Spillover Effect in Health Utility Values: A systematic review

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BACKGROUND

- Spillover effects—impacts of a patient's health status on the health utility of others, such as caregivers or family members—are increasingly acknowledged in health economic evaluations. However, integration of these effects using utility-based measures remains limited and methodologically inconsistent.

OBJECTIVES

- This review aims to systematically identify studies reporting spillover effects quantified via **health utility values**, focusing on **both absolute and relative utility changes**, to facilitate their inclusion in CUA.

METHODS

- A systematic literature search was conducted in **MEDLINE, Embase, PsycINFO, and Econ-Lit** from inception to **January 2025**.
- A standardized data extraction template was applied to extract bibliographic details, dataset information, characteristics of the spillover effect context, measurement methods, and outcomes.
- Studies were categorized by absolute or relative spillover effects and analyzed thematically.
  - ✓ **Absolute spillover effects** refer to the utility difference between exposed individuals (e.g., caregivers of patients) and non-exposed controls;
  - ✓ **Relative spillover effects** describe changes in caregiver utility in relation to changes in the patient's health status.

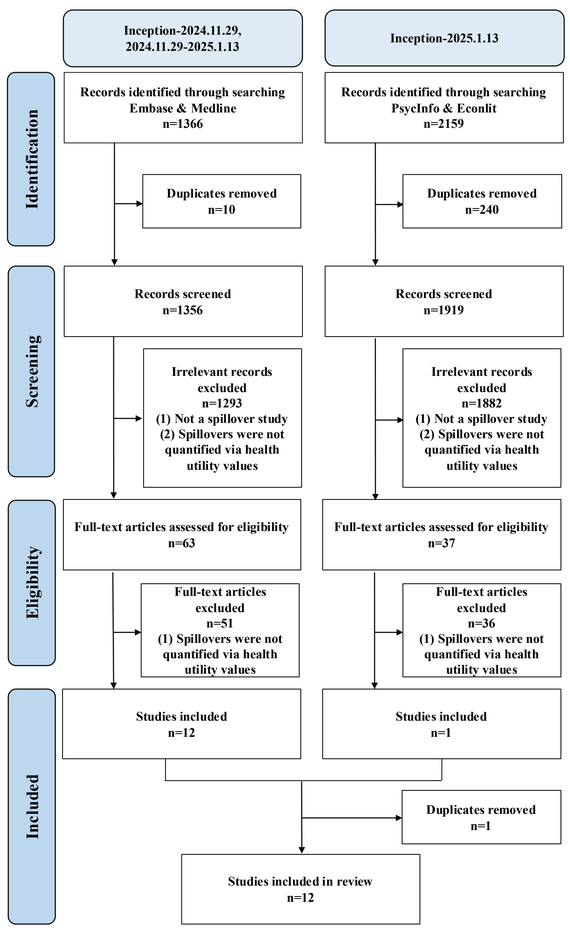


Figure 1 The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow chart

RESULTS

- **Twelve studies** published between 2013 and 2024 were included, primarily from the United States and the United Kingdom.
- The most commonly affected populations were family members and caregivers, particularly parents and spouses.
- Approximately half of the studies focused on specific health conditions, such as mental disorders, autism spectrum disorder, and chronic obstructive pulmonary disease (COPD), while the remainder examined broader or non-specified conditions. (Table 1)

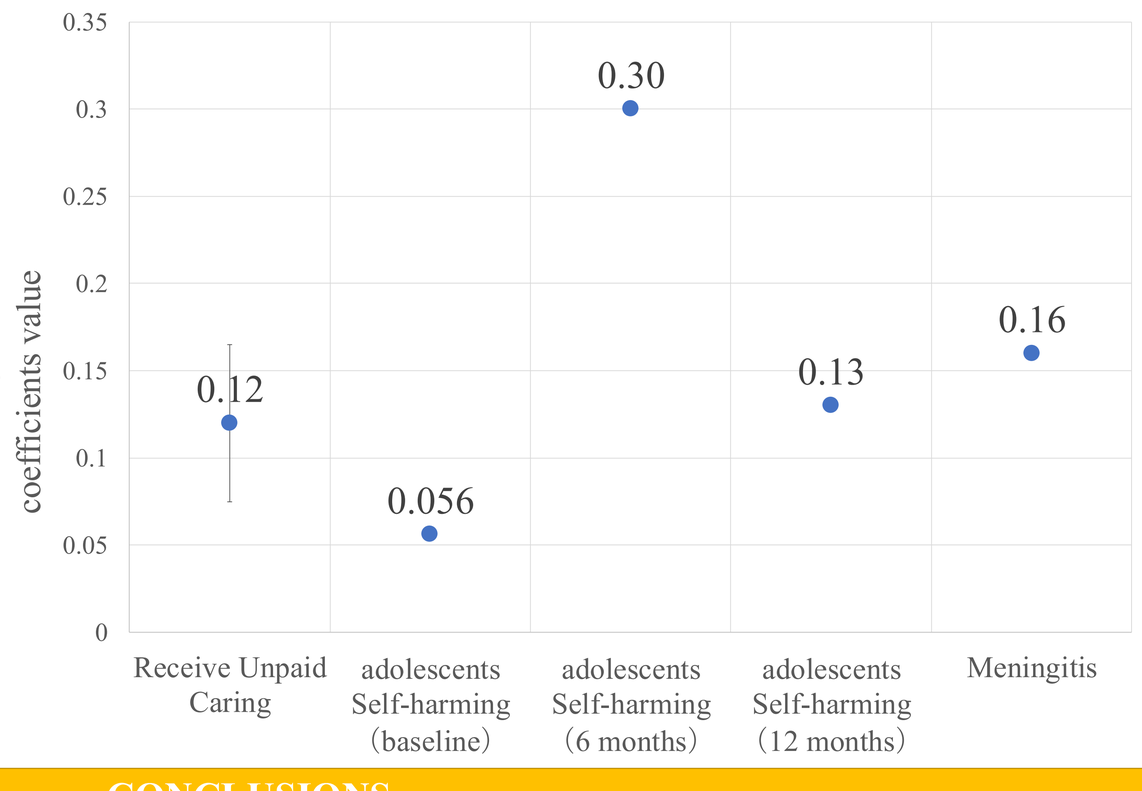
Table 1 Summary of characteristics and spillover conditions of included study

Author, Year	Country	Health conditions of the primary person	Primary person	Sample size	Person(s) affected by spillover	Sample size
Desrosiers (2020)	Sierra Leone	Mental health problems	Patient (adolescents)	140 (intervene)+ 140 (control)	Peer and family caregiver	peers 420+420; caregivers 140+140
Tubeuf (2019)	England	Self-harming [1]	Patient (adolescents aged 11–17 years)	754	Family member (parent)	754
Bhadhuri (2019)	England	Chronic obstructive pulmonary disease (COPD)	Patient	151	Family member	153
Al-Janabi (2016)	UK	Meningitis	Patient	1,218	Family caregiver	1,218
Tilford (2015)	USA	Sleep Problems in Children with Autism Spectrum Disorders (ASD)	Patient (children)	224	Family caregiver	224
Wittenberg (2016)	USA	Opioid misuse	Patient	--	Family member (spouse)	876
Lee (2022)	USA	Mental health disorders [2]	Patient	13,926	Family member	106, 470
Prosser (2015)	USA	chronic illness [3]	Patient	--	Family caregiver (parents, spouses, and other close household members)	The experienced sample: 1,369; The community sample: 1,133
Wittenberg (2013)	USA	Chronic conditions	Patient (adults and children)	24,188	Family member	24,188
Van (2024)	USA	Receive care utilizations (Emergency Department, Inpatient, or Post-acute Care)	Care recipient (veteran)	429	Family caregiver	522
Pennington (2024)	UK	Receive care	Care recipient	About 5,000	Family caregiver	About 5,000
Byrne (2023)	Australia	For all women, especially women with LTHCs (long-term health conditions) [4]	Retired husband	2,660	Family member (wife)	2,660

1. Self-harming, which is defined as any form of non-fatal self-poisoning or self-injury, such as cutting, taking an overdose, hanging, self-strangulation, jumping from a height, and running into traffic, regardless of the motivation or degree of intention to die. This definition would include US definitions of non-suicidal self-injury and suicidal behaviours. 2. Mental health disorders include episodic mood disorder (EMD), anxiety, substance use disorder (SUD), schizophrenia, attention-deficit/hyperactivity disorder (ADHD), and dementia. 3. Chronic illnesses include Alzheimer's disease/dementia, arthritis, cancer, and depression. 4. LTHCs include arthritis, asthma, heart disease, Alzheimer's disease, dementia, stroke, back problems, migraines, and chronic pain, as well as sight, hearing, speech, and mobility problems.

- **Absolute spillover effects**
  - ✓ The results of absolute spillover effects ranged from **−0.26 (disutility) to +0.019**, with two studies reporting marginal positive effects.
- **Relative spillover effects**
  - ✓ Relative spillover effects were estimated through regression models linking changes in the patient's health status (partially measured by utility) to utility shifts in caregivers/family members.
  - ✓ The spillover effect coefficients from the utility of patients to that of caregivers/family members ranged from **0.056 to 0.30** (Figure 2).
  - ✓ Other studies also used alternative indicators such as marginal effects and standard deviations, reporting relative spillover effects that varied by context.

Figure 2 Coefficient values showing the correlation between health utilities



CONCLUSIONS

This review systematically classified spillover effects across diverse health and caregiving contexts and summarized two main measurement approaches. Most identified spillover effects were small but negative, which supports the inclusion of spillover effects in future CUAs, particularly where they improve the accuracy and relevance of economic evaluations.

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