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COGNITIVE IMPAIREMENT AND DEMENTIA SCREENING AMONG OLDER ADULTS IN SAUDI ARABIA: A SYSTEMIC REVIEW

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Abstract:

Background: *As Saudi Arabia undergoes a rapid demographic transition driven by socio-economic development and extended life expectancy, the proportion of older adults is projected to increase to 25% by 2050. This shift is accompanied by an escalating burden of neurodegenerative conditions, notably, Mild cognitive impairment (MCI) and dementia. Early detection through validated, screening tools is essential for timely clinical intervention and assess allocation.*

Objective: *to systematically review existing literature on the prevalence, screening, methodologist, diagnostic accuracy, and risk factors associated with cooperative impairment and dementia among older adults (≥60 years) in Saudi Arabia.*

Methods: *a systematic literature search was executed across PubMed, Scopus, Web of sciences, and Google scholar following PRISMA guidelines. Studies published up to 2026, assessing cognitive screening, prevalence, rates, or associated cardio metabolic/demographic practices in Saudi Arabia, where evaluated.*

Results: *A total of 14 studies meeting, inclusion criteria synthesised. Prevalence of overall cognitive impairment, community dwelling older adults range from 21.0% to 45.0%, depending on screening tool, sensitivity and educational adjustments. Mild cognitive impairment (MCI) prevalence varied between 17.1% and 36.6%, while primary Care dementia rates ranged from 3.8% to 16.6%. The Mini-Mental State Examination (MMSE), Montreal Cognitive Assessment (MoCA), and Eight-Item Informant Interview (AD8) were the predominant tools. Major predictors of cognitive decline included advanced age, female gender, low literacy/formal education, and high cardiometabolic burden (type 2 diabetes, hypertension, and dyslipidaemia).*

Conclusion: *Cognitive impairment is a prevalent yet substantially underdiagnosed condition in Saudi Arabia. Widespread adoption of educationally adjusted and culturally adopted screening instruments in primary healthcare is urgently required. .*

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1. INTRODUCTION:

The Kingdom of Saudi Arabia is experiencing a profound demographic transformation. Advances in healthcare infrastructure, expanded preventive care programs, and improved socio-economic conditions have elevated the national average life expectancy from 74 to over 82 years. Consequently, the segment of the population aged 60 years and older —which accounted for approximately 5.6% of the population in 2017—is projected to reach nearly 25% by 2050. While this demographic shift reflects major public health achievements, it simultaneously introduces challenges associated with age-related non-communicable diseases. Among these, neurodegenerative disorders—specifically Mild Cognitive Impairment (MCI) and major neurocognitive disorders (dementia)—represent significant sources of disability, healthcare utilization, and caregiver burden. Globally, over 55 million people live with dementia, and the Middle East and North Africa (MENA) region is projected to experience one of the steepest percentage increases in dementia burden over the next three decades.

Cognitive decline exists along a continuum, extending from age-normal cognitive changes to MCI and advanced dementia. MCI represents a critical clinical transition state wherein objective cognitive deficits exceed age-expected norms without disrupting functional independence in basic activities of daily living (ADLs). Identifying individuals at the MCI stage provides a crucial window for secondary prevention, intensive cardiometabolic control, and lifestyle modification to slow disease progression.

Clinical Context in Saudi Primary Care

- Cognitive screening among older adults in Saudi Arabia is uniquely shaped by two primary factors: Educational Heterogeneity: Historical differences in formal education availability mean older cohorts exhibit high rates of illiteracy or limited schooling, particularly among older women. Standard tools (MMSE, MoCA) can yield false-positive results if not educationally adjusted.
- Cardiometabolic Comorbidities: Exceptionally high national rates of Type 2 Diabetes Mellitus (>25%), Hypertension (>30%), and metabolic syndrome significantly increase the risk for vascular cognitive impairment and mixed dementia.

2. METHODS:

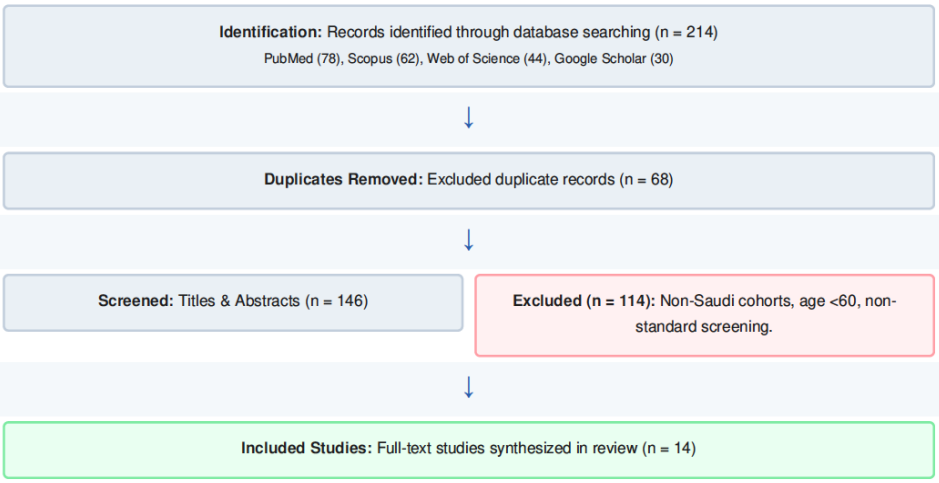
This systematic review adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement guidelines.

2.1 Search Strategy & Eligibility Criteria

Comprehensive literature searches were conducted across PubMed/MEDLINE, Scopus, Web of Science, and Google Scholar through 2026. Search strings combined MeSH terms and keywords: ("Cognitive Impairment" OR "Mild Cognitive Impairment" OR "MCI" OR "Dementia" OR "Alzheimer") AND ("Screening" OR "Assessment" OR "MMSE" OR "MoCA") AND ("Saudi Arabia" OR "KSA").

Eligible studies were observational cross-sectional or cohort designs involving Saudi community-dwelling or primary healthcare center (PHCC) patients aged ≥60 years, using validated Arabic cognitive instruments, and reporting prevalence or risk factor data. Case reports, editorials, and non-quantitative surveys were excluded.

Figure 1: PRISMA Flow Diagram of Study Selection



3. RESULTS:

Fourteen studies satisfied all systematic review criteria. These studies evaluated community-dwelling cohorts and patients visiting Primary Healthcare Centers (PHCCs) across major metropolitan areas including Riyadh, Jeddah, and the Eastern Province.

Table 1: Key Characteristics and Findings of Primary Included Studies

Study / Location	Sample (N)	Mean Age	Screening Instrument	Cognitive Impairment / MCI Rate	Dementia Prevalence	Key Findings & Observations
Al-Jahdali et al. (Riyadh Community)	171	67.0 ± 6.0	Arabic MoCA	45.0% Total (38.6% MCI)	6.4%	High sensitivity to education; raw scores heavily skewed by literacy rates. Cut-off adjustment required.
Al-Qarni et al. (Riyadh PHCCs)	1,299	66.2 ± 5.9	Arabic MMSE	20.9% Total (17.1% MCI)	3.8%	Largest PHCC sample. Illiteracy strongly predicted low MMSE scores (OR = 3.4).
Al-Hussain et al. (Central Region PHCCs)	379	68.2 ± 6.4	Arabic AD8 (Informant)	N/A	11.3% - 16.6%	Used informant report; effectively removed participant literacy bias. High correlation with caregiver burden.
National Disability Survey (Saudi Arabia)	National	All Ages	Self-Reported Function	1.1% Population	N/A	Population-wide self-report underrepresents subclinical cognitive impairment compared to clinical screening.

3.1 Screening Tool Performance and Cultural Adaptations

The review identified three major standardized tools routinely utilized or evaluated in Saudi Arabian clinical settings:

- **Mini-Mental State Examination (MMSE):** Most widely adopted tool in primary care due to familiarity and brief administration (5-10 minutes). However, unadjusted cut-offs (<24) result in high false-positive rates among uneducated older adults. Modified Arabic versions incorporating literacy adjustments demonstrate improved specificity.
- **Montreal Cognitive Assessment (MoCA):** Highly sensitive for detecting early MCI and executive dysfunction. Because items require reading, drawing, and abstract processing, education-

stratified cut-off scores (e.g., <14 for illiterate individuals, <20 for primary education, <25 for higher education) are essential.

- **Eight-item Informant Interview (AD8):** Administered to a family caregiver or close contact. It bypasses participant literacy limitations entirely and demonstrates high sensitivity for identifying functional cognitive decline in primary care.

3.2 Predictors and Comorbid Risk Factors

Multivariable regression analyses across the included studies demonstrated consistent socio-demographic and clinical risk factors associated with cognitive impairment:

- **Advanced Age:** Each additional decade of age was associated with a 1.8 to 2.5-fold increase in cognitive impairment odds ($p < 0.001$).
- **Educational Attainment:** Illiteracy or lack of formal schooling was the single strongest socio-demographic predictor (OR range: 2.5 – 4.2).
- **Cardiometabolic Disease:** Type 2 Diabetes Mellitus (OR: 1.8 - 2.4), Hypertension (OR: 1.6 - 2.1), and hypercholesterolemia were independently associated with impaired cognitive status.
- **Female Sex:** Higher raw rates of impairment were observed in females, heavily moderated by historical literacy gaps and higher rates of physical inactivity.

4. DISCUSSION:

This systematic review demonstrates that cognitive impairment and dementia represent substantial public health challenges in Saudi Arabia. Reported community-based cognitive impairment rates (21.0% to 45.0%) are higher than those reported in Western cohorts of similar age, primarily reflecting the heavy regional burden of cardiometabolic risk factors combined with high rates of lower formal educational attainment among current older cohorts.

A central finding of this synthesis is the critical necessity of using education-adjusted and culturally adapted screening tools. Standard cognitive tests heavily emphasize literacy-dependent skills such as reading, writing, and visuospatial drafting. When applied without education-specific thresholds, these tools risk misclassifying cognitive health, leading to inappropriate clinical referrals and patient anxiety.

Furthermore, the prominent role of vascular risk factors—specifically diabetes and hypertension—indicates that vascular cognitive impairment (VCI) and mixed Alzheimer-vascular dementia form a primary pathophysiological pathway in Saudi Arabia. Aggressive management of blood glucose, blood pressure, and lipid profiles in midlife and late-life represents a vital strategy for primary and secondary prevention of cognitive decline.

Strategic Health System Recommendations

- **Standardized Primary Care Screening:** Integrate routine, education-adjusted cognitive screening (e.g., Arabic MoCABasic or RUDAS) into routine health assessments for adults aged ≥65 years.
- **Incorporate Informant Tools:** Utilize the AD8 or IQCODE as first-line tools in primary care settings when evaluating patients with limited formal education.
- **Multidisciplinary Care Pathways:** Establish clear referral pathways connecting PHCCs with secondary/tertiary memory clinics and geriatric medicine services.
- **Community Awareness & Stigma Reduction:** Implement national public education campaigns emphasizing that cognitive decline is a medical condition requiring early evaluation, rather than an inevitable part of normal aging.

5. CONCLUSION

Cognitive impairment and dementia represent pressing health priorities for Saudi Arabia's rapidly aging population. Improving early detection through culturally validated, education-adjusted screening instruments in primary healthcare centers is essential. Addressing vascular risk factors through integrated chronic disease management provides an actionable pathway to reduce the incidence and burden of neurodegenerative diseases in the Kingdom.

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