

MODIFIABLE RISK FACTORS FOR COGNITIVE DECLINE IN ADULTS: A SCOPING REVIEW WITH EMPHASIS ON BRAZIL

FATORES DE RISCO MODIFICÁVEIS PARA O DECLÍNIO COGNITIVO EM ADULTOS: UMA REVISÃO DE ESCOPO COM ÊNFASE NO BRASIL

FACTORES DE RIESGO MODIFICABLES PARA EL DECLIVE COGNITIVO EN ADULTOS: UNA REVISIÓN DE ALCANCE CON ÉNFASIS EN BRASIL

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ABSTRACT: Population aging has been accompanied by an increase in cognitive impairment and dementia, affecting autonomy, quality of life, and health systems. Although biological factors contribute to cognitive decline, many cases are associated with modifiable factors and social conditions. This study aimed to analyze modifiable risk factors for cognitive decline in adults, emphasizing the Brazilian context and social determinants of health. This descriptive scoping review with a qualitative approach followed PRISMA-ScR recommendations and used the PCC strategy. Searches were conducted between March and April 2026 in PubMed, PubMed Central, ScienceDirect, and LILACS. Studies published in the previous five years, available in full text in Portuguese, English, or Spanish, and addressing modifiable risk factors associated with cognitive decline, cognitive impairment, or dementia in adults were included. Ten studies were selected. Cognitive decline showed a multifactorial nature, involving clinical, behavioral, psychosocial, and social factors. Low educational attainment, hypertension, diabetes mellitus, physical inactivity, depressive symptoms, and social isolation were among the main associated factors. Unfavorable socioeconomic conditions increased exposure to these factors and vulnerability to cognitive decline. Prevention should therefore address clinical and behavioral factors alongside social inequalities accumulated throughout life, reinforcing the need for integrated and equitable strategies to promote cognitive health.

Keywords: Cognitive Dysfunction. Dementia. Risk Factors.

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RESUMO: O envelhecimento populacional tem sido acompanhado pelo aumento do comprometimento cognitivo e das demências, afetando a autonomia, a qualidade de vida e os sistemas de saúde. Embora fatores biológicos contribuam para esse processo, parcela expressiva dos casos está associada a fatores modificáveis e condições sociais. Este estudo teve como objetivo analisar fatores de risco modificáveis associados ao declínio cognitivo em adultos, com ênfase no contexto brasileiro e nos determinantes sociais da saúde. Trata-se de uma revisão de escopo, descritiva e qualitativa, conduzida conforme o PRISMA-ScR, com pergunta estruturada pela estratégia PCC. As buscas foram realizadas entre março e abril de 2026 nas bases PubMed, PubMed Central, ScienceDirect e LILACS. Foram incluídos estudos dos últimos cinco anos, disponíveis na íntegra, em português, inglês ou espanhol, que abordassem fatores de risco modificáveis relacionados ao declínio cognitivo, comprometimento cognitivo ou demência em adultos. Dez estudos foram incluídos. Os resultados evidenciaram caráter multifatorial, destacando baixa escolaridade, hipertensão, diabetes mellitus, inatividade física, sintomas depressivos e isolamento social. Condições socioeconômicas desfavoráveis aumentaram a exposição a esses fatores e a vulnerabilidade ao declínio cognitivo. A prevenção deve integrar fatores clínicos e comportamentais às desigualdades sociais acumuladas ao longo da vida, promovendo estratégias equitativas de saúde cognitiva.

Palavras-chave: Disfunção Cognitiva. Demência. Fatores de Risco.

RESUMEN: El envejecimiento poblacional se ha acompañado de un aumento del deterioro cognitivo y las demencias, afectando la autonomía, la calidad de vida y los sistemas de salud. Aunque los factores biológicos contribuyen a este proceso, una proporción significativa de los casos se relaciona con factores modificables y condiciones sociales. Este estudio tuvo como objetivo analizar factores de riesgo modificables asociados con el deterioro cognitivo en adultos, con énfasis en el contexto brasileño y los determinantes sociales de la salud. Se realizó una revisión de alcance, descriptiva y cualitativa, conforme a las recomendaciones PRISMA-ScR, con una pregunta estructurada según la estrategia PCC. Las búsquedas se realizaron entre marzo y abril de 2026 en PubMed, PubMed Central, ScienceDirect y LILACS. Se incluyeron estudios de los últimos cinco años, disponibles en texto completo, en portugués, inglés o español. Diez estudios fueron incluidos. Los resultados evidenciaron un carácter multifactorial, destacando baja escolaridad, hipertensión, diabetes mellitus, inactividad física, síntomas depresivos y aislamiento social. Las condiciones socioeconómicas desfavorables aumentaron la vulnerabilidad al deterioro cognitivo. La prevención debe integrar factores clínicos, conductuales y sociales, promoviendo estrategias equitativas de salud cognitiva.

Palabras clave: Disfunción cognitiva. Demencia. Factores de Riesgo.

INTRODUCTION

Population aging is one of the main demographic changes of the 21st century and has been accompanied by an increase in noncommunicable chronic diseases and age-related neurodegenerative conditions. Among these conditions, cognitive decline stands out because it affects autonomy, functionality, quality of life, and the demand for health care. In middle-income countries, such as Brazil, this scenario becomes even more complex, as aging occurs

rapidly and amid persistent social inequalities. Therefore, identifying factors associated with cognitive decline is important for guiding prevention strategies and reducing individual, family, and collective impacts.

Cognitive decline involves the progressive worsening of functions such as memory, attention, language, and executive skills, and may precede mild cognitive impairment and dementia. Although biological and genetic factors are involved in this process, a relevant part of the risk is related to potentially modifiable conditions throughout life. In Brazil, it is estimated that approximately 59.5% of dementia cases may be attributable to preventable factors, such as low educational attainment, hypertension, sedentary behavior, diabetes mellitus, depression, untreated visual impairment, and social isolation (SUEMOTO et al., 2025). This finding reinforces that the prevention of cognitive decline does not depend only on individual clinical approaches, but also on public policies aimed at health promotion and the reduction of social vulnerabilities.

Social determinants of health play an important role in how these risk factors are distributed across the population. Low income, lower educational attainment, difficulties in accessing health services, and lower social participation may increase exposure to cardiovascular, metabolic, and psychosocial conditions associated with poorer cognitive performance. In addition, education influences the development of cognitive reserve and may act as a protective factor throughout aging. Studies with Brazilian populations indicate that lower educational levels are associated with a higher probability of cognitive impairment and poorer results in cognitive assessment tests (LUCHESE et al., 2024; PASSOS et al., 2021).

Analyses based on the Brazilian Longitudinal Study of Aging also indicate an association between subjective cognitive decline and social, behavioral, and health-related factors, including lower educational attainment, lower income, loneliness, sedentary behavior, multimorbidity, diabetes, visual impairment, hearing loss, and depressive symptoms (LOPES et al., 2026). Among clinical factors, hypertension and diabetes mellitus appear recurrently in the literature, especially when present in midlife (PASSOS et al., 2021; ALMEIDA FARIA et al., 2022). These conditions may favor cerebrovascular changes, systemic inflammation, oxidative stress, and structural brain lesions, contributing to the progression of cognitive impairment.

Behavioral and psychosocial factors also deserve attention. Physical inactivity is associated with a higher risk of dementia, whereas regular physical activity appears to have a

protective effect on different cognitive domains (DUARTE et al., 2024). Similarly, social isolation, loneliness, and social exclusion reduce opportunities for interaction, emotional support, and mental stimulation, which are important aspects for maintaining cognitive health (RODRIGUES; DELERUE-MATOS, 2025). Although these factors are often treated as individual choices, they are influenced by living conditions, access to social spaces, territorial safety, and the availability of support networks.

In Brazil, modifiable risk factors are not distributed homogeneously. Regions and population groups experiencing greater social vulnerability tend to have greater exposure to factors associated with dementia when compared with more advantaged contexts (PARADELA et al., 2024). The history of inequality in access to formal education also contributes to lower levels of cognitive reserve in part of the adult and older population (RIBEIRO et al., 2024). Thus, cognitive decline cannot be understood only as a consequence of biological aging, but also as the result of life trajectories marked by different opportunities for education, income, health care, and social participation.

Despite the growth of scientific production on factors associated with cognitive decline, there is still a need to bring this evidence together in an integrated way, especially when considering the relationship between modifiable factors and social determinants of health. Many studies analyze clinical, behavioral, or social conditions separately, which makes it difficult to achieve a broader understanding of the phenomenon and limits the development of equitable prevention strategies. Therefore, it is relevant to systematize the available evidence on modifiable risk factors associated with cognitive decline, with special attention to the Brazilian context and to the social inequalities that shape this process. Thus, this study aimed to analyze modifiable risk factors associated with cognitive decline in adults, with emphasis on the Brazilian context and on the influence of social determinants of health.

METHODS

A descriptive scoping review with a qualitative approach was conducted and reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR). The research question was structured using the PCC strategy, composed of population, concept, and context. The population corresponded to adults; the concept, to modifiable risk factors associated with cognitive decline; and the context, to social determinants of health, with emphasis on the Brazilian context. The guiding

question was: what are the modifiable risk factors associated with cognitive decline in adults, and how do social determinants of health influence these associations?

The literature searches were conducted between March and April 2026 in PubMed, PubMed Central, ScienceDirect, and Latin American and Caribbean Literature in Health Sciences (LILACS). Controlled descriptors from the Health Sciences Descriptors (DeCS) and Medical Subject Headings (MeSH) were used, in addition to free terms in Portuguese and English, combined using the Boolean operators AND and OR.

The main search strategy was: (“Cognitive Decline” OR “Cognitive Dysfunction” OR “Cognitive Impairment” OR “Dementia”) AND (“Risk Factors” OR “Hypertension” OR “Diabetes Mellitus” OR “Sedentary Lifestyle” OR “Physical Inactivity” OR “Depression” OR “Social Isolation”) AND (“Social Determinants of Health” OR “Education” OR “Income” OR “Socioeconomic Factors”) AND (“Brazil” OR “Brazilian”). The following terms in Portuguese were also used: “Declínio Cognitivo”, “Comprometimento Cognitivo”, “Demência”, “Fatores de Risco”, “Hipertensão”, “Diabetes Mellitus”, “Determinantes Sociais da Saúde”, “Estilo de Vida Sedentário”, “Inatividade Física”, “Depressão”, “Isolamento Social”, “Escolaridade”, “Renda”, and “Brasil”.

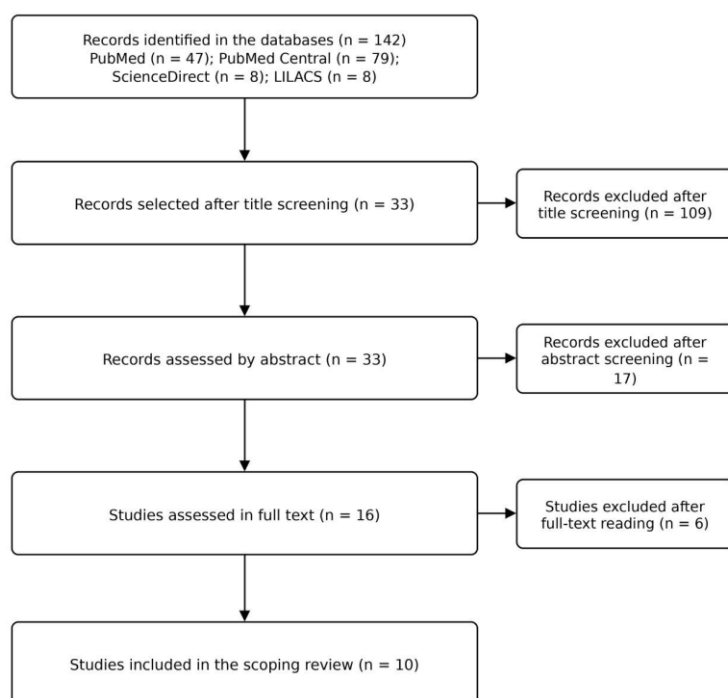
Studies published in the last five years, available in full text, in Portuguese, English, or Spanish, and addressing modifiable risk factors associated with cognitive decline, cognitive impairment, or dementia in adults were included. Studies with Brazilian populations, Latin American studies including Brazil, and international publications relevant to understanding modifiable risk factors and social determinants associated with cognitive decline were considered eligible. Observational, cross-sectional, longitudinal, and cohort studies, as well as systematic reviews and population-based analyses related to the guiding question, were also included. Editorials, letters to the editor, comments, publications without full-text access, and studies not directly related to the topic investigated were excluded. No separate duplicate removal step was recorded.

Study selection was organized into four stages: identification, screening, eligibility, and inclusion, according to a flowchart adapted from PRISMA-ScR. In the initial stage, 142 records were identified in the databases consulted: 47 in PubMed, 79 in PubMed Central, 8 in ScienceDirect, and 8 in LILACS. After title screening, 33 records were considered potentially relevant, with 109 publications excluded. The abstracts were then assessed, and 16 studies

remained for full-text reading. After complete text analysis and application of the eligibility criteria, 6 studies were excluded, resulting in 10 studies included in the review (Figure 1).

Data extraction followed a previously organized form containing author, year of publication, database, study design, population investigated, risk factors assessed, social determinants analyzed, and main findings related to cognitive decline. The information was organized in an electronic spreadsheet and analyzed descriptively and thematically. The findings were grouped into categories related to clinical, behavioral, psychosocial, and social factors.

Figure 1. Flowchart of study selection included in the scoping review, adapted from PRISMA-ScR.



Note: No separate duplicate removal step was recorded.

RESULTS

Table 1. Methodological characterization of the included studies

Author/year	Country/context	Study design	Population
Suemoto et al., 2025	Brazil; national data from ELSI-Brazil	Population-based analysis with calculation of population attributable fraction	9,949 Brazilian individuals aged 50 years or older

Luchesi et al., 2024	Brazil; Três Lagoas, Mato Grosso do Sul	Quantitative longitudinal study with two years of follow-up	200 middle-aged and older adults aged 45 years or older, registered in Primary Health Care
Passos et al., 2021	Brazil; Pró-Saúde Study, Rio de Janeiro	Cross-sectional study nested within a longitudinal cohort	488 Brazilian adults aged 35 to 64 years
Lopes et al., 2026	Brazil; national data from ELSI-Brazil, second wave 2019–2021	Population-based cross-sectional study with a nationally representative sample	6,631 Brazilian individuals aged 50 years or older
Almeida Faria et al., 2022	Brazil; tertiary hospital in Southern Brazil	Prospective observational study with baseline assessment and 12- to 24-month follow-up	251 adults with type 2 diabetes mellitus at baseline; 134 reassessed during follow-up
Duarte et al., 2024	Brazil; Alcobaça, Bahia	Cross-sectional, observational, and analytical study using isotemporal substitution analysis	473 older adults aged 60 years or older, registered in the Family Health Strategy
Rodrigues; Delerue-Matos, 2025	International; review including studies from different countries	Systematic review of longitudinal studies	Middle-aged and older adults included in 65 longitudinal studies
Paradela et al., 2024	Latin America; Argentina, Brazil, Bolivia, Chile, Honduras, Mexico, and Peru	Analysis of cross-sectional data from nationally representative surveys, with calculation of population attributable fraction	Adults aged 18 years or older included in national databases from the seven countries
Ribeiro et al., 2024	Brazil; São Paulo; SABE Study	Population-based longitudinal study with 15 years of follow-up and cognitive trajectory modeling	354 Brazilian older adults aged 60 years or older
Ahmad et al., 2022	International; narrative review without a specific country focus	Narrative literature review	No original study population; includes human studies, animal studies, and mechanistic evidence

Note: ELSI-Brazil: Brazilian Longitudinal Study of Aging; SABE: Health, Well-being, and Aging Study. The country/context classification considered the origin of the data analyzed. International studies were retained when they contributed to understanding modifiable risk factors or mechanisms related to cognitive decline.

Source: Prepared by the authors based on the studies included in the review.

The analysis of the selected studies showed that cognitive decline in adults has a multifactorial nature, involving the interaction between clinical conditions, health behaviors, psychosocial aspects, and social determinants of health. The included studies addressed Brazilian populations, Latin American evidence including Brazil, and international studies

focused on understanding mechanisms and social conditions related to cognitive impairment (Table 1).

In the Brazilian context, it was estimated that 59.5% of dementia cases could be attributed to 14 modifiable risk factors, a percentage higher than previously reported global estimates. Among these factors, low educational attainment showed the highest population attributable fraction, followed by untreated visual impairment and midlife depression. In addition, an important proportion of attributable cases was concentrated in factors present in midlife, reinforcing the relevance of preventive interventions before old age (SUEMOTO et al., 2025).

Social determinants were strongly related to cognitive performance. Low educational attainment was recurrently identified as one of the main factors associated with cognitive decline and dementia, due to its relationship with lower cognitive reserve, reduced brain compensatory capacity, and lower access to information, opportunities, and health services (SUEMOTO et al., 2025; LUCHESI et al., 2024; PASSOS et al., 2021). In a study with middle-aged Brazilian adults, higher levels of education were associated with better cognitive performance, with increases in cognitive test scores ranging from 8% to 14% (PASSOS et al., 2021). Similarly, a Brazilian longitudinal study with 15 years of follow-up highlighted that low educational attainment remains an important marker of cognitive vulnerability in aging (RIBEIRO et al., 2024).

Cardiovascular and metabolic conditions also appeared among the main clinical factors related to poorer cognitive performance. In studies with Brazilian populations, hypertension was associated with cognitive changes, especially among middle-aged adults and people with type 2 diabetes mellitus (PASSOS et al., 2021; ALMEIDA FARIA et al., 2022). Evidence indicates that hypertension may contribute to cerebrovascular changes, small vessel disease, stroke, and a higher risk of mild cognitive impairment and dementia (PASSOS et al., 2021; ALMEIDA FARIA et al., 2022) (Table 2).

Diabetes mellitus also stood out among the factors associated with poorer cognitive performance. Brazilian studies showed a relationship between type 2 diabetes and poorer performance in executive functions and verbal language (PASSOS et al., 2021; ALMEIDA FARIA et al., 2022). In addition, longer diabetes duration, especially when associated with hypertension, depressive symptoms, cardiovascular disease, and diabetic retinopathy, was related to poorer cognitive performance during follow-up (ALMEIDA FARIA et al., 2022).

International evidence helps explain these findings by describing mechanisms such as chronic hyperglycemia, cerebral insulin resistance, systemic inflammation, oxidative stress, and the formation of advanced glycation end products, processes related to neurodegeneration and increased risk of Alzheimer's disease and vascular dementia (AHMAD et al., 2022).

Among behavioral factors, physical inactivity appeared as a relevant modifiable factor, whereas physical activity was related to better cognitive health (DUARTE et al., 2024). In a Brazilian study with older adults, leisure-time physical activity showed a protective effect against cognitive decline when replacing sedentary behavior, sleep, or transport time. The reverse substitution, with reduced time allocated to leisure-time physical activity, was considered a risk factor for cognitive decline (DUARTE et al., 2024).

Regarding mental health, depressive symptoms were frequently associated with cognitive decline. In a Brazilian longitudinal study, depressive symptoms at baseline were identified as predictors of cognitive decline after two years of follow-up (LUCESI et al., 2024). In patients with type 2 diabetes, depressive symptoms were also associated with poorer cognitive performance at baseline and during follow-up (ALMEIDA FARIA et al., 2022). These results indicate that mental health care should be considered in strategies to prevent cognitive impairment and dementia (SUEMOTO et al., 2025; LUCESI et al., 2024; ALMEIDA FARIA et al., 2022).

Social isolation, loneliness, and social exclusion were also related to poorer cognitive health. In a national study using ELSI-Brazil data, subjective cognitive decline was associated with lower educational attainment, lower income, non-white race/skin color, loneliness, sedentary behavior, multimorbidity, diabetes, visual impairment, hearing loss, and depressive symptoms (LOPES et al., 2026). An international systematic review indicated that economic exclusion, loneliness, social isolation, smaller social networks, less contact with family and friends, and lower participation in activities are associated with poorer cognitive health in middle-aged and older adults (RODRIGUES; DELERUE-MATOS, 2025).

Other modifiable factors identified in the included studies included obesity, smoking, excessive alcohol consumption, hearing loss, visual impairment, traumatic brain injury, and air pollution (SUEMOTO et al., 2025; PARADELA et al., 2024). In a Latin American analysis that included Brazil, the population attributable fraction for dementia was 54.0% in Latin America and 48.2% in Brazil. In Latin America as a whole, the factors with the greatest

contribution were obesity, physical inactivity, and depression; in Brazil, low educational attainment, hypertension, and hearing loss stood out (PARADELA et al., 2024).

Overall, the results show that cognitive decline in adults results from the interaction between biological, cardiovascular, metabolic, behavioral, emotional, and socioeconomic factors. Considering the emphasis on the Brazilian context, the studies suggest that interventions aimed at expanding access to education, promoting physical activity, controlling hypertension and diabetes, strengthening mental health care, addressing sensory impairments, and reducing social inequalities may contribute to preventing or delaying cognitive impairment and dementia.

Table 2. Risk factors analyzed, social determinants, and main findings

Author/year	Factor analyzed	Social determinants considered	Main findings
Suemoto et al., 2025	Fourteen modifiable factors for dementia, including low educational attainment, hypertension, diabetes, depression, physical inactivity, social isolation, hearing loss, and visual impairment	Educational attainment, sex, race/skin color, and Brazilian macro-regions	It was estimated that 59.5% of dementia cases in Brazil could be attributed to modifiable factors. Low educational attainment, untreated visual impairment, and midlife depression showed the greatest contribution.
Luchesi et al., 2024	Modifiable factors for dementia, such as hypertension, diabetes, obesity, physical inactivity, depressive symptoms, and social isolation	Educational attainment, income, sex, age, marital status, and link with Primary Health Care	The prevalence of hypertension, physical inactivity, and cognitive decline increased during follow-up. Depressive symptoms at baseline were predictors of cognitive decline after two years.
Passos et al., 2021	Hypertension, diabetes mellitus, physical activity, smoking, alcohol consumption, age, and educational attainment	Educational attainment, age, sex, and Brazilian social context	Lower educational attainment, older age, hypertension, and diabetes were associated with poorer cognitive performance. Physical activity showed an inverse association with poorer cognitive performance.
Lopes et al., 2026	Subjective cognitive decline and associated factors, including educational attainment, income, race/skin color, loneliness, sedentary behavior, multimorbidity, diabetes, visual	Educational attainment, income, race/skin color, loneliness, physical activity, and multimorbidity	The prevalence of subjective cognitive decline was 19.7%. Higher odds were associated with lower educational attainment, lower income, non-white race/skin color, loneliness, sedentary behavior, multimorbidity, diabetes, visual impairment,

	impairment, hearing loss, and depressive symptoms		hearing loss, and depressive symptoms.
Almeida Faria et al., 2022	Cognitive decline in patients with type 2 diabetes; duration of diabetes, hypertension, depressive symptoms, cardiovascular disease, and diabetic retinopathy	Educational attainment, age, race/skin color, marital status, and lifestyle habits	Poorer cognitive performance was associated with low educational attainment, hypertension, depressive symptoms, diabetic retinopathy, longer duration of diabetes, and cardiovascular disease. The study recommends incorporating cognitive assessment into the routine care of patients with type 2 diabetes.
Duarte et al., 2024	Physical activity, sedentary behavior, sleep, and physical activity domains: leisure, work, transport, and household activities	Sex, age group, marital status, family arrangement, hospitalization, depressive symptoms, frailty, and participation in leisure-time activities	Leisure-time physical activity was a protective factor against cognitive decline when replacing sedentary behavior, sleep, and transport time. The reverse substitution was considered a risk factor.
Rodrigues; Delerue-Matos, 2025	Social exclusion and cognitive health, considering economic exclusion, social relations, and civic participation	Poverty, material deprivation, income, wealth, loneliness, social isolation, social networks, family contact, and civic participation	Economic exclusion, loneliness, social isolation, smaller social networks, and lower participation in activities were associated with poorer cognitive health. Evidence regarding civic participation was mixed.
Paradela et al., 2024	Twelve modifiable factors for dementia, including low educational attainment, hypertension, obesity, depression, social isolation, physical inactivity, diabetes, and air pollution	Educational attainment, social isolation, regional socioeconomic conditions, urbanization/air pollution, and inequalities in access to health care	The population attributable fraction for dementia was 54.0% in Latin America and 48.2% in Brazil. In Latin America as a whole, the factors with the greatest contribution were obesity, physical inactivity, and depression; in Brazil, low educational attainment, hypertension, and hearing loss stood out.
Ribeiro et al., 2024	Cognitive decline trajectories and risk/protective factors among older adults with low educational attainment	Educational attainment, income, self-identified race/skin color, rural residence during childhood, widowhood, manual/artistic activities, and socioeconomic conditions	Stable, declining, and strongly declining cognitive trajectories were identified. The stable trajectory was associated with better socioeconomic conditions, white race/skin color, and manual/artistic activities. The greatest decline was associated with black or mixed race/skin color,

			smoking, and greater social vulnerability.
Ahmad et al., 2022	Diabetes mellitus, especially type 2 diabetes, and its relationship with cognitive decline, vascular dementia, and Alzheimer's disease	Does not address social determinants as a central axis; mentions age, educational attainment, ethnicity, depression, and duration of diabetes as variables related to risk	Type 2 diabetes was associated with a higher risk of cognitive impairment, vascular dementia, and Alzheimer's disease. The mechanisms discussed include hyperglycemia, insulin resistance, inflammation, oxidative stress, vascular injury, blood-brain barrier dysfunction, beta-amyloid, and tau protein.

Note: The table presents the clinical, behavioral, psychosocial, and social factors analyzed in the included studies, as well as the social determinants considered and the main findings related to cognitive decline, cognitive impairment, or dementia. International and Latin American studies were used to complement the understanding of modifiable factors and social determinants, while maintaining the interpretive emphasis on the Brazilian context.

Source: Prepared by the authors based on the studies included in the review.

DISCUSSION

The findings of this scoping review indicate that cognitive decline in adults, with emphasis on the Brazilian context, cannot be explained by a single factor. The evidence gathered shows a combination of clinical conditions, health behaviors, psychosocial aspects, and social inequalities accumulated throughout life. From this perspective, hypertension, diabetes mellitus, physical inactivity, depressive symptoms, and social isolation are associated with poorer cognitive performance, especially when shaped by low educational attainment, lower income, and unequal access to health services (SUEMOTO et al., 2025; LUCHESI et al., 2024; PASSOS et al., 2021; ALMEIDA FARIA et al., 2022; RODRIGUES; DELERUE-MATOS, 2025).

Low educational attainment was one of the most relevant factors among the studies analyzed. Brazilian evidence indicates that individuals with lower educational levels are more vulnerable to cognitive impairment and dementia, whereas higher educational levels are associated with better performance on cognitive tests and greater cognitive reserve (SUEMOTO et al., 2025; PASSOS et al., 2021; LOPES et al., 2026; RIBEIRO et al., 2024). This finding is important because education does not act only as an individual variable. It reflects inequalities accumulated since the early stages of life and influences work opportunities, income, access to information, use of health services, and the adoption of protective practices.

Cardiovascular and metabolic conditions also played a central role in the included studies. In studies with Brazilian populations, hypertension and diabetes mellitus were associated with poorer cognitive performance (PASSOS et al., 2021; ALMEIDA FARIA et al., 2022). These conditions may contribute to cerebrovascular changes, systemic inflammation, oxidative stress, insulin resistance, and brain lesions related to cognitive decline (PASSOS et al., 2021; ALMEIDA FARIA et al., 2022; AHMAD et al., 2022). However, the presence of these diseases also reflects social inequalities, since late diagnosis, irregular follow-up, and difficulties in clinical control tend to be more frequent among socially vulnerable groups.

Physical activity appeared as a relevant behavioral factor for preserving cognitive health. The Brazilian study included in this review indicated that leisure-time physical activity may have a protective effect against cognitive decline (DUARTE et al., 2024). This result broadens the discussion beyond the individual recommendation to “practice physical activity”, since the possibility of maintaining an active routine depends on concrete conditions such as neighborhood safety, availability of public spaces, free time, income, access to health promotion programs, and social support.

Psychosocial factors also help explain the relationship between inequality and cognitive decline. Depressive symptoms and social isolation were associated with a higher risk of cognitive impairment and dementia (SUEMOTO et al., 2025; LUCHESI et al., 2024; RODRIGUES; DELERUE-MATOS, 2025). Depression may act either as a risk factor or as an early manifestation of neurodegenerative processes, which makes it difficult to establish a single causal relationship. Social isolation and social exclusion, in turn, reduce opportunities for interaction, emotional support, and cognitive stimulation. In the Brazilian context, this point deserves attention because family and community networks may act as protective factors, but they may also be weakened by urbanization, migration, poverty, declining fertility, and limited institutional support.

The evidence gathered indicates that modifiable risk factors for cognitive decline are influenced by socioeconomic and regional inequalities. In Brazil and other Latin American countries, more vulnerable groups tend to have greater exposure to low educational attainment, sedentary behavior, hypertension, diabetes, depressive symptoms, and limited access to health services (SUEMOTO et al., 2025; PARADELA et al., 2024). Thus, cognitive decline should not be understood only as a consequence of biological aging, but also as the result of life

trajectories marked by different opportunities for education, income, care, social participation, and health protection.

Another relevant aspect concerns sensory impairments, especially hearing loss and visual impairment. These factors appeared among the elements associated with dementia in Brazilian and Latin American studies (SUEMOTO et al., 2025; LOPES et al., 2026; PARADELA et al., 2024). In addition to being potentially modifiable, they are directly related to access to diagnosis, treatment, rehabilitation, and follow-up care. When untreated, sensory impairments may reduce communication, autonomy, and social participation, indirectly contributing to isolation and poorer cognitive health.

Among the limitations of this review, the methodological heterogeneity of the included studies should be highlighted, with a predominance of observational designs, which limits causal inferences. In addition, the studies used different forms of cognitive assessment and included varied populations, such as middle-aged adults, older adults, people with type 2 diabetes, and population-based samples. Another limitation refers to the restriction to the last five years and the inclusion only of studies available in full text, which may have reduced the number of eligible publications. The presence of international and Latin American studies in the sample should also be considered, as these were used to broaden the understanding of modifiable factors and social determinants, although the article maintains an emphasis on the Brazilian context.

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Despite these limitations, this review brought together recent evidence on modifiable factors related to cognitive decline and showed that prevention must go beyond individual clinical control. In the Brazilian context, strategies aimed at expanding access to education, promoting physical activity, controlling hypertension and diabetes, strengthening mental health care, reducing social isolation, addressing sensory impairments, and tackling inequalities may contribute to delaying cognitive impairment and reducing the burden of dementia.

CONCLUSION

This scoping review analyzed modifiable risk factors associated with cognitive decline in adults, with emphasis on the Brazilian context and on the influence of social determinants of health. The findings indicate that low educational attainment, hypertension, diabetes mellitus, physical inactivity, depressive symptoms, social isolation, and sensory impairments

are related to cognitive impairment and are influenced by the social and economic conditions experienced throughout life.

The synthesis of the evidence shows that cognitive decline does not result only from biological changes associated with aging, but from an interaction between clinical, behavioral, psychosocial, and social factors. In the Brazilian context, this relationship becomes particularly relevant in view of inequalities in access to education, health services, income, social participation, and prevention opportunities.

Thus, the prevention of cognitive impairment should go beyond the individual control of chronic diseases. The results point to the need for strategies that combine health promotion, expanded access to education, encouragement of physical activity, mental health care, screening and management of sensory impairments, strengthening of support networks, and reduction of social inequalities, contributing to more equitable actions for the protection of cognitive health.

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