Socioeconomic position and falls among middle- and older-aged adults

A systematic review

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Celebrating 175 years

I acknowledge the traditional custodians of the land that we are meeting on today. I would also like to pay my respects to all Elders past, present, and emerging.

Background

Falls

- **Falls are a major public health concern among middle- and older-aged adults**
- Approximately 1 in 4 older adults fall annually worldwide
- Falls can cause severe injuries and even deaths
- Falls represent the second leading cause of unintentional injury deaths worldwide
- Preventing falls is increasingly urgent given our rapidly ageing population

Social determinants of health

- Health inequities are widely documented
- Socioeconomic position (SEP) refers to peoples' social position as determined by various social and economic factors
- Systematic reviews have found that SEP is associated with healthy ageing and frailty
- SEP likely also has a relationship with falls, but the evidence has yet to be comprehensively synthesized
- SEP at different stages across the life course may differentially impact falls

(Talbot et al, BMC Public Health 2005; Salari et al, J Orthop Surg 2022; Braveman & Gottlieb, Public Health Rep 2014; Krieger et al, Annu Rev Public Health 1997; Wagg et al, Ageing Res Rev 2021; Hanlon et al, Ageing Res Rev 2024)

Systematic review protocol

NIHR | National Institute for Health and Care Research

PROSPERO
International prospective register of systematic reviews

Socioeconomic Position Across the Life Course and Falls Among Middle- and Older-Aged Adults: A Systematic Review

Frerik Smit, Anita Van Zwieten, Catherine Sherrington, Marcia Zambelli, Stéphane Cullati, Fiona Blyth, Saman Khalatbari-Soltani

Open access Protocol

BMJ Open

Socioeconomic position across the life course and falls among middle- and older-aged adults: protocol for a systematic review

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Methods

Search strategy

MEDLINE, Embase, and PsychInfo (Inception to March 15th, 2024)

Table 1 Search strategy

Category	MeSH headings and/or search terms
(1) Socioeconomic position	MeSH heading(s): exp Socioeconomic Factors/ Search terms: socioeconomic*.tw, socio?economic*.tw, income.tw, wealth.tw, education*.tw, occupation*.tw, employment.tw, hous*.tw, social disparit*.tw, social inequ*.tw, social class.tw, social status.tw, social position.tw
(2) Falls	MeSH heading(s): Accidental Falls/ Search terms: fall*.tw, faller*.tw
(3) Middle- and older-aged adults	MeSH heading(s): Exp Aged/, Middle Aged/ Search terms: senior*.tw, elder*.tw, old*.tw, aged.tw, ag?ing.tw, middle-age*, middle?age*.tw, mid?life.tw, midlife.tw
(4) Observational studies	MeSH heading(s) (for use in MEDLINE and Embase): Observational Study/, exp Cohort Studies/, exp Case-Control Studies/, Cross-Sectional Studies/ Search terms (for use in PsycInfo): observational*.tw, cohort*.tw, case?control*.tw, cross?sectional*.tw, longitudinal*.tw, prospective*.tw, retrospective*.tw

(Smit et al, BMJ Open 2025)

Eligibility criteria

- Observational studies
- Mean/median age > 40
- Results on the association between at least one SEP indicator (e.g., education, income, employment) and one falls outcome (e.g., fall occurrence, recurrent falls, injurious falls)

Study selection

- Titles and abstracts screened by one reviewer (20% screened also screened by second reviewer)
- Full-texts screened by two reviewers
- Consultations with third reviewer where needed

Data extraction

- Extracted by one reviewer into Microsoft Excel sheet
- Cross-checked by second reviewer

Data synthesis

- Narrative synthesis due to heterogeneity across included studies

Risk of bias assessment

- Modified Quality in Prognosis Studies (QUIPS) tool
- Added items on overadjustment bias from ROBINS-E

Inclusion and synthesis of predictive modelling and risk factor studies

- **Adjusted results from predictive modelling and risk factor studies do not represent an etiological effect estimate**
  - Predictive modelling and risk factor studies generally do not consider whether a variable is a confounder or mediator during the variable selection process
  - Subject to confounding bias, overadjustment bias, and Table 2 fallacy

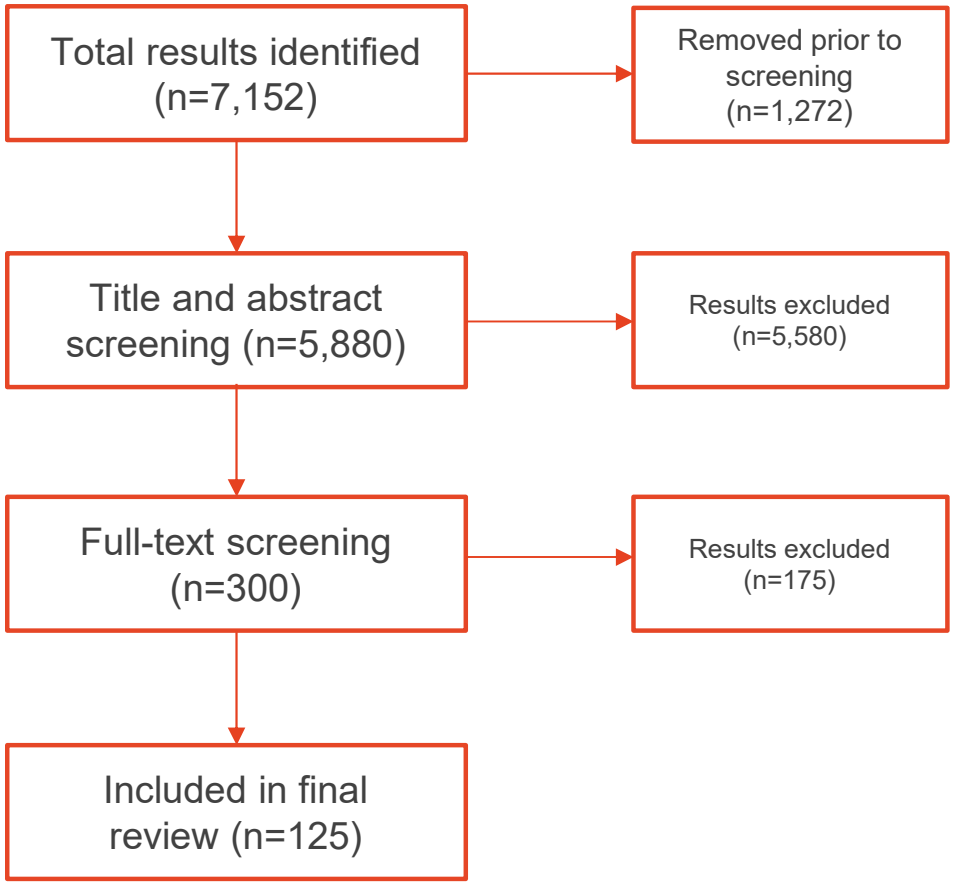
- **We only included these studies if they reported unadjusted results and/or minimally adjusted results**
  - We also only extracted results from these corresponding models

- **We report results separately for:**
  1. Studies aiming to study SEP and falls
  2. Studies not aiming to study SEP and falls with relevant minimally adjusted results
  3. Studies not aiming to study SEP and falls that only contain relevant unadjusted results

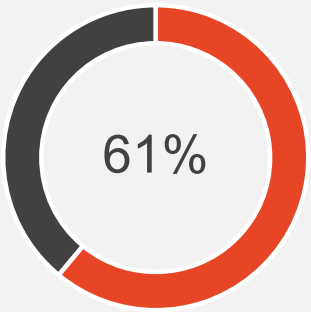
Study selection

Among 125 included studies:

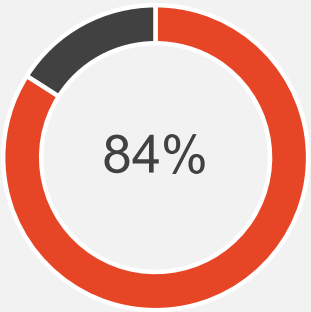
- *Studies explicitly aiming to study SEP and falls (n=14)*
- *Other studies with relevant adjusted results (n=9)*
- *Studies only containing relevant unadjusted results (n=102)*



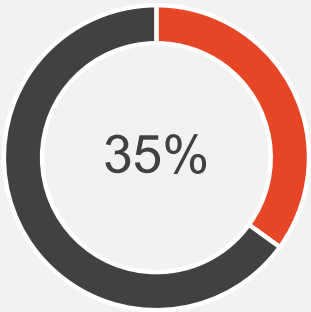
Study characteristics



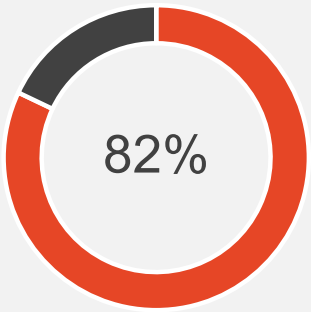
Cross-sectional studies



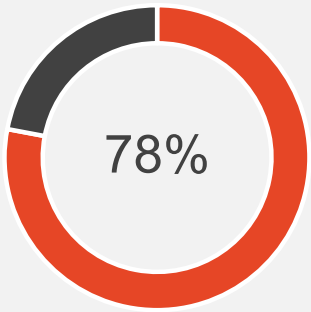
Published after 2010



Studies based in the Americas



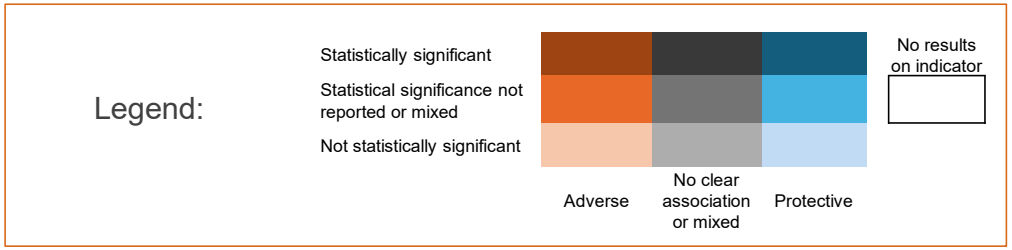
Majority of participants older adults 60+ y/o



Majority of participants female

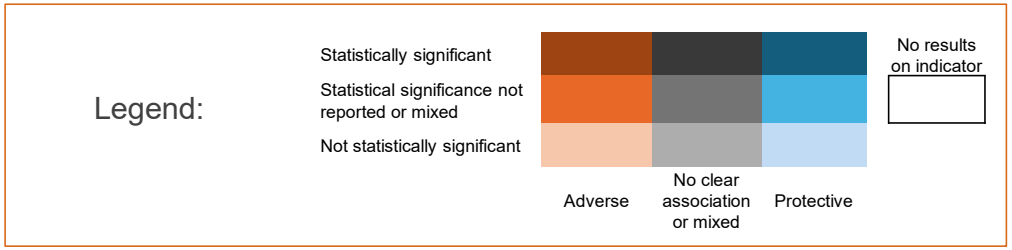
Results (studies explicitly aiming to study SEP and falls)

Study Citation	Education	Income	Employment	Occupation	Housing	Wealth	Other individual- or family-level SEP indicator	Neighbourhood- or area-level SEP indicator
Brown et al (2024)								
Gauchard et al (2006)								
Gribbin et al (2009)								
Hong et al (2020)								
Khalatbari-Soltani et al (2021)								
Kiadaliri et al (2018)								
Li et al (2014)								
Liu and Hu (2022)								
Lo et al (2016)								
Ryu et al (2017)								
Sairafian et al (2019)								
Syddall et al (2009)								
Trujillo et al (2011)								

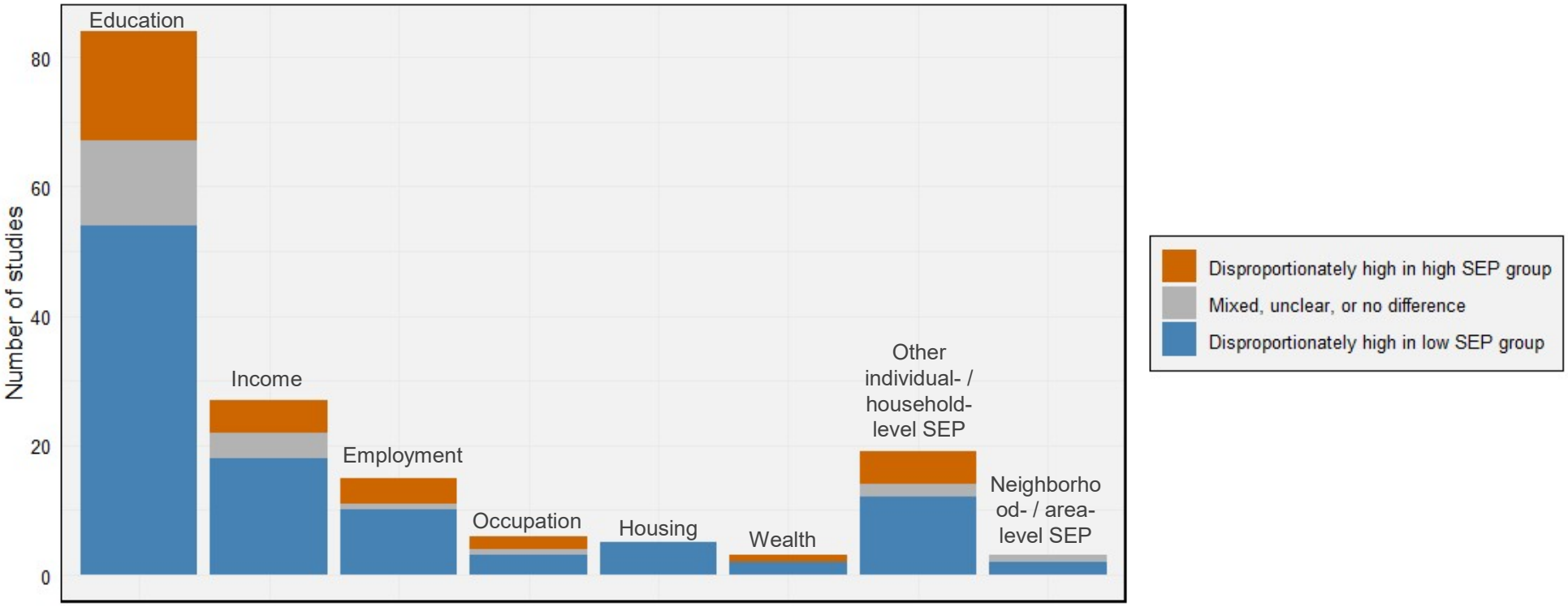


Results (other studies with relevant adjusted results)

Study Citation	Education	Income	Employment	Occupation	Housing	Wealth	Other individual- or family-level SEP indicator	Neighbourhood- or area-level SEP indicator
Ho et al (1996)								
Kelsey et al (2010)								
Nordstrom et al (1996)								
Pimentel et al (2018b)								
Rodrigues et al (2014)								
Salva et al (2004)								
Seo et al (2022)								
Sharma et al (2018)								
Sprince et al (2003)								



Results (studies only containing relevant unadjusted results)



Results (SEP across the life course)

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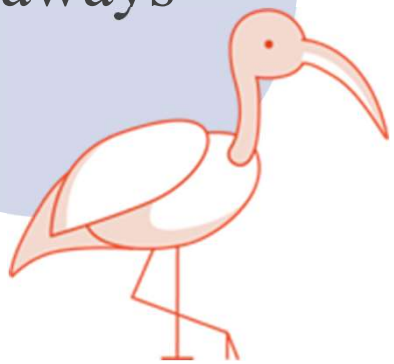
included studies reported results on a SEP exposure from a life course stage prior to the study period

- Three studies measured previous occupation (1 protective association, 2 adverse)
- One study measured social class at two life course stages (at birth and in adulthood). For men, falls disproportionately high among low SEP at both stages. For women, disproportionately high among low SEP in adulthood, but disproportionately high among high SEP at birth.
- One study tested the accumulation model, finding that higher cummulative SEP had a protective association with falls

Key takeaways



The overall existing body of evidence on the relationship between SEP and falls is limited

Higher SEP is generally associated with a lower risk/rate of falls

Individuals/groups of lower SEP generally have a higher fall risk/rate compared to those in higher SEP

Implications

Practice

- Consider implementing equity-focused fall prevention efforts targeted to individuals/groups of lower SEP
- Promote physical activity and exercise programs among lower SEP individuals/groups, and tackle corresponding barriers

Research

- Studies need to cover a wide array of different measures/indicators of SEP
- Mediation analyses to understand the pathways between SEP and falls
- Study the impact of SEP at different stages in the life course

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Thank you so much for your interest! I am happy to answer any questions.

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