low-quality (mainly for lacking a pre-specified protocol, not performing study selection or data extraction in duplicate or incompletely assessing the risk of bias).

4. Discussion

The impact of retirement on health outcomes and behaviour is highly multifaceted, with clear distinctions emerging across SES, pre-retirement job characteristics, and previous individual lifestyle factors. Key findings include improvements in mental health, primarily among those with higher pre-retirement SES, and the increase in physical activity among the same group, contrasting with declines in lower SES individuals. Conversely, retirement posed potential risks for increased sedentary behaviour, depressive symptoms and inconsistent dietary changes in disadvantaged populations. Evidence on cognitive decline and cardiovascular outcomes remained mixed, pointing to the need for more targeted research.

As a starting point, health impacts retirement comprehensively since it can affect both the decision and timing of the withdrawal from work and the nature of activities retirees can undertake post-retirement. Moreover, it is essential to know what happens to health after retirement, too (Behncke, 2012). Indeed, retirement triggers a complex set of economic, psychological and social adjustments that, through different and interrelated mechanisms, may affect retirees' health in various directions (Kuhn, 2018). On the one hand, retirement offers the potential for improved health by giving up risky, unhealthy, stressful work (d'Errico et al., 2022). Furthermore, retirement is one of the most fundamental and disruptive life course events and, being situated in the final part of an individual's life, it also encapsulates a life span perspective, reflecting the cumulative chain of exposures and risks accumulated over the years. Potentially, retirement may also entail the loss of daily routines, physical and mental activity, sense of identity and purpose, social interactions and connections, and reduction in income. All of these may lead to unhealthy behaviours.

According to existing literature, retirement may improve retirees' health, reduce it or have no effect. This heterogeneous result varies across different groups of individuals who respond differently after retirement. The consequences of retirement are expressed through changes in retirees' health behaviours, which may include physical activity, diet, time use, sleep habits, smoking, and alcohol consumption (Barnett et al., 2012b; Robroek et al., 2013; Sprod et al., 2015; Vigezzi et al., 2021; Xue et al., 2020). Any of these health behaviours could represent risk factors for different health outcomes or disease and, eventually, death.

The inconsistency of available evidence raises a series of theoretical and methodological issues that should be addressed in the future.

Retirement is a complex and interrelated process with a relevant temporal dimension. Drawing on concepts from career development theory (Lytle et al., 2015), retirement can be viewed as a late-stage career transition shaped by and involving sociocultural norms, economic constraints, and personal resources. For instance, leaving an occupation may mean leaving an unhealthy, risky and stressful environment due to working conditions; otherwise, it may imply leaving an engaging, satisfying job because of involuntary separation, statutory requirements, or other life events such as being forced to care for a spouse, parents, or grandchildren. These different scenarios have potential opposite consequences on health. This effect is mainly driven by the type and environment (physical and psychological) of occupation before retiring. Secondly, retirement increases time availability for leisure activities that may lead to healthier behaviours, which are commonly time-consuming activities, or detrimental habits, too. Thirdly, retirement may imply a loss in disposable income (due to a reduction in monthly reward and loss of benefits) (Homaie Rad et al., 2017), with expected adverse effects on health. Moreover, mental health and well-being can be significantly affected by retirement because of the disconnection from those job aspects, such as cognitive and physical

activity, daily routine, access to a stable social network, a positive social and self-identity and a sense of meaning. This is mediated by individuals' identification with a job or work in general. Finally, the degree of control over retirement timing is likewise important: voluntary retirement has a different effect on health than involuntary withdrawal from work due to the differences in preparedness and foreseeing in retirement schedule. Unintentional job loss leads to a deterioration in health and even increased mortality (Kuhn, 2018).

Most available studies try to define and estimate a single health effect on retirement without considering that the context represents a crucial aspect of the whole picture. Context should consider both the personal and the socioeconomic (micro and macro) environment. As a matter of fact, personal status include other significant issues that may influence one's retiree life, such as spouse's working status, having grandchildren or older relatives to care for (e.g., in highly fragmented and often limited social protection systems (Ferrera, 1996)), being alone, or merely having particular hobbies. When focusing on the association between higher SES and healthier behaviours, lower SES groups often face financial barriers to structured exercise (e.g., sports facilities' memberships, equipment), may have less health literacy, and may lack convenient access to safe recreational spaces, thus exacerbating disparities. SES, at various levels, has been widely described as one of the main determinants of health and deserves careful consideration (Schaap et al., 2018). Individual SES affects personal resources and behaviours, household SES shapes shared living conditions and practices, and country-level SES influences access to healthcare and social support. These levels interact, impacting health outcomes during retirement and highlighting the need for a comprehensive approach to understanding SES effects. Moreover, cross-cultural evidence suggests that the Western retiree role (i.e., formal withdrawal from paid work while retaining full social status) may not translate to societies where retirement is neither an entitlement nor a universal practice (Luborsky and LeBlanc, 2003). A country's welfare state regime or market economy orientation may play a role in determining which employees can retire. For instance, the higher rate of disability pensions in European Union countries than in the USA underlies cultural and national differences. Health insurance is tied to employment in the USA, creating selection pressure and hazardous pathways for older individuals who lose coverage upon retirement, whereas in the European Union, more robust social protections may facilitate earlier or safer retirements.

This high level of complexity determines a series of methodological challenges in designing epidemiological studies focusing on retirement, such as: i) study design, including the potential biases, and data sources; ii) outcomes' measures and their self-reported nature; iii) exposure's definition.

First, we must consider the pros and cons of the study designs and data sources used for retirement research, whether longitudinal or cross-sectional. Longitudinal studies enable investigating health as a *continuum*, before and after retirement, including the effect of ageing and exploring causality. In contrast, cross-sectional studies do not allow consideration of the temporal dimension, hindering to establish the directionality of the association between retirement and health outcomes. Yet, the timing after retirement and the comparators selected should also enter the picture. In addition to the difference between longitudinal and cross-sectional studies, we can characterise two main types of studies on retirement and health. The first group includes papers that compare health changes among workers who retire with the health of workers who continue to work (Jokela et al., 2010; Mein, 2003; Oksanen and Virtanen, 2012; Vahtera et al., 2009; Westerlund et al., 2009, 2010). These studies introduce potential biases because retirement decisions are often health-related, and it may be likely that retirement is associated with worsening health. As a matter of fact, most of these studies find that physical and mental health improves after retirement. The second group includes studies that exploit variations between countries or over time in retirement policies (pension reforms) as "quasi-natural experiments" to assess the impact of retirement on health (Coe and Zamarro, 2011; Behncke, 2012; Hallberg et al., 2015; Hernaes et al., 2013; Hessel, 2016; Bloemen et al., 2017). Here, the potential selection bias is into early retirement for health issues. Most of these studies suggest that retirement is linked with an improvement in several physical and health outcomes. Nevertheless, there is no conclusive evidence about the worsening of chronic conditions and cognitive decline.

In this context, reverse causality is a big issue: indeed, causality may run from retirement to health and the other way around. For instance, poor health may pull individuals out of the labour market, leading to early retirement and potentially selected worsened health outcomes. Researchers aiming to establish a stronger basis for causality could employ methods such as propensity score matching, instrumental variables, or difference-in-differences analyses in longitudinal data to mitigate confounding, selection bias, and reverse causation. These frameworks, while challenging to implement, may help isolate retirement's independent effect.

Secondly, measuring physical and mental health outcomes after retirement is possible through self-report or objective measures, assessing both general and disease-specific health or mortality (Bloemen et al., 2017; Fitzpatrick and Moore, 2018), but also using proxies, such as health services access (inpatient and outpatient care). Except for two reviews (Schaap et al., 2018; Xue et al., 2020), the outcomes were widely self-reported by participants: this poses an issue with the reliability of collected data. Older workers' health results from long-run processes, which are challenging to assess and change, starting from early determinants and spreading through occupational trajectories. Thus, a crucial topic is identifying the most reliable indicators and selected outcomes for health as a multidimensional construct (Kuhn, 2018). Outcomes should embody all different types of functional physical and mental limitations, and should include self-report measures, as well as objective ones, next to health behaviours through validated scales or indicators. It would be helpful to assess not only general health, which could be studied through a very distant indicator such as mortality, but also the differentiated impact of retirement on various diseases and conditions.

Thirdly, a consensus definition of retirement is still missing. As Denton and Spencer emphasised (Denton and Spencer, 2009), the lack of consensus on a standard measure or operational criterion for being retired hampers direct comparability across studies. Most studies include different types of pensions and define retirement through different pension schemes or age thresholds, potentially leading to inconsistent or spurious findings. In the case of age-linked retirement policy, clarifying the specific age cutoff (for example, 60 versus 67 years) is essential, as each age might reflect distinct socioeconomic or policy context. Furthermore, since retirement is not a randomisable exposure, it is challenging to design experimental studies on this topic. Thus, heterogeneity might be due to groups of individuals responding differently when transitioning out of the workforce (Kuhn, 2018).

Last but not least, specific limitations retrieved in the available literature include the remarkable absence of low-income countries among the ones where the included studies were conducted, the inclusion of studies from the 1960s and 1970s, whose results might not be as relevant to the present, the large variety in study sample sizes, which makes results hardly comparable, and the lack of distinction between short-term and long-term effects, which differ because of the complex causal pathways involved (Fé and Hollingsworth, 2016; Johnston and Lee, 2009). Regarding our methodological decisions, some constraints should be acknowledged. First, we searched three major databases only in English and did not specifically pursue grey literature. Therefore, we might have missed systematic reviews not indexed in these databases or not published in English. Second, we did not quantitatively address primary-study overlap across reviews.

Despite these limitations, to the best of our knowledge, this overview of systematic reviews is the most updated and comprehensive summary of the available evidence on the effects of retirement on health domains

and health behaviours. The rigorous methodology and definitions, as well as strict adherence to PRIOR guidelines, are additional relevant strengths of this paper. A broad literature review was carried out, using search terms through a combination of MeSH and free text words to maximise the number of studies retrieved and minimise the chance of publication bias. Finally, detailed quality assessments for each included review are available as **Supplementary Materials**, ensuring transparency regarding how each review fared in methodological quality. Compared to single reviews, overviews of reviews clarify overlapping or inconsistent findings, highlight methodological gaps, identify priority areas for further investigation and offer decision-makers a more comprehensive snapshot of the evidence.

5. Conclusion

In this overview of reviews, we synthesised current evidence on the impact of retirement on various health indicators and evaluated its methodological quality. It uncovered varied and sometimes conflicting findings, ranging from positive outcomes, such as improved mental health and physical activity, to negative impacts, including increased sedentary behaviour and depressive symptoms, particularly among lower SES groups, and reflecting the complex and varied nature of retirement's impacts.

Given the diverse outcomes of retirement on health, policy interventions should be tailored to address the specific needs of retirees, particularly those from lower socioeconomic groups who are more likely to experience adverse health outcomes after retirement. Health promotion efforts during the retirement transition and before should be prioritised, with policies encouraging active lifestyles, mental health support, and social engagement. Future research should focus on overcoming existing methodological limitations, including the need for standardised definitions of retirement and attention to long-term versus short-term health effects, this to better inform policies that optimise health during this critical life stage.

First, data digitalisation offers the opportunity to exploit rich and comprehensive longitudinal data. The availability and possibility of linking administrative and health datasets in different waves would enable the adoption of rigorous definitions of both the exposure and the outcome variables, as retirement, health, morbidity, and other welfare benefits are nowadays precisely recorded. It could be possible to follow individuals' working and health histories, shading light not only on what happens after retirement, but also on their working lives before retirement, disentangling and assessing potential crucial heterogeneities and modifying factors underlying the link between retirement and health.

Second, a promising approach is studying transnational differences in country-specific legislation and institutions, pension schemes, eligibility criteria and benefits, and labour market situation, thus providing evidence not only on the impact of retirement as a whole, but on the benefits and detriments of specific policies.

In conclusion, it is vital to foster future high-quality studies on retirement that integrate theoretical frameworks, address cross-cultural divergences in how retirement is conceptualised, and overtake the methodological issues highlighted to better understand the intricate trajectories of health and health behaviours around this crucial life course transition.

CRediT authorship contribution statement

Giacomo Pietro Vigezzi: Writing – review & editing, Writing – original draft, Validation, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Chiara Barbati:** Formal analysis, Data curation. **Elena Maggioni:** Writing – original draft, Investigation, Formal analysis, Data curation. **Sari Stenholm:** Writing – review & editing, Validation. **Anna Odone:** Writing – review & editing, Validation, Supervision, Conceptualization, Italian Working Group on Retirement and Health, Writing – review & editing, Validation. **C. Ardito:** Writing – review & editing, Validation. **A. d'Errico:** Writing – review & editing, Validation.

Availability of data and material

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Ethics approval

No ethical approval was needed.

Consent to participate and for publication

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Declaration of competing interest

The authors declare that they have no competing interests.

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Appendix A. Supplementary data

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Data availability

Data will be made available on request.

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