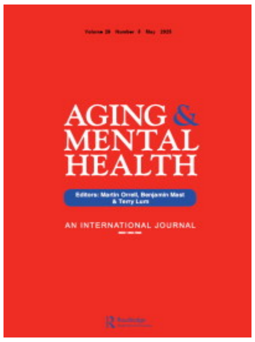

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The impact of unpaid caring on cognitive function: a rapid review

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ABSTRACT

Objectives: Our review aimed to examine the role of unpaid care in influencing cognitive function independently or *via* risk factors for dementia.

Method: This rapid review, registered in PROSPERO and following PRISMA guidelines, searched EMBASE, MEDLINE, and APA PsycINFO databases for longitudinal studies comparing dementia, cognitive function and associated risk factors for dementia between carers and non-carers. Studies were assessed for quality. Data were synthesised narratively.

Results: Five studies looked at cognitive function directly; others examined risk factors: depression, social isolation, physical activity, body-mass index, type 2 diabetes, high blood pressure, educational attainment, and alcohol consumption. Unpaid carers have increased risk of depression and social isolation, and younger carers have lower educational attainment. Studies evaluating the link between unpaid caring and cognitive decline suggest that caring at low and moderate intensities may act as a protective factor against cognitive decline, but not at higher intensities. Female gender and high-intensity caring significantly influence the strength of association between unpaid care and dementia risk factors.

Conclusion: The impact of unpaid caring on cognitive health is complex, influenced by factors like intensity of care and social and cultural context. Across all studies, high-intensity caring negatively impacts carers physical and mental health, which in turn affect their cognitive health.

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KEYWORDS
Unpaid care; caregivers; dementia; cognitive decline; risk factors for dementia

Introduction

Long-term care systems across the world rely heavily on family members and friends as unpaid care providers. The 2021 Census estimated that there are around 5 million unpaid carers in England and Wales, of whom 1.4 million provide 50 h or more of care (ONS & O.f. N.S, 2023), although organisations such as Carers UK believe the numbers to be substantially higher. The number of unpaid carers is projected to increase by more than 45% over the next 20 years (LSE, 2020). Older age groups provide the highest hours of unpaid care per week (ONS & O.f. N.S, 2023), requiring them to balance supporting their partners and managing their own age-related physiological and psychological changes. Unpaid carers play a vital role in supporting individuals with chronic illnesses, disabilities, or age-related conditions, enabling them to remain in their homes and communities for as long as possible. While caring can be a fulfilling experience, there is extensive evidence demonstrating the negative impact of more intense care provision on unpaid carers' physical and mental health, work, finances, leisure time and social relationships (Larkin et al., 2019; Brimblecombe, 2022; Brimblecombe & Burchardt, 2021; Cooper et al., 2007; Kaddour & Kishita, 2020; Daley et al., 2019; Lacey et al., 2019; Spiers et al., 2021; State of Caring 2023, 2023), potentially impacting their cognitive health over time. This is especially the case for people providing more intensive unpaid care. Preventing or reducing the risk of ill-health among carers is an important policy and practice objective in England and part of the legal duties under the 2014 Care Act (Care Act, 2014), the legislation underlying carer policy and practice in England.

In 2024, the Lancet Commission on dementia identified 14 principal modifiable risk factors associated with dementia: low educational attainment, hearing loss, vision loss, traumatic brain injury, hypertension, excess alcohol, obesity, type 2 diabetes, high LDL cholesterol, smoking, depression, social isolation, physical inactivity, and air pollution (Livingston et al., 2024). The Commission also identified three potential risk factors without conclusive evidence: sleep deprivation, poor diet, and other mental health conditions. Cumulative exposures to these modifiable risk factors can increase an individual's likelihood of developing dementia, offering a valuable framework for identifying high-risk populations and informing prevention efforts. Unpaid carers may be particularly vulnerable in this context, as evidence suggests they are more likely than non-carers to experience several of these risk factors. For instance, there is evidence showing that some carers, attain lower educational levels (especially those caring at younger ages), have less cognitively demanding jobs, lower levels of physical activity, less leisure time (Yates et al., 2016), more social isolation, increased risk of depression, sleep deprivation (Shi et al., 2018), poor diet, and increased risk of smoking. Moreover, women are more likely to become unpaid carers (around 70% of unpaid carers on average) and provide more intensive care (Wimo et al., 2023), therefore increasing the underlying sex-related increased risk of dementia that occurs due to longevity and other sex- and gender-related factors (Hasselgren et al., 2020; Podcasy & Epperson, 2016).

Research has extensively examined the physiological, genetic, and lifestyle risk factors associated with dementia. Moreover, there is substantial evidence on the mental and physical health impact of being an unpaid carer. However, relatively less attention has been given to the potential role of

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unpaid care in influencing dementia or cognitive decline, either directly or indirectly through these risk factors (ONS & O.f. N.S, 2023). Thus, it is plausible that an association exists between unpaid caring and dementia cognitive decline or related risk factors. By understanding the relationship between caring and dementia risk, policymakers, health and social care professionals, service commissioners and community organisations can develop targeted interventions and support services to alleviate caring responsibilities and mitigate the potential adverse effects on carers' cognitive health. Moreover, exploring potential differences in dementia risk among subgroups of carers, such as by gender, age, ethnicity, type of caring, and intensity of care, can provide valuable insights for tailoring interventions to address the specific needs of diverse unpaid carer populations.

The aim of this review was to systematically explore existing literature on the impact of unpaid caring on the risk of developing dementia, cognitive decline and on the known risk factors for dementia.

Methods

Search strategy and selection criteria

This rapid review was registered in PROSPERO (CRD42024517929) and followed the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) guidelines. The search of the literature was conducted using electronic databases including EMBASE, MEDLINE, and APA PsycINFO. Grey literature was not included in this review. Our search strategy was developed using a combination of medical subject headings (MeSH) and keywords related to dementia, cognitive function, risk factors, and study designs (Table S1). Search terms included variations and synonyms to ensure a comprehensive retrieval of relevant articles. The search strategy was adapted for each database, taking into account specific indexing terms and syntax requirements.

Studies considered for inclusion in this rapid review were limited to those published in English or Spanish because of the skills available to the research team. To ensure relevance to current policy, we restricted eligibility to articles published from 2010 onward. Included study designs were systematic, scoping and rapid reviews of longitudinal studies, and individual longitudinal studies. By restricting the review to longitudinal study designs, there was the potential to explore the relationship between unpaid caring and cognitive function in a way that. Cross-sectional studies were excluded, as were reviews and studies that were only qualitative or descriptive. All self-identified unpaid carers were included. Studies had to include a non-caring comparator, which was defined as non-caring individuals or within-person non-caring comparison.

The primary outcomes of interest were measures of dementia, cognitive decline and cognitive function, while secondary outcomes included the specified risk factors for dementia: educational level, hypertension, smoking, obesity, type 2 diabetes mellitus, depression, exercise, leisure activities, social isolation, and alcohol drinking. We excluded risk factors that are largely unrelated to the activities of caring, such as hearing loss, vision loss, traumatic brain injury, and air pollution. Satisfaction with leisure activities was included in the search terms as part of social isolation. This is because it is not clear whether the negative effects of social isolation stem from the frequency of contact altogether or from the reduction in satisfaction from social activities. For this reason, we include studies on satisfaction with social leisure activities to encompass the underlying mechanisms behind the social isolation risk factor. These broad inclusion criteria aimed to capture a diverse range of studies that explore the complex interplay between caring responsibilities and cognitive health, as well as the potential moderating effects of various risk factors across different population subgroups, including by age, gender, and ethnicity.

Data extraction

Title and abstracts of studies identified through the search strategy were independently screened by two researchers using Rayyan, a free, web-based platform to assist in the screening and selection of studies for systematic reviews. Discrepancies were resolved through discussion with a third researcher. Full text articles were screened for potentially eligible articles by one researcher and discussed with a second reviewer to reach consensus on inclusion. Eligible longitudinal studies were extracted from the excluded reviews that did not meet the eligibility criteria; systematic reviews were eligible if all included studies met the inclusion criteria, or the results were reported separately. Study characteristics were summarised in Excel as follows: first author, year of publication, setting of the study, sample size, description of study participants (e.g. gender, age, ethnicity, type of carer, type of caring and intensity of care), outcomes included, follow-up time period, subgroup analyses, and results of study.

Quality assessment

Included longitudinal studies were assessed using the Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies and included reviews with the Quality Assessment Tool of Systematic Reviews and Meta-Analyses (National Heart et al., 2021). All quality assessments were completed by one reviewer and then discussed with a second reviewer to reach consensus.

Data synthesis

The evidence was grouped by risk of dementia or dementia risk factors. Characteristics of studies and the evidence on risk of dementia or dementia risk factors were tabulated and summarised in a narrative synthesis.

Results

The methods are detailed below following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (Page et al., 2021) (PRISMA flow diagram; see Figure 1). The initial search found 2,725 studies, of which 1,704 duplicates were removed prior to screening. Title and abstract screening of 1,787 records resulted in 78 studies in the full-text screening. Two longitudinal studies were extracted from excluded reviews and included in this research. Four additional studies were included by manual search. In total, 30 studies were included in the review.

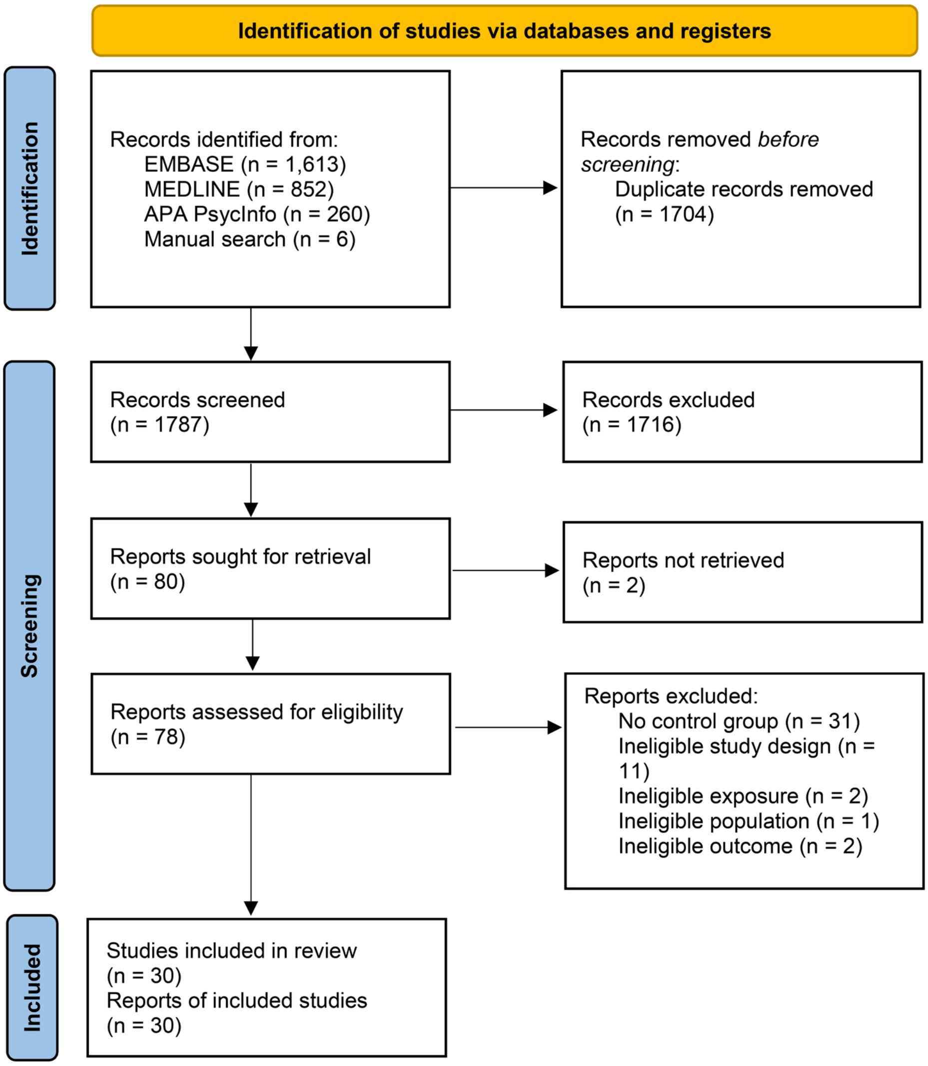

Figure 1. PRISMA flow diagram.

Characteristics of included studies

A summary of characteristics of included studies is shown in Tables 1 and S2. Of the 30 studies, 27 were longitudinal cohort studies (Brimblecombe & Cartagena Farias, 2022; Gallagher & Wetherell, 2020; Hajek & König, 2017; Hajek & König, 2019; Haley et al., 2015; Haley et al., 2020; Hawkley et al., 2020; Hiel et al., 2015; Hurh et al., 2020; King et al., 2023; Lacey et al., 2018; Le & Ibuka, 2023; Longobardo et al., 2023; Mak et al., 2023; Mortensen et al., 2018; Rafnsson et al., 2017; Roth et al., 2018; Strzelecki et al., 2022; von Känel et al., 2011; Xue et al., 2023; Zwar et al., 2018; Zwar et al., 2020; García-Castro et al., 2022; Yuan & Grühn, 2021; Henning et al., 2023; Luo et al., 2019; Su, 2023) and three were systematic reviews of longitudinal studies (Allen et al., 2017; Ervin et al., 2022; Janson et al., 2022). Six of the included studies were published between 2011 and 2017, and 25 since 2018. Eighteen studies focused on European populations, of which nine include UK-specific data and six include German-specific data. Five studies utilised US-specific data and three datasets are from Asian countries – China, Japan, and South Korea.

Twenty-eight studies assessed the role of adult carers and two studies of young carers. Young carers ranged from 16 to 29 years of age. Fourteen longitudinal studies stratified results by gender, nine by some measure of socio-economic status such as employment or education level, and four studies by ethnicity. Women were more likely to be unpaid carers and undertake more intensive caring (Lacey et al., 2018) compared to men. In the included studies, women represent around 50%–70% of unpaid carers, ranging from 35% (Le & Ibuka, 2023) to 91% (Strzelecki et al., 2022). Carers reported more health problems than non-carers at baseline (von Känel et al., 2011), and women had higher levels of depressive symptoms than men at baseline (Gallagher & Wetherell, 2020; Hawkley et al., 2020; Hurh et al., 2020). Most studies used a dichotomous independent variable based on self-identification as an unpaid carer or not. Eleven studies differentiated outcomes based on intensity of caring by number of hours (Brimblecombe & Cartagena Farias, 2022; King et al., 2023; Lacey et al., 2018; Mak et al., 2023; Mortensen et al., 2018; Roth et al., 2018; Xue et al., 2023; Su, 2023), co-residence status (Brimblecombe & Cartagena Farias, 2022; Gallagher & Wetherell, 2020; Le & Ibuka, 2023; Roth et al., 2018; Xue et al., 2023), or duration of care (King et al., 2023; Le & Ibuka, 2023; von Känel et al., 2011; Xue et al., 2023).

No studies were found that assess the association between unpaid caring and dementia diagnosis. Five longitudinal studies (García-Castro et al., 2022; Yuan & Grühn, 2021; Henning et al., 2023; Luo et al., 2019; Su, 2023) and one systematic review measured the impact of unpaid caring on cognitive function directly (Allen et al., 2017). Sixteen studies examined the association between unpaid caring and depression (Gallagher & Wetherell, 2020; Haley et al., 2015; Haley et al., 2020; Hawkley et al., 2020;

Table 1 - Characteristics of included studies.

Study	Setting	Dataset	Sample size	Risk factors	Results
Brimblecombe and Cartagena Farias (2022)	United Kingdom	UKHLS	2349 carers/23,586 non carers	Employment status; Social support	Caring for $\geq$10 h a week were associated with lower odds of being in paid employment; poorer mental and physical health; and higher odds of loneliness and social isolation compared to non-caring. Being a female carer was associated with worse outcomes. Unpaid carers of $\geq$10 h a week with lower qualifications are 6 times less likely to be in paid employment, significantly lower mental and physical health scores.
Gallagher and Wetherell (2020)	United Kingdom	UKHLS COVID-19 Dataset	1349 carers/6178 non-carers	Depression; loneliness	Caregivers had a 21% greater risk of being depressed compared with non-caregivers (OR 1.22; 95% CI (1.05, 1.40), $p = 0.008$). Carers who felt lonelier during COVID-19 had increased odds of depression (OR 3.85; 95% CI (3.08, 4.85), $p < 0.001$).
Hajek and König (2017)	Germany	DEAS	3026 carers/17,824 non-carers	BMI	The onset of informal caring was not associated with changes in BMI in the total sample and in women, whereas the onset of informal caring was associated with an increase in BMI in men ($\beta = 0.15$, $p < 0.05$).
Hajek and König (2019)	Germany	DEAS	3155 carers/18,607 non-carer	Social network size; loneliness; leisure time satisfaction.	Changes in informal caregiving were positively associated with network size ($\beta = 0.27$, $p < 0.001$) and in men ($\beta = 0.38$, $p < 0.01$) and negatively associated with changes in satisfaction with leisure-time activities in the total sample ($\beta = -0.11$, $p < 0.001$) and in both sexes (men: $\beta = -0.08$, $p < 0.05$; women: $\beta = -0.13$, $p < 0.001$). Fixed effect regressions revealed that informal caring did not affect loneliness.
Haley et al. (2015)	United States	REGARDS	235 carers/235 non-carers	Depression; leisure time satisfaction	Carers had significantly higher depression scores at 9 months compared to non-caregivers (0.28 SDUs). This difference diminished over time, decreasing to 0.01 SDUs at 36 months. Being a non-carer, older, white, and having fewer health problems were associated with higher leisure time satisfaction.
Haley et al. (2020)	United States	CTS, REGARDS	251 carers/251 non-carers	Depression	Caregivers showed significantly greater increases over time in depressive symptoms compared to non-carers with effect size (d) after adjustment of 0.676. Transition to caregiving was associated with RR 2.91 of depressive symptoms compared with non-carers.
Hawkley et al. (2020)	United States	NSHAP	83 carers/897 non-carers	Depression; loneliness; social support	Associations between caregiving and depressive symptoms were not significant for caring wives, regardless of their husbands' MoCA-SA scores. A negative association between caring and depressive symptoms for caring husbands was large but not statistically significant ($\beta = -0.354$, $p < 0.1$). No associations were observed between caregiving and loneliness, social engagement, and social support.
Hiel et al. (2015)	Europe	SHARE	997 carers/6861 non-carers	Depression; Physical activity.	Caring was associated with poor exercising behaviour (OR 1.25, 95% CI (1.09, 1.45)), and self-rated and mental health (OR 1.18, 95% CI (1.01, 1.38). Depression scores were greater for carers at both waves (31.1% and 28.8% vs. 20.3% and 19.7% respectively).

(Continued)

Table 1 Continued.

Study	*Setting*	*Dataset*	*Sample size*	*Risk factors*	*Results*
Hurh et al. (2020)	*South Korea*	*KLoSA*	*318 carers/7499 non-carers*	*Depression*	*Women unpaid carers showed more depressive symptoms (β 0.76, p < 0.001) than non-carers but not men (β 0.33, p = 0.07). After stopping family caring, neither men (β – 0.09, p = 0.59) nor women (β 0.24, p = 0.06) showed differences in depressive symptoms compared to non-carers. Men who were 75+ years old (β 0.97, p = 0.005), lived in urban areas (β 0.65, p = 0.04), were economically inactive (β 0.54, p = 0.04), and lived alone (β 2.07, p = 0.009) showed higher risk of depressive symptoms. Women who were aged 65–74 years (β 1.14, p < 0.001), lived in urban areas (β 0.82, p < 0.001), were economically active (β 1.20, p < 0.001), and lived alone (β 1.30, p = 0.05), showed more depressive symptoms compared to non-carers.*
King et al. (2023)	*United Kingdom Germany*	*UKHLS and the German Socio- Economic Panel*	*UK: 4185 carers/21,671 non-carers Germany: 741 carers/15,925 non-carers*	*Educational attainment; Employment.*	*Carers in the UK had a 152% lower chance of achieving higher education and 90% in Germany compared to non-carers. Carers 24+ years old had 11% lower likelihood of employment in the UK and 21% in Germany. Women in Germany experienced a stronger negative impact from youth caring, no gender differences were observed in the UK.*
Lacey et al. (2018)	*United Kingdom*	*UKHLS*	*1282 carers/8139 non-carers*	*BMI; waist circumference.*	*Women carers had higher adiposity than women non carers (BMI: 1.27, 95% CI (0.75, 1.79); waist circumference: 2.92, 95% CI (1.82, 4.02); body fat: 1.90, 95% CI (1.21, 2.58). Caregiving was associated with particularly high BMI, waist and percentage body fat for younger women (aged 16–44). No significant association in men. The associations by intensity of caring were not significant upon the inclusion of age.*
Le and Ibuka (2023)	*Japan*	*JSTAR*	*461 carers/3905 non-carers*	*Depression; social support; leisure time*	*Unpaid carers had a higher percentage of poor depressive symptoms, particularly strong for females. Unpaid carers perceived less social support (difference of 17.4%) compared to non-carers. Carers spent less time participating in community and religious meetings and sleep by approximately 0.31 and 0.23 SD, respectively, compared to non-carers.*
Longobardo et al. (2023)	*Europe*	*SHARE*	*21,006 carers/74,914 non-carers*	*Depression; sleep; cardiometabolic health and type 2 diabetes.*	*Unpaid carers had greater probability of feeling depressed (by 11.6% if co-resident and 4.5% if extra-resident) and having sleeping problems (by 12.8%). Short-term effects persisted for depression and intensified for sleeping problems. Southern and Eastern Europe had higher probabilities of depression by 9% and 3.9% respectively. Carers in countries with low expenditure on long-term care have a 7.9% higher probability of depression. No significant effect for heart attack and type 2 diabetes.*
Mak et al. (2023)	*United Kingdom*	*UK COVID-19 Social Study*	*2520 carer observations/7,894 non-carer observations*	*Depression; loneliness*	*Carers had more depressive symptoms than non-carers during various lockdown phases. The strongest impact was observed when all restrictions were lifted in July 2021 (ATT 1.01, 95% CI (0.44, 1.59)). No association found between caring responsibilities and levels of loneliness at any time point.*

(*Continued*)

Table 1 Continued.

Study	*Setting*	*Dataset*	*Sample size*	*Risk factors*	*Results*
Mortensen et al. (2018)	*United KingdomSweden, France*	*GAZEL (France); SLOSH (Sweden), Whitehall II study (UK)*	*3411 carers/17,832 non-carers*	*Type 2 Diabetes (T2D)*	*Informal caregiving was not associated with odds of T2D (OR 1.09, 95% CI (0.92, 1.30). Low social support at work was associated with higher T2D risk (OR 1.18, 95% CI (1.02, 1.37).*
Rafnsson et al. (2017)	*United Kingdom*	*ELSA*	*918 carers/5,653 non-carers*	*Depression*	*Entry into spousal/child caregiving linked to significant improvement in life satisfaction (β 1.02, $p < 0.01$) and depression levels ($\beta - 0.26$, $p < 0.05$). Upon exiting, both spousal/child and non-spousal/child caregivers experienced a significant increase in depression levels over time compared to non-carers ($\beta = 0.44$, $p < 0.01$; $\beta = 0.25$, $p < 0.05$).*
Roth et al. (2018)	*Europe*	*REGARDS*	*3580 carers/3580 non-carers*	*Depression*	*Statistically significant interaction effects between caring status and depressive symptoms (Chi^2 ($df = 1$) 5.258, $p = 0.023$).*
Strzelecki et al. (2022)	*United States*	*University of Kentucky Center for Clinical and Translational Science and social media platforms.*	*148 carers/172 non-carers*	*Depression; alcohol consumption.*	*Mean alcohol consumption increased significantly during COVID relative to pre-COVID levels in caregivers (t(109) 3.01, $p = 0.003$), but not in non-carers ($p = 0.48$). Depressive symptoms increased during COVID relative to pre-COVID levels for all subjects (F(1,294) 15.36, $p < 0.001$]. There was no main effect of carer status on depressive symptoms ($p = 0.38$). Changes in alcohol consumption were significantly and positively associated with changes in sleep quality and insomnia for caregivers but not for non-carers. Increases in depression were associated with decreases in sleep quality and increases in insomnia for both caregivers and non-carers ($p < 0.001$).*
von Känel et al. (2011)	*United States*	*University of California San Diego Alzheimer's Caregiver Study*	*119 carers/55 non-carers*	*Waist circumference; high blood pressure; fasting glucose.*	*Caregiving was not a significant predictor of elevated waist circumference, high blood pressure and glucose levels (all p-values > 0.27).*
Xue et al. (2023)	*United Kingdom*	*UKHLS*	*4479 carers/22,730 non-carers*	*Educational attainment; Employment.*	*Carers were 38% less likely to achieve a higher education (university) degree qualification than non-carers (HR 0.62; 95% CI (0.47, 0.82). The likelihood of obtaining a university degree qualification decreased with the increasing number of hours caring per week. Caring for grandparents was less associated with achieving a university degree than caring for parents or others. Intensive care may influence unemployment, with those caring for 20 h + per week 42%–80% more likely to enter unemployment than non-carers. No difference by gender or socio-economic factors.*
Zwar et al. (2018)	*Germany*	*DEAS*	*14,039–16,412 observations*	*Depression*	*Helping around the house and looking after someone significantly increased depressive symptoms (0.64 increase, $p = 0.02$; 0.72 increase, $p < 0.001$ respectively).*
Zwar et al. (2020)	*Germany*	*DEAS*	*547 carers*	*Depression; social isolation; loneliness; network size.*	*Significant association between transitioning into caring and increased depressive symptoms (β 0.63, $p < 0.05$), driven by male carers (β 0.93, $p < 0.01$). The association between transitioning into caring and social isolation (β 0.01, $p = 0.610$) and loneliness (β 0.03, $p = 0.145$) were not significant overall but were significant for male carers (β 0.06, $p < 0.05$). However, the association with network size was significant (β 0.35, $p < 0.05$), specifically for male carers (β 0.43, $p < 0.05$).*

(Continued)

Table 1 Continued.

Study	Setting	Dataset	Sample size	Risk factors	Results
García-Castro et al. (2022)	*United Kingdom*	*ELSA*	*3356 carers/3888 non-carers*	*Cognitive decline*	*Caregivers had higher scores immediate and delayed recall tasks, and verbal fluency task, but not in serial 7 task (processing speed).*
Yuan and Grühn (2021)	*United Kingdom*	*ELSA*	*2862 carers/9237 non-carers*	*Cognitive decline*	*Concurrent effects: Caring in the current wave was related to better delayed recall ($B = 0.12$, $p < .01$) and better verbal fluency ($B = 0.25$, $p < .05$). Immediate recall was not significant ($B = 0.05$, $p = .07$).* *Lagged effects: Caring in one wave was related to better delayed recall in the next two waves than noncarers; caring in one wave was related to better immediate recall in the next wave but caring for two waves was related to worse immediate recall in the next wave. Cumulative effects were nonsignificant and rather small.*
Henning et al. (2023)	*Germany*	*German Ageing Survey*	*294 carers/6358 non-carers*	*Cognitive decline; social isolation*	*No significant associations were found.*
Luo et al. (2019)	*China*	*China Health and Retirement Longitudinal Study*	*13,596 participants*	*Cognitive decline*	*Those who cared for their grandchildren ($b = 0.064$), those who cared for their spouse ($b = 0.122$) and those who provided informal help ($b = 0.109$) had a smaller decline in mental status score over a two-year period than those who did not engage in these activities. Note that there is no indication of how many hours signify "caring" reported in the research.*
Su (2023)	*China*	*China Health and Retirement Longitudinal Study*	*13,599 carers/10,549 non-carers*	*Cognitive decline*	*Positive association between caregiving and cognitive functioning ($\beta = 0.249$, $p < .001$). Considering caregiving intensity, the positive association was only found in low ($\beta = 0.335$, $p < .001$) and moderate-intensity caregivers ($\beta = 0.250$, $p < .05$) but not in high-intensity caregivers.*
Allen et al. (2017)	*Global (SR)*	*Varied*	*Varied*	*Cognitive health; blood pressure; BMI*	*Spousal carers cognitive performance declining as much as 4.5 times faster than non-carers over 2 years. Recall was worsened in carers in short-term. Mixed evidence concerning differences between carers and non-carers systolic/diastolic blood pressure. Carers did not differ significantly in BMI. Males had higher BMI at baseline and follow-up.*
Ervin et al. (2022)	*OECD countries (SR)*	*Varied*	*133,426 participants*	*Depression*	*All thirteen included studies were longitudinal and were from high-income OECD countries. 11 studies reported a negative longitudinal association between informal unpaid care and depression. Only two studies reported no association between informal unpaid caregiving and mental health.*
Janson et al. (2022)	*Global (SR)*	*Varied*	*Varied*	*Depression*	*Informal carers were more likely to develop mental and behavioural disorders compared with non-carers, especially severe stress and adjustment disorders (OR 1.61) and depression (OR 1.38).*

DEAS: Ageing Survey ('Deutscher Alterssurvey'. REGARDS: Reasons for Geographic and Racial Differences in Stroke. CTS: Caregiving Transitions Study. NSHAP: National Social Life, Health and Aging Project. SHARE: Survey of Health, Ageing and Retirement in Europe. KLoSA: Korea Longitudinal Study of Aging. JSTAR: Japanese Study of Aging and Retirement. ELSA: English Longitudinal Study of Ageing. SR: systematic review. SLOSH: Swedish Longitudinal Occupational Survey of Health.

Hiel et al., 2015; Hurh et al., 2020Le and Ibuka, 2023; Longobardo et al., 2023; Mak et al., 2023Rafnsson et al., 2017; Roth et al., 2018; Strzelecki et al., 2022Zwar et al., 2018; Zwar et al., 2020; Ervin et al., 2022; Janson et al., 2022), eight between social outcomes (Brimblecombe & Cartagena Farias, 2022; Gallagher & Wetherell, 2020; Hajek & König, 2019; Haley et al., 2020; Hawkley et al., 2020; Le & Ibuka, 2023; Mak et al., 2023; Zwar et al., 2020), seven physical health *via* the specific risk factors of physical activity (PA) (Hiel et al., 2015), body-mass index (BMI) (Hajek & König, 2017; Lacey et al., 2018; von Känel et al., 2011; Allen et al., 2017), type 2 diabetes (Longobardo et al., 2023; Mortensen et al., 2018), and cardiovascular measures (Longobardo et al., 2023; von Känel et al., 2011; Allen et al., 2017), two on educational status and employment (King et al., 2023; Xue et al., 2023), and one related to alcohol consumption (Strzelecki et al., 2022).

Quality assessment

Full details of the risk of bias assessment for both longitudinal cohort studies and systematic reviews are shown in Table S3. The overall quality of evidence was high. Only one of the studies was found to have lower quality (Strzelecki et al., 2022) due to its retrospective survey design. Few of the studies specified the participation rate of eligible persons in the data collection, mostly because these studies analysed existing large multi-year datasets. Additionally, most studies measured self-reported outcomes, except in the case of two studies where a nurse measured BMI (Lacey et al., 2018) and cardiovascular health (von Känel et al., 2011). None of the systematic reviews reported on publication bias. Since the included reviews were not meta-analyses, quantitative assessment of heterogeneity was not applicable.

Direct relationship between unpaid caring and cognitive decline

The systematic review by Allen et al. (Allen et al., 2017) evaluated the association between caring and cognitive decline. The study identified that spousal carers' cognitive performance declined 4.5 times faster than non-carers over 2 years (Allen et al., 2017). The primary studies included used the digit symbols tests, which measures information processing speed, concentration, and attention (Allen et al., 2017). The review highlighted that, while existing research on cognition in unpaid carers has primarily addressed memory, attention, and executive function, there remains a significant gap in exploring the nuances of complex cognition in this population (Allen et al., 2017). Complex cognition typically refers to higher-order cognitive processes such as problem-solving, decision-making, reasoning, and cognitive flexibility. In the context of carers, complex cognition may encompass the ability to manage multiple tasks simultaneously, adapt to changing situations, and navigate complex social dynamics.

Five longitudinal studies analysed three datasets from England, China, and Germany to evaluate the direct impact of caring on cognitive decline. These studies often found that, when examining the overall sample of carers, they demonstrated better cognitive function than non-carers (García-Castro et al., 2022; Yuan & Grühn, 2021; Henning et al., 2023; Luo et al., 2019; Su, 2023). Grandchild care ($B = 0.064$, $p < 0.1$), spousal care ($B = 0.122$, $p < 0.01$), and informal help ($B = 0.109$, $p < 0.05$) were linked to less cognitive decline over two years (Luo et al., 2019). Caring was also associated with better delayed recall ($B = 0.12$, $p < 0.01$) and verbal fluency ($B = 0.25$, $p < 0.05$) than for non-carers (Yuan & Grühn, 2021). A fourth study found a positive link between caregiving and cognitive function for low ($\beta = 0.335$, $p < 0.001$) and moderate-intensity ($\beta = 0.250$, $p < 0.05$) caregiving, but not for higher intensity caregiving (Su, 2023). These findings collectively suggest that caregiving at lower intensities may have a protective effect on cognitive function, but not at high intensity.

Relationship between unpaid caring and dementia risk factors

Relationship between unpaid caring and depression

Fifteen out of 16 studies looking at the relationship between depression and unpaid care found a significant relationship between the transition into unpaid caring and the increased number and intensity of depressive symptoms among carers. All studies used standard validated measures of depressive symptoms. Ten longitudinal studies used the Center for Epidemiologic Studies Depression Scale (CES-D), two studies used European-Depression (EURO-D) scale (Hiel et al., 2015; Longobardo et al., 2023), one used a 12-item General Health Questionnaire for Depression (Gallagher & Wetherell, 2020) and one the Patient Health Questionnaire (Mak et al., 2023).

Being overwhelmed from managing caring responsibilities alongside other responsibilities, such as work, relationships, and self-care, and confronting the mortality of the care recipient, can contribute to depression (Ervin et al., 2022). Multiple studies note that the onset of unpaid caring led to a significant increase in depressive symptoms across all carer types and that increase was sustained over time (Gallagher & Wetherell, 2020; Hurh et al., 2020; Le & Ibuka, 2023; Longobardo et al., 2023; Mak et al., 2023Zwar et al., 2018; Zwar et al., 2020; Ervin et al., 2022; Janson et al., 2022), even if they exited caring (Rafnsson et al., 2017). In these studies, odds ratios (OR) ranged from 1.22 (Gallagher & Wetherell, 2020) to 1.38 (Janson et al., 2022) and beta coefficients from 0.63 (Zwar et al., 2020) to 1.091 (Hurh et al., 2020). However, two studies found that, although carers experience higher depressive symptoms in the short term, the significance diminished over time (Haley et al., 2015; Roth et al., 2018). Only one study (Hawkley et al., 2020) found no significant association between unpaid caring and depressive symptoms at any point over a 5-year follow-up.

Studies found that high-intensity unpaid caring tripled the risk of clinically significant depressive symptoms (Haley et al., 2020). The effects were more pronounced for women than men (Hurh et al., 2020; Le & Ibuka, 2023; Ervin et al., 2022) and for younger adult carers (Haley et al., 2020). For instance, the study by Hurh et al. (Hurh et al., 2020) found that women who had become carers exhibited significantly more depressive symptoms (β 0.761, $p < 0.001$) than non-carers; however, the significance disappeared among men (β 0.330, $p = 0.069$) (Hurh et al., 2020). Regarding age disparities, the difference in magnitude of depressive symptoms between younger adult carers (mean age 64 years) and their non-carer counterparts was twice as large as the difference between older adult carers (mean age 80 years) and their respective controls (Haley et al., 2020).

Relationship between unpaid caring and social isolation

Social isolation refers to the subjective experience of feeling disconnected from or excluded from society (Zwar et al., 2020). Measuring social isolation involves capturing the intricate interplay of social connections, participation, and subjective experiences. Measures include social network analysis, frequency and type of social contact, participation and satisfaction in social activities, and self-reported feelings of loneliness. Although loneliness and satisfaction from leisure activities are distinct concepts, they both contribute to a more comprehensive understanding of social isolation and are therefore included in this study.

Studies measuring the relationship between unpaid caring and social isolation outcomes exposed mixed results depending on the measure and intensity of caring used. The studies that measured loneliness, representing one facet of social isolation, without stratifying by intensity of caring found no association between unpaid care and loneliness (Hawkley et al., 2020; Mak et al., 2023; Zwar et al., 2020). Loneliness scales assessed two distinct dimensions: emotional loneliness, arising from the lack of intimate connections or close emotional bonds (e.g. a partner or best friend), and social loneliness, stemming from the absence of a wider social network (e.g. friends, colleagues, and community) (Gierveld & Tilburg, 2006). Studies that measured network size found that onset of unpaid caring was linked to an initial increase in carers' social network size (Hajek & König, 2019; Zwar et al., 2020). Network size is measured by the number of important individuals with whom the participant is in regular contact (Zwar et al., 2020).

Upon further examination, the intensity of caring appears to play a crucial role in determining social outcomes. Brimblecombe and Cartagena Farias (2022) examined social outcomes based on the intensity of caring, and revealed that high-intensity carers, typically devoting over 10 h per week to caring duties, exhibited higher odds of experiencing loneliness and social isolation (Brimblecombe & Cartagena Farias, 2022). This phenomenon may be attributed to the significant time and energy demands placed on high-intensity carers, potentially limiting their ability to maintain pre-existing social connections or cultivate new ones.

Moreover, research has explored the mediating role of loneliness in the relationship between informal caring and various health outcomes. For instance, Mortensen et al. (2018) found that unpaid carers with low social support at work faced an increased risk of type 2 diabetes compared with what would be expected for each exposure on its own (caring and low social support at work), suggesting that loneliness may serve as a mediator in this association (Mortensen et al., 2018). Similarly, Gallagher and Wetherell (2020) reported that unpaid carers were at greater risk of depression during the COVID-19 pandemic (OR 1.22, 95% CI (1.05, 1.40), $p = 0.008$), and this heightened risk could largely be explained by feelings of loneliness (OR 3.85, 95% CI (3.08, 4.85), $p < 0.001$) (Gallagher & Wetherell, 2020).

Furthermore, the relationship between unpaid caring, social engagement, and satisfaction from social engagement is complex, with studies revealing varying degrees of impact on carers' ability to engage in and derive satisfaction from social leisure activities. Evidence suggests that carers tend to allocate less time to leisure activities compared to non-carers (Le & Ibuka, 2023). Specifically, unpaid carers participated less than non-carers in community and religious meetings (Le & Ibuka, 2023). Moreover, carers often reported significantly lower levels of satisfaction with their leisure activities (Hajek & König, 2019; Haley et al., 2015) that persisted over time (Haley et al., 2015). The temporal, emotional, and physical demands of caring may create long-term problems with carers' capacity to participate in and enjoy valued activities and interests (Haley et al., 2015). However, the studies conducted in the UK reported no significant relationship between caring and satisfaction from leisure activities (Mak et al., 2023; Rafnsson et al., 2017), suggesting cultural differences in caring norms and leisure preferences.

Relationship between unpaid caring and physical activity, body-mass index, high blood pressure, type 2 diabetes, and cholesterol levels

Included studies found no significant association between unpaid caring and type 2 diabetes (Longobardo et al., 2023; Mortensen et al., 2018) or BMI (Hajek & König, 2017; Lacey et al., 2018; von Känel et al., 2011; Allen et al., 2017). Hajek and König (2017) stratified results by gender and found that the onset of informal caregiving was not associated with changes in BMI in the total sample or in women, but it was associated with an increase in BMI for men. However, studies found that the effect that unpaid caring has on BMI decreases when controlling for confounding variables, as BMI is positively associated with ageing and stress, specifically for men (Hajek & König, 2017; Lacey et al., 2018). Other studies found a positive association between unpaid caring and BMI in women who combine caring with full-time employment. For instance, women aged 16–44 years combining full-time work with caring had BMIs which were more than 2 points higher than non-carers (SMD 2.07, 95% CI (0.16, 3.99)) and women aged 65 or over had BMIs 7 points higher (SMD 7.06, 95% CI (3.38, 10.74)) than non-carers (Lacey et al., 2018).

Allen et al. (2017) found mixed evidence concerning differences between carers and non-carers in systolic blood pressure (Allen et al., 2017). von Känel et al. (2011) reported that, while spousal carers had more total cardiometabolic risks at baseline than non-carers ($p = 0.011$), there was no significant difference in each individual risk factor ($p = 0.224$), such as high blood pressure or cholesterol levels (von Känel et al., 2011). These discrepancies may stem from variations in study populations, methodologies, and the specific aspects of caring examined.

Relationship between unpaid caring and alcohol consumption

The study by Strzelecki et al. (2022) examined alcohol consumption and its association with sleep, comparing unpaid carers versus non carers pre- and post-COVID-19. The findings showed that changes in alcohol consumption were significantly associated with changes in sleep quality and insomnia for unpaid carers. By contrast, no significant association was found for non-carers (Strzelecki et al., 2022).

Relationship between unpaid caring and educational attainment

Unpaid caring can have significant implications for educational attainment and employment opportunities, particularly among young carers. Studies in the UK and Germany examined the relationship between caring intensity and educational outcomes (King et al., 2023; Xue et al., 2023). These studies categorised caring intensity as no care, regular care (less than 10 h/week), and intensive care (10 h/week or more). Xue et al. (2023) showed that younger carers were 38% less likely to achieve a higher education degree compared to non-carers (hazard ratio (HR) 0.62, 95% CI (0.47, 0.82)) (Xue et al., 2023). Both studies suggested that young carers' educational attainment is negatively associated with hours of care (King et al., 2023; Xue et al., 2023). Also, after full-time education age (among the age 23+ group), unpaid carers were less likely to enter employment even after adjusting for educational qualifications (King et al., 2023; Xue et al., 2023), and higher-intensity carers were 46%–58% less likely to enter employment than non-carers (King et al., 2023; Xue et al., 2023). Interestingly, gender differences were only found in the German population, where the effects were significantly stronger for women (OR 1.14; 95% CI (1.02, 1.28)) than for men (King et al., 2023).

Discussion

This rapid review aimed to synthesise existing evidence on the risk of dementia, cognitive decline, or increased prevalence of risk factors for dementia in unpaid carers compared to non-carers. Five longitudinal studies and one systematic review directly examined the impact of unpaid caring on cognitive decline. The systematic review found that unpaid carers experience greater cognitive decline compared to non-carers (Allen et al., 2017). In contrast longitudinal studies suggest that the intensity of caring plays a key role, with carers having less cognitive decline compared to non-carers at lower levels of caregiving intensity (García-Castro et al., 2022; Yuan & Grühn, 2021; Henning et al., 2023; Luo et al., 2019; Su, 2023). The studies that evaluate the relationship between the risk factors of dementia and caring point towards an increased risk of dementia for carers compared to non-carers.

This seemingly paradoxical finding could be explained by the concept of 'cognitive reserve'. The daily demands of caring, which often involve complex problem-solving, scheduling, and emotional regulation, may provide a form of mental exercise that helps maintain and even enhance cognitive abilities. As García-Castro et al. (2022) suggest, caring acts as a form of *activity engagement* that contributes to cognitive reserve and potentially protects against future decline (García-Castro et al., 2022). It could also be influenced by the heterogeneity within the broad category of carers. Our review encompasses a wide range of caring experiences, varying in type (child, spouse, other), intensity, and duration. It is plausible that different caring profiles have different impacts on cognitive health. While moderate levels of caring, such as providing support to an ageing parent, might offer cognitive benefits, intensive, long-term caring, like that provided by spousal carers, could potentially have detrimental effects.

We found that the strongest evidence on risk factors for dementia for unpaid carers related to depression and social isolation. While the literature indicates a heightened risk of depression among unpaid carers, the relationship is influenced by various factors, including individual differences, caring contexts, hours of caring, and coping mechanisms, highlighting the need for personalised interventions and support services to promote the mental well-being of carers. This is especially important for unpaid carers at risk of developing more severe depressive symptoms, and/or persistent or recurrent depression, as they may have a greater likelihood of developing dementia compared to those with less severe or transient depressive symptoms (White et al., 2015). Furthermore, there is emerging evidence suggesting that the severity of depression may influence the progression of dementia once it has developed (Weisenbach et al., 2012). While caring has been shown to be linked to poorer mental health, this study suggests that the consequences may be broader than previously assumed, exacerbating cognitive decline in those with severe mental illness. Nevertheless, there is some evidence suggesting that unpaid carers who perceive their role as meaningful and rewarding may experience a sense of fulfilment and purpose, which can serve as a protective factor against depression (Hiel et al., 2015; Mak et al., 2023).

Social isolation has been well-studied as a risk factor for cognitive decline. When looking at social isolation in unpaid carers, our review found mixed results. Social isolation might be part of a complex interaction between other risk factors of cognitive decline, particularly depression (Gallagher & Wetherell, 2020). The study by Gallagher et al. (Gallagher & Wetherell, 2020) showed that almost 80% of carers who reported being lonely 'sometimes' were depressed and 90% of carers who were not depressed reported 'never' being lonely. Those who felt lonelier during COVID-19 had an almost four-fold risk of depression. These findings are consistent with other studies where, in combined models, the strength of the association between depressive symptoms and the subsequent risk of dementia decreased, and the association with social integration disappeared (Heser et al., 2014). Furthermore, a recent analysis of the UK Biobank evaluating the relationship between social isolation, loneliness, genetic risk of dementia, and dementia (with no analysis of caring) suggests that it is difficult to establish causality from social isolation to cognitive decline in later life. Preclinical changes in cognitive health may influence social activity as much as or more than social activity influences cognitive health, adding further complexity to analyses on social isolation (Elovainio et al., 2022).

Social engagement may motivate an individuals' participation in physical and leisure activities and other healthy behaviours. This review suggests that beyond the frequency of social engagement, satisfaction from social leisure activities may be an important factor in carers' mental health, and potentially cognitive health. Engagement in leisure activities has been positively associated with various aspects of well-being in late adulthood, including cognitive function, physical function, and mental health (Sala et al., 2019). Research indicates that participation in leisure activities can serve as a protective factor against ageing-related decline, offering cognitive stimulation, social interaction, and emotional fulfilment (Jopp & Hertzog, 2007; Gow et al., 2017; Karp et al., 2006). However, unpaid caring responsibilities can significantly impact carers' abilities to engage in social and leisure activities (Karp et al., 2006), potentially diminishing the protective effects they offer against cognitive decline and other age-related challenges. Importantly, our findings highlight the importance of cultural context in connecting unpaid caring, leisure satisfaction, and thereby, the potential impact on cognitive health due to different results by socio-demographic factors, including geography. Additionally, cultural attitudes toward ageing, familial expectations and roles, and community support structures can influence carers' perceptions of the importance of self-care and social and leisure time amidst their caring duties (Su, 2023), potentially affecting their overall well-being and quality of life.

Although the Lancet Commission on dementia highlights sleep deprivation only as a *potential* risk factor (Livingston et al., 2024), sleep measures were evaluated in four of the included studies, specifically as they relate to depression (Longobardo et al., 2023; Strzelecki et al., 2022; von Känel et al., 2011; Janson et al., 2022). The relationship between sleep and dementia is complex, with literature suggesting bidirectional and indirect influences through other risk factors. For instance, inadequate sleep has been linked to an increased risk of depression (Peng & Chang, 2013; Sacco et al., 2018), compromised cardiovascular health (Peng & Chang, 2013), alcohol consumption (Ebrahim et al., 2013), reduced energy levels impacting participation in physical and leisure activities, and disruptions in dietary habits and increased BMI. Conversely, these factors also influence the duration and quality of sleep, with evidence showing that depression and alcohol consumption can disrupt sleep patterns (Strzelecki et al., 2022; Sacco et al., 2018), while cardiovascular issues like sleep apnoea can directly interfere with sleep quality (von Känel et al., 2011). Also, it is important to consider that sleep disturbances emerging in later life may be attributed to ageing, and worsen with each year (Peng & Chang, 2013), and/

or the natural progression of dementia. Sleep disturbance has been hypothesised to contribute to inflammation and accumulating sleep debt over time has been associated with quicker cortical thinning and lower clearance of beta-amyloid and tau, potentially increasing the risk for later development of Alzheimer's disease or other dementias (Gao et al., 2019), although the evidence is still inconclusive. Cross-sectional evidence showed that over 72% of carers reported moderate to severe sleep disturbance (Maltby et al., 2017), and carers had lower sleep durations akin to losing 2.42–3.50 h each week more than age-matched control non-carer adults (Gao et al., 2019). Our findings showed that the interaction between sleep and risk factors for dementia is significant for both women and men, and increases with age (Peng & Chang, 2013). In a study of younger adult carers balancing unpaid caring with paid employment (mean age 49.5) in Sweden, reducing caring responsibilities led to improved sleep quality (Sacco et al., 2018), suggesting a strong recovery rate for this subgroup of unpaid carers.

Subgroup analyses reveal different patterns in the relationship between caring and risk factors for dementia. Across various studies and geographical locations, women carers consistently exhibit worse health outcomes compared to men (Brimblecombe & Cartagena Farias, 2022; King et al., 2023; Lacey et al., 2018; Le & Ibuka, 2023; Ervin et al., 2022; Janson et al., 2022) except for two studies in Germany where males transitioning into caring consistently had worse outcomes (Zwar et al., 2020; Henning et al., 2023). This gender disparity underscores the importance of considering gender-specific factors in understanding the impact of caring on risk factors of dementia, including gender roles, which shows that, on average, women provide higher hours of care than men. Previous analyses suggest female carers may be more likely to work part-time (OR = 2.64, 95% CI: 1.46, 4.79) compared to female non-carers (Carr et al., 2018) predisposing female unpaid carers to develop lower cognitive reserve mechanisms through more complex and demanding jobs (Wang et al., 2024). Importantly, when looking at the evidence on young carers (King et al., 2023; Xue et al., 2023) and possible mechanisms of lower educational attainment and increased risk of dementia, the study by Wang et al. (Wang et al., 2024) suggests that individuals with higher educational attainment in early life have reduced risk of dementia later in life, also through enhanced cognitive reserve mechanisms (Wang et al., 2024). However, there is also evidence of a bidirectional association between lower educational attainment and unpaid care, with studies showing that individuals with lower educational attainment are more likely to become unpaid carers later in life (King et al., 2023; Xue et al., 2023), possibly due to socio-economic factors and limited access to resources.

Intensity of caring also plays a crucial role in the association between unpaid care and risk factors for dementia, with higher-intensity caring (≥10 h per week) (State of Caring 2023, 2023; Brimblecombe & Cartagena Farias, 2022; King et al., 2023; Roth et al., 2018; Xue et al., 2023; Ervin et al., 2022) and co-residence (Lacey et al., 2019; Le & Ibuka, 2023; Roth et al., 2018) demonstrating the strongest associations with adverse outcomes such as depression, sleep deprivation, lower educational attainment, and unemployment. Previous research has identified the threshold of 10 or more hours per week as the point at which caring significantly impacts carers, highlighting the importance of considering caring intensity in assessing its health implications (Roth et al., 2015; King & Pickard, 2013). Other studies included in this review suggest the threshold may be higher at 14 (Roth et al., 2018), 20 (Xue et al., 2023; Ervin et al., 2022), or even 44 h per week (Su, 2023). These findings underscore the need for targeted interventions, particularly for those providing high-intensity care, to mitigate the detrimental health effects associated with caring responsibilities. It is crucial to account for the interaction effect of multiple risk factors on the likelihood of developing or exacerbating dementia. Because of the interconnectedness of these risk factors, interventions that target one may positively influence the others. For example, an intervention that reduces depressive symptoms may also increase satisfaction in leisure activities, physical activity, and sleep quality.

It is important to note the absence of studies that met the eligibility criteria from low- and middle-income countries. Therefore, this review must be interpreted with caution in the context of LMICs. Moreover, even within high-income countries, cultural influences may not have been adequately accounted for in the included studies. Cultural differences in caregiving practices, attitudes toward ageing, and access to healthcare services could impact the observed relationship between unpaid caring and dementia risk factors. Therefore, the findings of this review may not fully capture the diverse experiences of unpaid carers across different cultural contexts. Future reviews could incorporate qualitative studies to explore this in greater depth, and quantitative research focusing on subgroup analyses, such as by different sociodemographic groups. Also, further research could expand on the narrative synthesis of the included reviews by conducting a quantitative meta-analysis. By calculating the effect size by risk factor and interaction effects, it may be possible to quantify the indirect effect of unpaid caring on cognitive health *via* modifiable risk factors which could be prevented or delayed. It may be important to stratify the analysis by key socio-demographic characteristics such as geography, gender, and age to control for factors such as cultural context and gender roles, and by intensity of caring.

Strengths and limitations

This review has several strengths and limitations. First, a comprehensive search was conducted following PRISMA guidelines, across multiple databases, guaranteeing that this rapid review is exhaustive, reducing the risk of bias and ensuring accuracy and reliability. Second, this review focuses on possible associations between unpaid caring and cognitive function, contributing to the existing body of literature to inform prevention and policy strategies. Many dementia risk factors overlap, making it challenging to isolate the specific contribution of unpaid caring to the risk of dementia. This overlap can lead to difficulty in establishing a causal relationship between unpaid caring and dementia risk; however, it shows the interdependence of risk factors of dementia and the need to consider these interactions when planning interventions. Third, most studies used large ageing-related surveys, such as the Japanese Study of Aging and Retirement (JSTAR) (Le & Ibuka, 2023) or the UK Household Longitudinal Study (UKHLS) dataset (Brimblecombe & Cartagena Farias, 2022; Gallagher & Wetherell, 2020; King et al., 2023; Lacey et al., 2018; Xue et al., 2023), which increases the robustness, accuracy and reliability of results.

Nevertheless, some studies included in this review used the same datasets, which can limit the generalisability of the findings to other populations. For example, five of the UK-based studies utilise the UK Household Longitudinal Study (UKHLS) dataset (Brimblecombe & Cartagena Farias, 2022; Gallagher &

Wetherell, 2020; King et al., 2023; Lacey et al., 2018; Xue et al., 2023) and three utilise the English Longitudinal Study of Ageing (ELSA) (Rafnsson et al., 2017; García-Castro et al., 2022; Yuan & Grühn, 2021), five of the German studies utilise the German Ageing Survey (Hajek & König, 2017; Hajek & König, 2019; Zwar et al., 2018; Zwar et al., 2020; Henning et al., 2023), and three of the US studies utilise Reasons for Geographic and Racial Differences in Stroke (REGARDS) dataset (Haley et al., 2015; Haley et al., 2020; Roth et al., 2018). Overreliance on certain datasets may also result in the duplication of results across studies, potentially skewing the findings of the review. Nevertheless, all studies using the same dataset leveraged different waves of data and therefore were included. Despite efforts to ensure rigour in study selection and data synthesis, these inherent limitations should be considered when interpreting the results of this review.

Conclusion

The impact of unpaid caring on cognitive health is multifaceted and influenced by various factors including gender, intensity of caring and cultural context. Understanding the association between unpaid caring on cognitive health is challenging due to the bidirectional associations between unpaid caring and most of the known risk factors. Nevertheless, the evidence shows that unpaid carers have a higher likelihood compared to non-carers of experiencing dementia risk factors such as depression and social isolation. The studies included in this rapid review suggest that depression and social isolation are interconnected with sleep and satisfaction in leisure activities. Studies that evaluate the direct link between unpaid caring and cognitive decline suggest that caring at low to moderate intensities, may act as a protective factor against dementia, but not at higher intensities. Across all studies, high-intensity caring negatively impacts carers' physical and mental health. This may, in turn, affect their cognitive health, leaving unpaid carers more likely than non-carers to need unpaid care and support and health and social services themselves in the future. By synthesising current evidence on these associations, this review contributes to a broader understanding of how the experience and conditions of unpaid care, especially high-intensity caring, are associated with cognitive decline and dementia risk factors, which can, in turn, inform prevention and policy strategies.

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