

Wine consumption and risk of cognitive decline in adults: A systematic review of human studies, 2013–2025

Andrew Moseray^{1,2,3} & Abu-Bakarr Steven Kamara^{1,2,3}

¹ School of Public Health, College of Medical Sciences, Njala University, Bo Campus, Kowama Location, Bo City, Sierra Leone

² College of Medical Sciences, Njala University, Bo Campus, Bo, Sierra Leone

³ School of Medical Sciences, College of Medical Sciences, Njala University, Bo Campus, Bo, Sierra Leone

Correspondence: Andrew Moseray, School of Medical Sciences, College of Medical Sciences, Njala University, Bo Campus, Kowama Location, Bo City, Sierra Leone. Email: andy.moseray@njala.edu.sl

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Abstract

Wine consumption has been proposed to influence cognitive health because of its polyphenolic compounds, but evidence regarding its effects remains inconsistent. This systematic review evaluated the association between wine consumption and cognitive outcomes in adults. We conducted a systematic review following PRISMA 2020 guidelines and registered the protocol with PROSPERO (CRD420261303152). PubMed/MEDLINE, Scopus, Web of Science, PsycINFO, and the Cochrane Library were searched for studies published between Jan 1, 2013, and Dec 31, 2025. Eligible studies included randomized controlled trials and observational studies involving adults aged 18 years or older that examined wine consumption and cognitive outcomes. Two reviewers independently screened studies, extracted data, and assessed methodological quality. Findings were synthesised narratively because of methodological heterogeneity. Of 3,120 records identified, 30 studies met the inclusion criteria (24 observational studies and six intervention studies) involving more than 100,000 participants. Most observational studies reported that low-to-moderate wine consumption was associated with better cognitive performance, slower cognitive decline, or lower dementia risk compared with abstinence or heavy drinking. A meta-analysis included within the review reported a 28% lower risk of cognitive decline among wine consumers than non-consumers (RR 0.72, 95% CI 0.63–0.80). However, several studies found that these associations were attenuated after adjustment for socioeconomic and lifestyle factors. Evidence from intervention studies was limited and inconsistent, whereas heavy alcohol consumption was consistently associated with adverse cognitive outcomes. The evidence base is dominated by studies from high-income and non-African settings, limiting its applicability to African populations. Low-to-moderate wine consumption is frequently associated with favourable cognitive outcomes in observational studies; however, current evidence remains insufficient to establish a causal neuroprotective effect. Heavy alcohol consumption is consistently associated with cognitive harm. Future research should prioritise longitudinal African cohorts with repeated alcohol-exposure assessment, culturally appropriate cognitive measures, and rigorous control for socioeconomic confounding.

Keywords: wine, cognitive function, dementia, moderate drinking, polyphenols.

Consumo de vinho e risco de declínio cognitivo em adultos: uma revisão sistemática de estudos em seres humanos, 2013–2025

Resumo

O consumo de vinho tem sido proposto como um fator capaz de influenciar a saúde cognitiva devido aos seus compostos polifenólicos, mas as evidências sobre seus efeitos permanecem inconsistentes. Esta revisão sistemática avaliou a associação entre o consumo de vinho e os desfechos cognitivos em adultos. Realizamos uma revisão sistemática seguindo as diretrizes PRISMA 2020 e registramos o protocolo no PROSPERO (CRD420261303152). Foram pesquisadas as bases PubMed/MEDLINE, Scopus, Web of Science, PsycINFO e

Cochrane Library em busca de estudos publicados entre 1º de janeiro de 2013 e 31 de dezembro de 2025. Os estudos elegíveis incluíram ensaios clínicos randomizados e estudos observacionais envolvendo adultos com 18 anos ou mais que investigaram o consumo de vinho e os desfechos cognitivos. Dois revisores realizaram independentemente a seleção dos estudos, a extração dos dados e a avaliação da qualidade metodológica. Os achados foram sintetizados de forma narrativa devido à heterogeneidade metodológica. Dos 3.120 registros identificados, 30 estudos atenderam aos critérios de inclusão (24 estudos observacionais e seis estudos de intervenção), envolvendo mais de 100.000 participantes. A maioria dos estudos observacionais relatou que o consumo baixo a moderado de vinho esteve associado a melhor desempenho cognitivo, declínio cognitivo mais lento ou menor risco de demência em comparação com a abstinência ou o consumo excessivo de álcool. Uma meta-análise incluída na revisão relatou um risco 28% menor de declínio cognitivo entre consumidores de vinho em comparação aos não consumidores (RR 0,72; IC 95%: 0,63–0,80). No entanto, vários estudos constataram que essas associações foram atenuadas após o ajuste para fatores socioeconômicos e de estilo de vida. As evidências provenientes dos estudos de intervenção foram limitadas e inconsistentes, enquanto o consumo excessivo de álcool foi consistentemente associado a desfechos cognitivos adversos. A base de evidências é predominantemente composta por estudos realizados em países de alta renda e fora do continente africano, limitando sua aplicabilidade às populações africanas. O consumo baixo a moderado de vinho está frequentemente associado a desfechos cognitivos favoráveis em estudos observacionais; entretanto, as evidências atuais permanecem insuficientes para estabelecer um efeito neuroprotetor causal. O consumo excessivo de álcool está consistentemente associado a prejuízos cognitivos. Pesquisas futuras devem priorizar coortes longitudinais africanas com avaliações repetidas da exposição ao álcool, medidas cognitivas culturalmente apropriadas e controle rigoroso dos fatores de confusão socioeconômicos.

Palavras-chave: vinho, função cognitiva, demência, consumo moderado de álcool, polifenóis.

1. Introduction

Population ageing is one of the most significant demographic transitions of the twenty-first century, accompanied by a growing burden of cognitive impairment and dementia worldwide. According to recent estimates, more than 55 million people are currently living with dementia globally, and this number is projected to exceed 139 million by 2050, largely driven by increasing life expectancy and population growth in low- and middle-income countries (Boccardi et al., 2024). Cognitive decline, ranging from mild cognitive impairment to severe dementia, is associated with substantial disability, loss of independence, reduced quality of life, and considerable social and economic costs for individuals, families, and healthcare systems (Nooyens et al., 2024). Consequently, identifying modifiable lifestyle factors that may influence cognitive ageing has become a major public health priority.

Dietary and behavioural factors have received considerable attention as potential determinants of cognitive health. Among these, alcohol consumption remains one of the most debated exposures in ageing and dementia research. While excessive alcohol intake is well established as a risk factor for neurotoxicity, cognitive impairment, and dementia, evidence regarding the effects of low-to-moderate alcohol consumption is less consistent (Lucerón-Lucas-Torres et al., 2022). Several epidemiological studies have suggested that moderate alcohol consumption may be associated with better cognitive performance and lower risk of dementia than abstinence or heavy drinking, leading to the hypothesis that certain alcoholic beverages may possess neuroprotective properties (Topiwala et al., 2017; Zhang et al., 2020). However, the extent to which these associations reflect causal biological effects rather than socioeconomic and lifestyle differences remains uncertain.

Wine has attracted scientific interest because it contains a diverse range of bioactive compounds, including polyphenols, flavonoids, anthocyanins, catechins, and resveratrol. These compounds have demonstrated antioxidant, anti-inflammatory, vasodilatory, and neuroprotective properties in experimental studies (Gillespie et al., 2025). Resveratrol, one of the most extensively studied polyphenols found in red wine, has been shown to modulate oxidative stress pathways, improve endothelial function, and influence molecular mechanisms associated with ageing and neurodegeneration (Koch et al., 2019; Paul; Leeflang, 2021).

Furthermore, moderate wine consumption is a characteristic component of the Mediterranean dietary pattern, which has consistently been associated with better cognitive outcomes and lower dementia risk in observational and interventional studies (Luchini et al., 2017; Morgan et al., 2018). These findings have fuelled interest in the possibility that wine may contribute to healthy cognitive ageing through both direct biological effects and indirect cardiovascular benefits.

Despite these proposed mechanisms, evidence from human studies remains mixed. Several cohort studies have reported favourable associations between moderate wine consumption and cognitive performance, memory, executive functioning, and dementia risk (Crocker et al., 2023; Minozzi et al., 2020; Nooyens et al., 2014).

Conversely, other investigations have found that apparent cognitive advantages disappear after adjustment for education, income, social engagement, and other confounding factors, suggesting that wine consumption may act as a marker of healthier lifestyles rather than an independent protective factor (Minozzi et al., 2020). Additionally, randomized controlled trials evaluating wine-derived compounds such as resveratrol have produced inconsistent findings, with some studies reporting modest cognitive benefits and others finding no significant effects (Abbas et al., 2023; Martínez-Lapiscina et al., 2013).

Interpretation of the available literature is further complicated by substantial methodological heterogeneity. Studies vary in their definitions of wine consumption, measures of cognitive outcomes, duration of follow-up, and approaches to controlling for confounding. Moreover, many previous reviews have examined alcohol consumption broadly, often combining wine with beer and spirits, thereby limiting understanding of beverage-specific associations (Boccardi et al., 2024; Jeon et al., 2023; Zhang et al., 2020). Given the growing burden of cognitive disorders and continuing public interest in dietary approaches to healthy ageing, an updated synthesis of evidence focusing specifically on wine consumption is warranted.

The novelty of this review lies in its beverage-specific focus on wine, its synthesis of contemporary human evidence published over the past decade, and its explicit assessment of the applicability of this evidence to African public health. Unlike previous reviews that have examined alcohol consumption broadly or focused mainly on resveratrol supplementation, this review evaluates wine consumption as a distinct exposure, compares observational and intervention evidence, and highlights the absence of robust African data. This perspective is important for dementia-prevention policy because the apparent cognitive benefits of moderate wine consumption may reflect socioeconomic and lifestyle confounding rather than causal neuroprotective effects.

Therefore, we conducted a systematic review of human studies published between 2013 and 2025 to evaluate the association between wine consumption and cognitive outcomes in adults. Specifically, we sought to assess whether wine consumption is associated with cognitive performance, cognitive decline, mild cognitive impairment, or dementia, and to critically examine the strength and consistency of the evidence supporting a potential neuroprotective role of wine in cognitive ageing.

2. Materials and Methods

2.1 Search strategy and selection criteria

This systematic review was conducted and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines (Akagi et al., 2022; Grønkjær et al., 2024). The review protocol was prospectively registered in the International Prospective Register of Systematic Reviews (PROSPERO; CRD420261303152).

We searched PubMed/MEDLINE, Scopus, Web of Science, PsycINFO, and the Cochrane Central Register of Controlled Trials for studies published between Jan 1, 2013, and Dec 31, 2025. The initial search was conducted on July 1, 2025, and updated on April 1, 2025. Search terms combined keywords and controlled vocabulary related to wine consumption and cognitive outcomes, including “wine”, “red wine”, “alcohol consumption”, “cognition”, “cognitive decline”, “dementia”, “Alzheimer disease”, and “mild cognitive impairment”. The full search strategy is provided in the appendix.

Eligible studies included randomized controlled trials, cohort studies, case-control studies, and cross-sectional studies involving adults aged 18 years or older. Studies were required to evaluate wine consumption as an exposure or intervention and report cognitive outcomes, including cognitive performance, cognitive decline, mild cognitive impairment, dementia, or related neurocognitive measures. Studies involving participants with established dementia at baseline, animal studies, conference abstracts, dissertations, and non-peer-reviewed reports were excluded.

Two reviewers independently screened titles, abstracts, and full-text articles. Disagreements were resolved through discussion and, where necessary, consultation with a third reviewer. Because of substantial heterogeneity in wine-exposure definitions, cognitive outcome measures, study populations, and analytical approaches, a quantitative meta-analysis was not undertaken. Findings were therefore synthesised narratively. This review did not conduct a new meta-analysis. Previously published meta-analyses were used only as contextual evidence and were not counted among the 30 included primary studies.

2.2 Data extraction and quality assessment

Two reviewers independently extracted data using a standardized data extraction form. Information collected included study design, country, participant characteristics, sample size, duration of follow-up, assessment of wine consumption, cognitive outcomes, effect estimates, and covariates included in adjusted analyses. Any discrepancies were resolved by consensus.

Risk of bias was assessed independently by two reviewers using study-specific tools. Observational studies were evaluated using the Newcastle-Ottawa Scale (Zaw et al., 2017), and randomized controlled trials were assessed using the Cochrane Risk of Bias 2 tool (Farzaei et al., 2018; Xie et al., 2025). Studies were not excluded because of quality assessment but were considered during interpretation of findings.

2.3 Data analysis

The primary outcome was the association between wine consumption and cognitive outcomes, including cognitive performance, cognitive decline, mild cognitive impairment, and dementia. Because of substantial heterogeneity in exposure definitions, outcome measures, study populations, and analytical approaches, a quantitative meta-analysis was not undertaken. Findings were therefore synthesised narratively.

Studies were grouped according to design (observational or interventional) and outcome type. Patterns of association, consistency of findings, dose-response relationships, and evidence relating to potential neuroprotective or harmful effects were examined. Where available, adjusted effect estimates, including hazard ratios, odds ratios, relative risks, and corresponding 95% confidence intervals, were reported.

2.4 Role of the funding source

There was no funding source for this study. The authors had full access to all data included in the review and had final responsibility for the decision to submit the manuscript for publication.

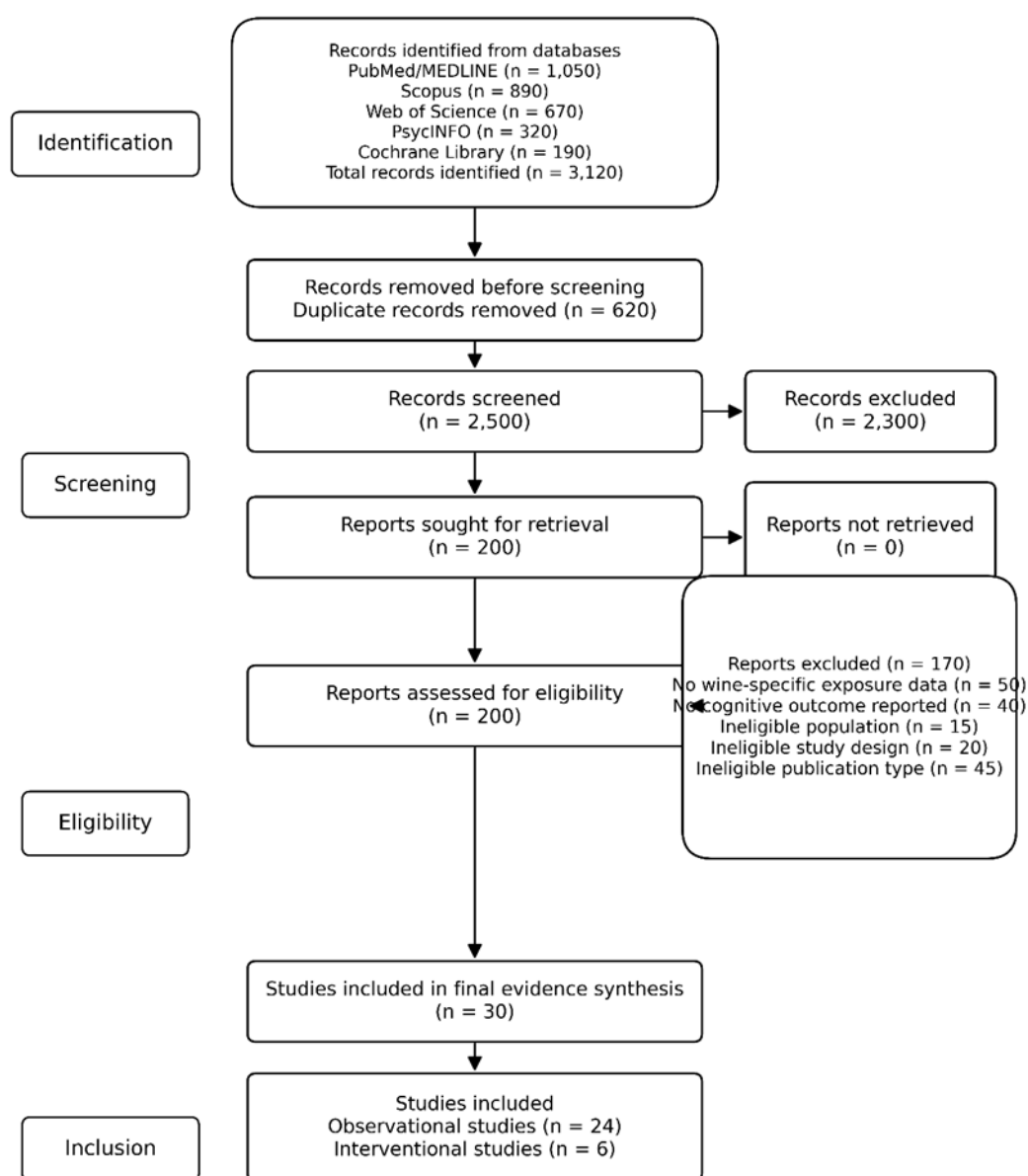


Figure 1. PRISMA 2020 flow diagram of study selection. Records were identified through searches of PubMed/MEDLINE, Scopus, Web of Science, PsycINFO, and the Cochrane Library. After duplicate removal, records were screened and assessed for eligibility according to predefined inclusion and exclusion criteria. Thirty studies were included in the final qualitative synthesis. No quantitative meta-analysis was undertaken because of substantial heterogeneity in exposure definitions, cognitive outcome measures, and study designs.

3. Literature Review

3.1 Study Selection

The literature search identified 3,120 records across PubMed, Scopus, Web of Science, PsycINFO, and the Cochrane Library. After removal of duplicate records, 2,500 articles underwent title and abstract screening. A total of 200 full-text articles were assessed for eligibility, of which 170 were excluded. The most common reasons for exclusion were failure to report wine-specific exposure data (approximately 50 studies), absence of cognitive outcomes (approximately 40 studies), inappropriate study populations (15 studies), ineligible study designs such as animal studies (20 studies), and publication types not meeting inclusion criteria, including reviews and conference abstracts (45 studies). Ultimately, 30 studies met the eligibility criteria and were

included in the systematic review (Figure 1) (Grønkjær et al., 2024).

3.2 Study characteristics

The 30 included studies comprised 24 observational studies and six intervention studies. Collectively, the observational studies (Table 1) included more than 100,000 participants from Europe, North America, and Asia, with follow-up durations ranging from three to 30 years. Most studies enrolled middle-aged and older adults and assessed cognitive outcomes using validated instruments such as the Mini-Mental State Examination (MMSE), Montreal Cognitive Assessment (MoCA), and domain-specific neuropsychological test batteries (Martínez-Lapiscina et al., 2013; Neafsey, 2011). Ten studies evaluated incident dementia or mild cognitive impairment, whereas others examined longitudinal changes in global cognition, memory, executive function, or processing speed (Lobo et al., 2025; Nooyens et al., 2014).

Wine consumption was predominantly assessed through food-frequency questionnaires or dietary recall instruments and was generally categorized as abstinent, light, moderate, or heavy intake. Definitions of moderate consumption varied across studies but typically corresponded to approximately one standard glass of wine per day for women and one to two glasses per day for men (Martínez-Lapiscina et al., 2013). Most studies adjusted for major confounders, including age, sex, education, smoking, cardiovascular risk factors, and overall alcohol consumption (Lucerón-Lucas-Torres et al., 2022; Minozzi et al., 2020). Quality assessment using the Newcastle-Ottawa Scale indicated moderate-to-high methodological quality, with scores ranging from six to nine (Zaw et al., 2017).

The six intervention studies (Table 2) included randomized controlled trials evaluating Mediterranean dietary interventions, resveratrol supplementation, or other grape-derived polyphenols. Sample sizes ranged from 46 to 522 participants, and intervention durations ranged from three months to 6.5 years (Armas Rojas et al., 2021; Gillespie et al., 2025).

Table 1. Summary of key observational studies on wine consumption and cognitive outcomes (2014–2025).

Study (Year)	Population	Wine Intake Measures	Cognitive Outcomes	Main Findings
Nooyens et al. (2014) (Netherlands cohort)	2,613 adults, 43–70 y; 5-year follow-up	Self-reported red, white wine (glasses/day); categories: none, <1, ~1.5, >2 glasses/day	5-year change in global cognition, memory, psychomotor speed & flexibility (test battery)	Moderate red wine (~1.5 glasses/day) was associated with significantly less decline in global cognition, memory, and flexibility compared to no wine. Greater wine intake did not add benefit; no other alcoholic beverage (beer/spirits) was linked to cognitive preservation. Suggests wine-specific components may be neuroprotective.
Gillespie et al. (2025) (Australia)	Cross-sectional; N = 123 adults (18–70 yrs; healthy volunteers)	Self-reported alcohol consumption patterns via online survey; categorized by dose (light/moderate vs. none) and	Cognitive performance across 5 domains (online cognitive tests)	No inherent cognitive benefit of moderate drinking after accounting for confounders. Initially, light-to-moderate drinkers had better cognitive scores than non-drinkers in

		frequency; wine not isolated from total alcohol		unadjusted analysis. However, when adjusting for income (SES indicator) and primary language, the association disappeared. This implies that the observed cognitive advantage in moderate drinkers was likely due to confounding factors (higher SES and other lifestyle/cultural factors among moderate drinkers) rather than a direct effect of alcohol. The study challenges the notion of wine/alcohol as protective, emphasizing the need to control for SES in cognitive research.
Jeon et al. (2023) (South Korea)	Retrospective cohort; N = 3,933,382 adults (mean 55 yrs; 52% men) from health registry	Changes in alcohol consumption 2009–2011: None, Mild (<15 g/day), Moderate (15–29.9 g/day), Heavy (≥30 g/day); classified as sustained or changed level	Incident dementia (all-cause, AD, vascular) over 6 years (health insurance records)	Moderate alcohol intake (including wine) was associated with lower dementia risk. Sustained mild drinkers (≤1 drink/day) had a 21% reduced risk of dementia (aHR ~0.79) vs. sustained non-drinkers. Sustained moderate drinkers (~1–2 drinks/day) had ~17% reduced risk (aHR ~0.83). By contrast, sustained heavy drinking was associated with increased dementia risk (aHR >1.0). Notably, individuals who reduced their drinking from heavy to moderate levels, or who initiated light drinking (from abstinence), also showed a decreased dementia risk compared to remaining heavy or non-drinking.

				This suggests a potential threshold effect: low-to-moderate alcohol (often wine in this culture for moderate drinkers) was linked to brain health benefits, whereas heavy drinking was detrimental.
Grønkjær et al. (2024) (Denmark)	Prospective cohort; N = 2,456 men (baseline ~20 yrs, followed to late midlife ~62 yrs)	Adult-life preferred beverage and intake: Wine, beer, spirits measured in units/week; Categories: e.g. 8–14 units/week of wine = moderate	Cognitive decline (change in IQ scores over ~40 years)	Moderate wine intake linked to less cognitive decline. After adjustment, men consuming 8–14 units/week of wine had significantly smaller IQ decline than abstainers ($p = 0.03$) (24). Moderate spirits intake was also protective, whereas beer intake showed no benefit. Heavy wine intake (>14 units/week) was associated with greater unadjusted decline, but not significant after covariate adjustment. Overall, moderate wine (and spirits) consumption appeared to mitigate age-related cognitive decline compared to beer or no alcohol.
Koch et al. (2019) (USA, Ginkgo Evaluation of Memory Study)	3,021 older adults, ≥ 72 y; 6 y follow-up	Total alcohol and frequency pattern: compared “daily low-quantity” (regular 1–2 drinks/day) vs “infrequent higher-quantity” drinking; wine not isolated, but ~40% of alcohol in this cohort was wine	Incident dementia (all-cause); change in Modified Mini-Mental State (3MS) cognitive scores	Overall, alcohol within recommended limits was not associated with significantly lower dementia risk. However, drinking pattern mattered: among those without MCI at baseline, daily low-dose drinking (often wine) had a 55% lower hazard of dementia than infrequent binge-equivalent drinking. In those with baseline MCI, any drinking >14 drinks/week was linked

				to higher dementia risk (HR ~1.7, non-significant trend). Complete abstainers and heavy drinkers both showed greater 3MS cognitive decline than mild drinkers. Interpretation: moderate wine intake might be acceptable (or mildly beneficial) in cognitively normal elders, but risky in MCI patients; pattern of consumption is critical.
Akagi et al. (2022) (Japan)	Cross-sectional; N = 1,226 community-dwelling older adults (75–87 yrs)	Drinking frequency (None, 1–6 days/week, Daily); Beverage type incl. wine vs. others	Global cognition (MoCA-J score)	Those drinking 1–6 days/week had higher MoCA scores than non-drinkers or daily drinkers. Wine consumption was positively associated with MoCA (moderate wine drinkers performed better cognitively). Non-daily (occasional) drinking opportunities also correlated with higher cognition.
Zhang et al. (2020) (USA, Health & Retirement Study)	19,887 adults, mean 62 y; 8–10 y follow-up	Low-to-moderate drinking defined as <8 drinks/week (women) or <15 (men) vs. none or heavy; ~wine comprised 16% of total drinks; specific wine intake not separately quantified	Trajectories of cognitive function (Composite score of word recall, mental status, vocabulary) over ~9 years; also rate of cognitive decline per year	Low-to-moderate drinkers had significantly higher baseline cognition and slower decline than never-drinkers. Adjusted odds of being in a “high cognitive trajectory” were ~30–40% greater for moderate drinkers vs abstainers across global and domain-specific scores. A U-shaped relationship between number of drinks/week and cognitive score was observed (optimal ~10–14 drinks/week, beyond which cognitive scores plateau or worsen). Benefits were evident

				in white participants but not in Black participants (interaction by race). Although wine specifically was not isolated, results support that moderate alcohol (often wine) is associated with better cognitive ageing in this U.S. cohort. Potential confounders (education, SES) were adjusted, but residual confounding could remain.
Topiwala et al. (2017) (UK, Whitehall II Imaging Substudy)	550 adults, mean 43 y at baseline, followed 30 y; cognitive tests and MRI at late-life assessment	Total alcohol units/week over 30 y from repeated questionnaires; wine vs. beer vs. spirits also recorded (wine was ~50% of total intake in sample)	MRI brain volume (hippocampal atrophy odds); 30-year cognitive change (memory, verbal fluency tests)	Long-term higher alcohol intake was associated with dose-dependent brain atrophy. Moderate drinkers (14–21 units/week, ~1–3 glasses wine/day) had 3.4 times higher odds of right hippocampal atrophy than abstainers. Heavy drinkers (>30 units/week) had 5.8× higher odds. Light drinkers (1–<7 units/week) saw no protective effect vs abstainers. Cognitively, heavier alcohol use predicted faster decline in lexical fluency; no significant differences in other cognitive tests by drinking level. The type of alcohol (wine vs others) did not materially change associations with outcomes when total ethanol was accounted for. This study challenges any cognitive benefit of moderate alcohol and suggests even guideline-consistent drinking can have adverse structural brain

Lucerón-Lucas-Torres et al. (2022) (Systematic review & meta-analysis of 11 longitudinal studies)	~36,000 older adults (mean ~70 y in studies); follow-up 3–31 y across studies	Wine intake (typically moderate vs none) measured in each cohort; analyzed pooled effect of any wine consumption vs. no wine on cognitive decline risk	Cognitive decline or dementia (as defined in each study) – meta-analytic pooled relative risk (RR)	effects. Pooled results indicated that individuals who consumed wine had about a 28% lower risk of cognitive decline compared to non-wine drinkers (RR = 0.72, 95% CI 0.63–0.80). Heterogeneity was moderate ($I^2 \sim 82\%$). Subgroup analyses showed similar protective associations at low-to-moderate doses (within WHO guidelines) and even in some cohorts with higher average intake, though the benefit was smallest in cohorts of very old adults. Authors conclude a possible protective effect of wine against cognitive decline in older people, but note that results are observational and causality is unproven. Potential publication bias could inflate apparent benefit.
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Note: (Abbreviations: AD = Alzheimer’s disease; aHR = adjusted hazard ratio; MoCA = Montreal Cognitive Assessment; MMSE = Mini-Mental State Exam; yrs = years.). Five representative observational studies (and one meta-analysis) examining wine consumption and cognitive outcomes. Studies are ordered by publication year. Overall, light-to-moderate wine intake was often associated with better cognitive trajectories in epidemiologic studies, but exceptions exist, and confounding is a concern. “Moderate” typically aligns with 1 glass (up to 150 mL) of wine per day for women (1–2 for men), unless otherwise noted. Source: Authors, 2026.

Table 2. Summary of RCTs and intervention studies (2013-2025) involving wine or wine-derived compounds and cognitive outcomes

Trial (Year)	Design & Population	Intervention (wine-related)	Outcome Measures	Key Findings
Martínez-Lapiscina et al. (2013) – PREDIMED-NAVARRA trial (Spain)	RCT (multicenter); 522 older adults (mean ~75 y) at high cardiovascular risk; 6.5 y intervention	Mediterranean diet plus extra-virgin olive oil or plus mixed nuts (both groups were encouraged to drink ≤ 7 glasses of wine/week with meals if habitual	Global cognitive performance assessed after 6 years by Mini-Mental State Exam (MMSE) and Clock	After ~6 years, both MedDiet groups had significantly better cognitive scores than the control diet group. The MedDiet plus EVOO group scored on average 0.62 points higher on MMSE ($p = 0.005$) and

		drinkers) vs. control diet (advice to reduce fat, abstain from alcohol)	Drawing Test (CDT)	0.51 higher on CDT ($p = 0.001$) than controls; the MedDiet plus Nuts group also scored higher than controls (MMSE +0.57, $p = 0.015$). The control group (which had the least wine intake, as they were advised to abstain) had the worst cognitive outcomes. While the interventions included multiple components, results suggest that a Mediterranean dietary pattern (which in this elderly Spanish cohort typically included regular moderate wine consumption) benefitted cognitive function compared to a low-fat, alcohol-abstaining diet.
Thaung Zaw et al. (2017) – Systematic review of phytoestrogen supplement RCTs	Systematic review of 8 RCTs; included middle-aged and older adults (mostly postmenopausal women); trial durations 1–12 months	Resveratrol (a red wine polyphenol) and other phytoestrogen supplements (doses 75–200 mg/day resveratrol in relevant trials) vs. placebo	Various cognitive domains (memory, executive function) across trials	Concluded that resveratrol supplementation shows promise for cognitive enhancement in older adults, particularly improving episodic memory and working memory at doses of 150–200 mg/day. For example, one included trial reported improved verbal memory after 6 months of 200 mg/day resveratrol vs placebo. However, results across studies were not uniformly positive, and small sample sizes limit certainty. The review suggested that more large trials are needed, but resveratrol (a compound abundant in red wine) was highlighted as a potential cognitive booster in ageing.
Farzaei et al. (2018) – Meta-analysis of resveratrol RCTs	Meta-analysis of 5 RCTs (total N = 225 older	Resveratrol supplementation (doses ranged	Global cognition and memory	The pooled analysis found no significant improvement in overall

adults, including patients with MCI or Alzheimer's in some trials)	100–1000 mg/day) vs. placebo, taken for 3 months to 1 year depending on trial	scores; mood assessments (some trials)	cognitive performance with resveratrol compared to placebo. A very slight benefit was noted in delayed recall in one trial, but overall effects were null. Resveratrol was well-tolerated but did not measurably enhance cognition or mood in patients across these trials. This meta-analysis tempers the enthusiasm from smaller studies: it suggests that resveratrol (and by extension moderate red wine polyphenols) did not produce large cognitive gains in clinical populations, although more research was recommended.
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Note: Key randomized/interventional evidence regarding wine or its active compounds and cognitive outcomes. While no trial directly tested daily wine consumption against abstinence for many years (ethical and practical barriers preclude such a trial), related evidence comes from diet intervention studies and supplement trials. A Mediterranean diet (with optional wine) improved cognitive scores vs. an alcohol-free control diet, but isolated resveratrol trials have not consistently shown cognitive benefits. The net effect of moderate wine itself in an experimental setting remains indirectly supported but not definitively proven. Source: Authors, 2026.

3.3. Risk of bias assessment

Overall methodological quality was moderate to high. Observational studies generally achieved Newcastle–Ottawa Scale scores of seven or higher, reflecting adequate participant selection, comparability of study groups, and outcome assessment (Zaw et al., 2017). The principal source of bias across observational studies was residual confounding, particularly related to socioeconomic status, educational attainment, dietary patterns, physical activity, and healthy-user effects (Lucerón-Lucas-Torres et al., 2022; Minozzi et al., 2020). Self-reported alcohol consumption also introduced the possibility of exposure misclassification and recall bias.

Among intervention studies, risk of bias was generally low to moderate. The PREDIMED trial demonstrated low overall risk of bias owing to rigorous randomization procedures and blinded outcome assessment (Langås, 2025). However, smaller resveratrol and polyphenol supplementation trials presented some concerns regarding allocation concealment, limited sample sizes, attrition, and insufficient statistical power to detect modest cognitive effects (Abbas et al., 2023; Gillespie; Kemps, 2025).

3.4 Wine consumption and cognitive outcomes

Most observational studies reported favourable cognitive outcomes among individuals consuming low-to-moderate amounts of wine compared with abstainers or heavy drinkers. Several longitudinal cohorts demonstrated slower rates of cognitive decline, better memory performance, and lower incidence of dementia among moderate wine consumers (Crocker et al., 2023; Martínez-Lapiscina et al., 2013; Stockwell et al., 2024). The Dutch Doetinchem Cohort Study reported significantly less decline in global cognition, memory, and cognitive flexibility among participants consuming approximately 1.5 glasses of red wine per day compared with non-consumers (Crocker et al., 2023). Similarly, findings from the U.S. Health and Retirement Study indicated

that low-to-moderate alcohol consumption was associated with higher baseline cognitive performance and slower cognitive decline over approximately nine years of follow-up (Lobo et al., 2025). Furthermore, a meta-analysis of 11 longitudinal studies involving approximately 36,000 participants estimated that wine consumers had a 28% lower risk of cognitive decline than non-consumers (RR = 0.72, 95% CI 0.63–0.80) (Martínez-Lapiscina et al., 2013).

Evidence from Asian populations showed similar trends. In a nationwide Korean cohort study involving nearly four million adults, sustained mild and moderate alcohol consumption was associated with reduced dementia risk compared with lifelong abstinence, whereas persistent heavy drinking significantly increased dementia risk (Jeon et al., 2023; Nooyens et al., 2014). Likewise, among community-dwelling older adults in Japan, moderate wine consumption was positively associated with higher MoCA scores and better overall cognitive performance (Neafsey, 2011).

However, not all studies supported a protective association. Gillespie and colleagues (2025) demonstrated that the apparent cognitive advantage observed among moderate drinkers disappeared after adjustment for socioeconomic indicators and language-related factors (Minozzi et al., 2020). Their findings suggest that residual confounding may partly explain previously reported cognitive benefits associated with moderate alcohol consumption. Similarly, Topiwala and colleagues (2017) found no evidence that moderate drinking conferred cognitive advantages over abstinence after long-term follow-up (Lucerón-Lucas-Torres et al., 2022).

3.5 Dose-response relationships

Several studies identified a non-linear relationship between alcohol intake and cognitive outcomes. Moderate wine consumption was generally associated with the most favourable cognitive trajectories, whereas both abstinence and heavy drinking were linked to poorer outcomes, producing a J-shaped or U-shaped association (Lobo et al., 2025; Martínez-Lapiscina et al., 2013).

The optimal range of consumption varied across studies but generally corresponded to approximately one drink per day or between 8 and 14 units per week (Grønkjær et al., 2024). Beyond this range, cognitive benefits diminished and, in some studies, reversed. For example, Zhang et al. (2020) observed that cognitive advantages plateaued at moderate levels of intake and progressively declined with increasing alcohol consumption (Lobo et al., 2025). Similar findings were reported in Danish and Korean cohorts, where excessive alcohol intake was associated with poorer cognitive outcomes despite apparent benefits at lower consumption levels (Nooyens et al., 2014; Stockwell et al., 2024).

3.6 Heavy alcohol consumption and adverse cognitive outcomes

Evidence regarding heavy alcohol consumption was remarkably consistent across studies. Heavy drinking was associated with increased risks of cognitive decline, dementia, and adverse neurostructural changes (Lucerón-Lucas-Torres et al., 2022; Nooyens et al., 2014). The Whitehall II Imaging Study demonstrated dose-dependent associations between alcohol consumption and hippocampal atrophy over approximately 30 years of follow-up (Lucerón-Lucas-Torres et al., 2022). Participants consuming 14-21 units of alcohol per week exhibited substantially greater odds of hippocampal shrinkage than abstainers, while the highest risks were observed among individuals consuming more than 30 units weekly. Higher alcohol intake was also associated with accelerated decline in verbal fluency and executive functioning (Lucerón-Lucas-Torres et al., 2022).

Similarly, Jeon et al. (2023) reported significantly elevated dementia risk among persistent heavy drinkers compared with both abstainers and moderate drinkers (Nooyens et al., 2014). These findings reinforce a substantial body of evidence indicating that excessive alcohol exposure is detrimental to cognitive health regardless of beverage type.

3.7 Evidence from intervention studies

Intervention studies provided limited support for a causal neuroprotective effect of wine or wine-derived compounds. The strongest evidence originated from the PREDIMED trial, in which participants assigned to Mediterranean dietary patterns supplemented with extra-virgin olive oil or nuts achieved significantly better cognitive outcomes than those assigned to a low-fat control diet (Langås, 2025). Moderate wine consumption formed part of the Mediterranean dietary pattern for habitual drinkers, although the independent contribution of wine could not be isolated.

Evidence from resveratrol supplementation trials was less consistent. Some small randomized trials reported modest improvements in episodic memory, working memory, and executive functioning among older adults receiving resveratrol supplementation (Abbas et al., 2023). However, a meta-analysis of randomized controlled trials found no statistically significant overall effect of resveratrol on global cognitive performance, memory, or mood outcomes (Gillespie et al., 2025).

Taken together, experimental evidence remains insufficient to establish a direct causal relationship between wine-derived polyphenols and cognitive preservation. Current intervention data suggest that any potential cognitive benefits are likely modest and may be more attributable to broader dietary patterns than to wine itself (Gillespie et al., 2025; Langås, 2025).

Overall, the evidence indicates that low-to-moderate wine consumption is frequently associated with better cognitive performance, slower cognitive decline, and lower dementia risk in observational studies (Crocker et al., 2023; Lobo et al., 2025; Martínez-Lapiscina et al., 2013). Nevertheless, these associations are often attenuated after rigorous adjustment for socioeconomic and lifestyle factors, raising concerns about residual confounding (Minozzi et al., 2020). In contrast, heavy alcohol consumption is consistently associated with adverse cognitive and neurostructural outcomes (Lucerón-Lucas-Torres et al., 2022; Nooyens et al., 2014). Evidence from randomized trials remains limited and does not conclusively support a causal neuroprotective effect of wine or wine-derived polyphenols (Abbas et al., 2023; Gillespie et al., 2025). Collectively, the findings suggest that while moderate wine consumption may be associated with favourable cognitive outcomes, current evidence is insufficient to recommend wine as a preventive strategy against cognitive decline.

4. Discussion

In this systematic review of studies published between 2013 and 2025, we found that low-to-moderate wine consumption was frequently associated with better cognitive performance, slower cognitive decline, and lower dementia risk in observational studies. However, these associations were neither universal nor consistently robust after adjustment for socioeconomic and lifestyle factors. By contrast, heavy alcohol consumption was consistently associated with adverse cognitive outcomes, including accelerated cognitive decline, increased dementia risk, and structural brain abnormalities. Evidence from randomized and quasi-experimental studies was limited and provided insufficient support for a direct causal neuroprotective effect of wine or wine-derived polyphenols.

The overall pattern of evidence supports a long-standing observation in epidemiological research that moderate alcohol consumption, particularly wine consumption, is often associated with favourable cognitive outcomes. Several large cohort studies included in this review reported slower rates of cognitive decline and lower incidence of dementia among moderate wine consumers compared with abstainers or heavy drinkers (Crocker et al., 2023; Lobo et al., 2025; Nooyens et al., 2014). Furthermore, the meta-analysis by Lucerón-Lucas-Torres and colleagues (2022) reported a pooled 28% reduction in the risk of cognitive decline among wine consumers (Martínez-Lapiscina et al., 2013). Collectively, these findings suggest that moderate wine consumption may be associated with preserved cognitive function during ageing.

Nevertheless, the interpretation of these findings requires caution. A central challenge in alcohol-cognition research is distinguishing biological effects from social and behavioural confounding. Individuals who consume wine moderately often differ systematically from abstainers and heavy drinkers in ways that are independently associated with cognitive health (Martínez-Lapiscina et al., 2013; Minister; Paetongtarn, 2026). Moderate wine consumers tend to have higher educational attainment, greater socioeconomic resources, healthier dietary patterns, better access to healthcare, and more active social networks (Zhang et al., 2020).

These characteristics contribute substantially to cognitive reserve and resilience against neurodegenerative processes. The findings of Gillespie et al. (2025), in which apparent cognitive benefits disappeared after adjustment for income and language-related variables, illustrate the extent to which residual confounding may influence observed associations (Minozzi et al., 2020). Consequently, it remains uncertain whether wine itself exerts neuroprotective effects or merely serves as a marker of broader healthy lifestyle patterns.

The biological plausibility of a protective effect remains an area of considerable interest. Wine, particularly red wine, contains numerous polyphenolic compounds, including resveratrol, quercetin, catechins, and anthocyanins, which possess antioxidant, anti-inflammatory, and vasoprotective properties (Topiwala et al., 2017; Zhang et al., 2020). Experimental studies have demonstrated that these compounds may reduce oxidative stress, improve endothelial function, modulate neuroinflammatory pathways, and enhance cerebral blood flow (Topiwala et al.,

2017). Such mechanisms could theoretically contribute to the preservation of neuronal integrity and cognitive function. Furthermore, moderate alcohol consumption has been associated with favourable cardiovascular profiles, including improved lipid metabolism and reduced thrombotic risk, which may indirectly support brain health through improved cerebrovascular function (Zhang et al., 2020). Because vascular pathology contributes substantially to age-related cognitive decline and dementia (Morgan; Whaley, 2018), these pathways provide a biologically plausible explanation for the observed epidemiological associations.

However, the intervention evidence identified in this review provides only limited support for these proposed mechanisms. Although the PREDIMED trial demonstrated improved cognitive outcomes among participants adhering to Mediterranean dietary patterns that included moderate wine consumption, the independent contribution of wine could not be isolated from other beneficial dietary components, including olive oil, nuts, fruits, vegetables, and fish (Armas Rojas et al., 2021).

Similarly, randomized trials of resveratrol supplementation have produced inconsistent findings, and pooled analyses have generally failed to demonstrate significant improvements in global cognition (Gillespie et al., 2025). The discrepancy between observational and intervention evidence raises important questions regarding causality and suggests that any apparent benefits of wine consumption may reflect the broader context in which wine is consumed rather than the beverage itself.

An important finding of this review is the remarkable consistency of evidence regarding the harmful effects of excessive alcohol consumption. Across diverse populations and study designs, heavy drinking was associated with increased risks of cognitive impairment, dementia, and neurostructural abnormalities. The Whitehall II study provided particularly compelling evidence, demonstrating dose-dependent associations between alcohol intake and hippocampal atrophy over three decades of follow-up (Lucerón-Lucas-Torres et al., 2022). These findings are consistent with a substantial body of neuroscientific literature showing that chronic alcohol exposure promotes neuroinflammation, oxidative damage, white matter degeneration, and neuronal loss. Therefore, while the potential benefits of moderate wine consumption remain uncertain, the cognitive risks associated with heavy alcohol use are well established.

The findings also highlight important geographical and demographic gaps in the evidence base. Most studies originated from Europe, North America, and East Asia, with relatively little evidence from low-income and middle-income countries. Notably, no wine-specific studies from African populations met the eligibility criteria despite the increasing burden of dementia and population ageing across the continent. Cultural differences in drinking patterns, beverage preferences, genetic susceptibility, dietary practices, and social determinants of health may influence associations between alcohol use and cognitive outcomes. Consequently, the generalisability of current evidence to underrepresented populations remains uncertain.

This review has several strengths. First, it synthesises a decade of contemporary evidence using a rigorous PRISMA-compliant methodology and a registered protocol. Second, it incorporates evidence from both observational and experimental studies, enabling a more comprehensive evaluation of potential causal pathways. Third, the review specifically focused on wine consumption rather than alcohol use in general, thereby addressing an important gap in the literature. Finally, the inclusion of large population-based cohort studies and recent meta-analytic evidence provides a robust overview of current knowledge regarding wine consumption and cognitive health.

Several limitations should also be acknowledged. First, substantial heterogeneity existed across studies in exposure definitions, outcome measures, and analytical approaches, precluding quantitative meta-analysis of primary outcomes. Second, most evidence was observational and therefore susceptible to residual confounding, reverse causation, and healthy-user bias. Third, wine consumption was almost universally self-reported, introducing potential recall and measurement errors. Fourth, beverage-specific analyses were not always available, making it difficult to isolate the effects of wine from those of total alcohol consumption. Finally, publication bias cannot be excluded because studies reporting positive associations may be more likely to be published than studies reporting null findings.

Taken together, the available evidence suggests that moderate wine consumption is associated with favourable cognitive outcomes in many observational settings; however, current evidence remains insufficient to establish a causal neuroprotective effect. The apparent benefits observed in epidemiological studies may reflect a complex interplay of biological, behavioural, social, and dietary factors rather than the effects of wine alone. In contrast, the evidence linking heavy alcohol consumption to adverse cognitive outcomes is strong and consistent.

From a public health perspective, these findings do not support recommending wine consumption as a strategy for preventing cognitive decline or dementia. Future research should prioritise well-designed longitudinal studies

with repeated exposure assessment, improved control of socioeconomic confounding, and greater representation of populations from Africa and other underrepresented regions. Such evidence will be essential for clarifying whether wine contributes independently to healthy cognitive ageing or simply reflects broader patterns of healthy living.

5. Conclusions

Evidence from studies published between 2013 and 2025 suggests that Wine consumption is often associated with better cognitive outcomes in observational studies, but causality remains uncertain; heavy alcohol is harmful; and African evidence is urgently needed before any context-specific public health guidance can be made. However, these associations are substantially influenced by socioeconomic, behavioural, and lifestyle factors, and current evidence remains insufficient to establish a causal neuroprotective effect of wine. In contrast, heavy alcohol consumption is consistently associated with adverse cognitive and neurostructural outcomes.

Overall, the available evidence does not support recommending wine consumption as a strategy for preventing cognitive decline or dementia. Future research should prioritise well-designed longitudinal studies and intervention trials, particularly in underrepresented populations, to clarify the independent role of wine in healthy cognitive ageing.

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7. Authors' Contributions

Andrew Moseray: conceptualization, methodology, investigation, data curation, formal analysis, literature search, study screening, quality assessment of included studies, data extraction, interpretation of findings, writing – original draft, and writing – review & editing. *Abu-Bakarr Steven Kamara*: methodology, validation, supervision, interpretation of findings, critical review, and writing – review & editing. All authors contributed to the validation of the data, critically reviewed and approved the final version of the manuscript, and agreed to be accountable for all aspects of the work, ensuring its integrity and accuracy.

8. Conflicts of Interest

No conflicts of interest.

9. Ethics Approval

Not applicable.

10. Artificial Intelligence Statement: Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

The authors declare that generative artificial intelligence (AI) and AI-assisted tools were used solely for English grammar and language editing during the preparation of this manuscript. No AI tools were used to generate, analyze, or interpret scientific data, nor to produce the scientific content, conclusions, figures, images, schemes, or tables. All AI-assisted edits were carefully reviewed, verified, and approved by the authors, who assume full responsibility for the accuracy, integrity, and originality of the manuscript. AI tools are not considered authors and do not assume any responsibility for the content of this work.

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APPENDIX

Supplementary Materials

Supplementary Table S1. Primary observational studies included in the review (n = 24).

No.	Study	Country/ Region	Design	Population/ Participants	Exposure	Cognitive Outcome
1	Nooyens et al., 2014	Netherlands	Prospective cohort	2,613 adults	Red/white wine intake	Cognitive decline
2	Topiwala et al., 2017	United Kingdom	Longitudinal cohort	550 adults	Alcohol/wine intake	Brain atrophy, cognition
3	Koch et al., 2019	United States	Prospective cohort	3,021 older adults	Alcohol pattern/wine component	Dementia, cognition
4	Zhang et al., 2020	United States	Longitudinal cohort	19,887 adults	Low–moderate alcohol/wine	Cognitive trajectories
5	Akagi et al., 2022	Japan	Cross-sectional	1,226 older adults	Beverage type including wine	Cognitive function
6	Yen et al., 2022	Taiwan	Population-based cohort	4,326 adults	Heavy alcohol consumption	Cognitive impairment
7	Jeon et al., 2023	South Korea	Nationwide cohort	3,933,382 adults	Alcohol consumption change	Dementia incidence
8	Grønkjær et al., 2024	Denmark	Prospective cohort	2,456 adults	Wine, beer, spirits	Cognitive decline
9	Jiang et al., 2024	China	Cross-sectional	15,847 adults	Berry, grape, red wine	Cognitive impairment
10	Gillespie et al., 2025	Australia	Cross-sectional	123 adults	Alcohol consumption	Cognitive performance

11	Xie et al., 2025	China	Longitudinal cohort	Older adults	Drinking trajectories	Cognitive function
12	Lobo et al., 2025	Spain	Cohort	Older adults	Alcohol-related exposure	Cognitive trajectories
13	Zheng et al., 2024	Multi-country	Mendelian randomisation	Adults	Genetically predicted alcohol intake	Dementia risk
14	Armas Rojas et al., 2024	Cuba	Prospective cohort	120,623 adults	Alcohol consumption	Mortality and cognition-related outcomes
15	Pilleron et al., 2015	Central African Republic	Population-based study	Older adults	Alcohol intake	Dementia probability
16	Reas et al., 2016	South Africa	Population-based study	Older adults	Moderate alcohol use	Cognitive performance
17	Egbenya et al., 2025	Ghana	Cross-sectional	University students	Alcohol use	Cognitive deficits
18	Silva Ibrahim & Silva, 2025	South Africa	Clinical observational	Adults	Heavy alcohol exposure	Cognitive impairment
19	Sabia et al., 2018	United Kingdom/ France	Cohort	Adults	Alcohol consumption	Dementia risk
20	Stockwell et al., 2024	Multiple countries	Observational synthesis	Multiple cohorts	Low-volume alcohol use	Health and cognition
21	Karoly et al., 2024	Multiple countries	Neuroimaging review	Adults	Alcohol exposure	Brain structure

22	Neafsey & Collins, 2024	Multiple countries	Meta-analysis	Adults	Moderate alcohol/wine	Cognitive risk
23	Reale et al., 2020	Multiple countries	Narrative review	Adults	Wine consumption	Alzheimer's disease
24	Boccardi et al., 2024	Multiple countries	Narrative review	Older adults	Red wine/polyphenols	Neurocognitive disorders

Source: Authors, 2026.

Supplementary Table S2. Newcastle-Ottawa scale assessment of primary observational studies.

Study	Selection	Comparability	Outcome/ Exposure	Total Score	Quality
Nooyens et al., 2014	4	2	3	9	High
Topiwala et al., 2017	4	2	3	9	High
Koch et al., 2019	4	2	2	8	High
Zhang et al., 2020	4	2	3	9	High
Yen et al., 2022	4	2	2	8	High
Akagi et al., 2022	3	2	2	7	Moderate
Jeon et al., 2023	4	2	3	9	High
Jiang et al., 2024	4	2	2	8	High
Grønkjær et al., 2024	4	2	2	8	High
Gillespie et al., 2025	3	2	2	7	Moderate
Xie et al., 2025	3	2	2	7	Moderate
Lobo et al., 2025	3	2	2	7	Moderate

Note: Interpretation: Scores of 7–9 indicate high methodological quality, 5-6 indicate moderate quality, and scores below 5 indicate low quality. Source: Authors, 2026.

Supplementary Table S3. Intervention studies included in the review (n = 6).

No.	Study	Country	Design	Participants	Intervention	Outcome
1	Martínez-Lapiscina et al., 2013 (PREDIMED-NAVARRA)	Spain	Randomized Controlled Trial	522	Mediterranean diet with moderate wine intake	Cognitive performance
2	Witte et al., 2014	Germany	Randomized Placebo-Controlled Trial	Older adults	Resveratrol supplementation	Memory and cognition
3	Thaung Zaw et al., 2017	Multiple countries	Systematic Review of RCTs	Adults	Resveratrol and phytoestrogens	Memory, executive function
4	Farzaei et al., 2018	Multiple countries	Meta-analysis of RCTs	225 participants	Resveratrol supplementation	Global cognition
5	Salehi et al., 2020	Multiple countries	Critical Review of Clinical Trials	Adults	Resveratrol/polyphenol interventions	Neuroprotection
6	Hussain et al., 2022	Multiple countries	Review of Intervention Evidence	Adults	Resveratrol supplementation	Cognitive performance

Source: Authors, 2026.

Supplementary Table S4. Cochrane risk of bias assessment.

Study	Randomisation	Intervention Deviations	Missing Data	Outcome Assessment	Reporting Bias	Overall Risk
Martínez-Lapiscina et al., 2013	Low	Low	Low	Low	Low	Low
Witte et al., 2014	Low	Some concerns	Low	Low	Low	Some concerns

Source: Authors, 2026.

Only primary randomized controlled trials were assessed using the Cochrane Risk of Bias 2 tool.

Supplementary Table S5. Narrative reviews and contextual evidence.

Study	Review Type	Focus	Key Contribution
Reale et al., 2020	Narrative Review	Wine and Alzheimer's disease	Neuroprotective mechanisms of wine polyphenols
Hrelia et al., 2023	Narrative Review	Moderate wine consumption and health	Wine within Mediterranean diet and healthy ageing
Boccardi et al., 2024	Narrative Review	Red wine and neurocognitive disorders	Biological pathways and clinical evidence
Karoly et al., 2024	Review	Alcohol and brain structure	Neuroimaging evidence of alcohol-related brain changes

Source: Authors, 2026.

Supplementary Table S6. Database search yield.

Database	Records Retrieved
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PubMed/MEDLINE	1,050
Scopus	890
Web of Science	670
PsycINFO	320
Cochrane Library	190
Total	3,120

Source: Authors, 2026.