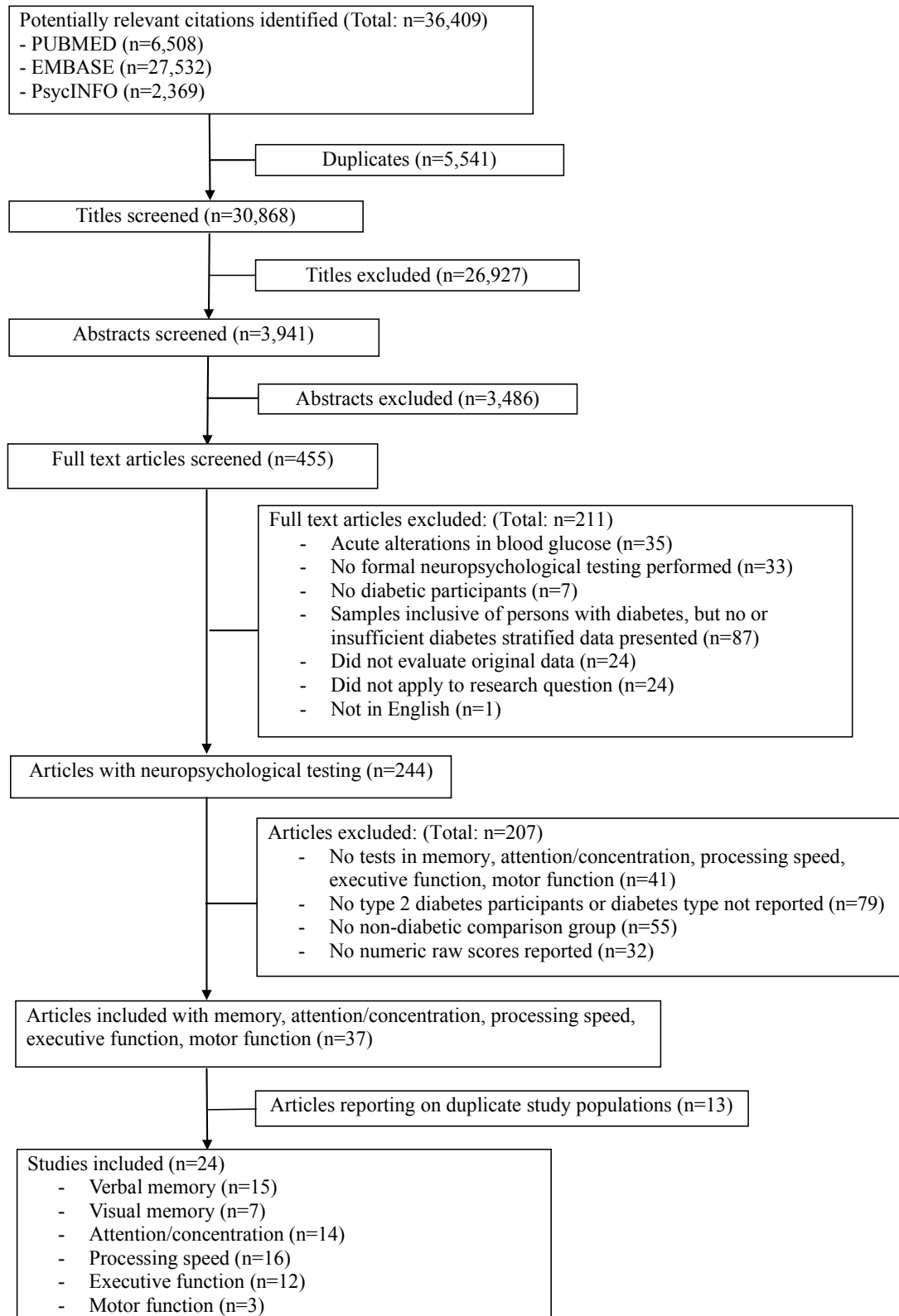


Supplemental Information A: Flow chart of study selection for inclusion.



Supplemental Information B: Quality Assessment of Included Studies Based on STROBE Guidelines

Study	Clear Participant Eligibility, Sources, and Selection Methods	Ascertainment of Diabetes using Measurement other than Self-Report	Diabetes as Primary Exposure	Control for Potential Confounders by Exclusion or Statistical Adjustment				
				Age	Sex	Education	Pre-Morbid IQ	Race
Alosco et al. 2013	Y	Y ^b	Y	Y ^d	Y ^d	N	N	N
Atiea et al. 1995	Y	Y ^a	Y	N	N	N	Y ^d	N
Brands et al. 2007	Y	N	Y	Y ^{d,e}	Y ^d	Y ^e	Y ^d	N
Christman et al. 2010	Y	Y ^b	Y	Y ^d	Y ^d	Y ^d	N	Y ^d
Espeland et al. 2011	Y	N	Y	Y ^d	Y ^d	Y ^d	N	Y ^d
Gold et al. 2007	Y	Y ^a	N	Y ^e	Y ^e	Y ^e	Y	N
Hassing et al. 2004	Y	Y ^b	Y	Y ^d	Y ^d	Y ^d	N	N
Helkala et al. 1995	Y	Y ^a	Y	N	N	N	N	N
Hugenschmidt et al. 2013	Y	Y ^a	Y	Y ^d	Y ^d	Y ^d	N	N
Koekkoek et al. 2012	Y	Y ^a	N	Y ^e	Y ^e	Y ^e	Y ^d	N
Kumar et al. 2008	Y	Y ^{b,c}	Y	N	N	Y ^d	N	N
Lindeman et al. 2001	N	Y ^a	N	Y ^d	Y ^d	Y ^d	N	Y ^d
Logroscino et al. 2004	Y	N	Y	Y ^d	Y ^e	Y ^d	N	N

Mogi et al. 2004	Y	Y ^a	Y	N	N	N	N	N
Mussell et al. 2004	Y	Y ^a	N	Y ^e	Y ^e	Y ^e	Y ^e	N
Reijmer et al. 2013	N	Y ^{a,c}	Y	Y ^{d,e}	Y ^{d,e}	Y ^e	Y ^d	N
Ryan et al. 2000	Y	Y ^b	Y	Y ^{d,e}	Y ^{d,e}	N	Y ^d	Y ^d
Takeuchi et al. 2012	N	Y ^a	Y	Y ^{d,e}	Y ^{d,e}	Y ^{d,e}	N	N
Toro et al. 2009	Y	Y ^{a,b}	Y	N	N	Y ^d	N	N
Vanahan et al. 1996	Y	Y ^a	Y	N	N	Y ^d	N	N
van den Berg et al. 2006	Y	Y ^{a,b,c}	Y	Y ^e	Y ^d	Y ^d	N	N
van den Berg et al. 2008	Y	Y ^{a,c}	Y	Y ^{d,e}	Y ^{d,e}	N	Y ^{d,e}	N
van Harten et al. 2007	Y	Y ^a	Y	Y ^{d,e}	Y ^d	Y ^d	N	N
Watari et al. 2006	Y	Y ^a	N	Y ^d	N	Y ^d	N	N

STROBE= Strengthening the Reporting of Observational Studies in Epidemiology. N= no, study did not meet that criterion. Y=yes, study did meet that criterion.

^a Diabetes ascertainment through blood test

^b Diabetes ascertainment through medical record extraction

^c Diabetes ascertainment through prescribed medications

^d Control for potential confounders through statistical adjustment

^eControl for potential confounders through matched controls

Supplemental Information C: Electronic Search Strategy

The following search strategy was used to search PubMed (MEDLINE):

("Diabetes Mellitus, Type 1"[Mesh:noexp] OR "Diabetes Mellitus, Type 2"[Mesh:noexp] OR "Type 1 Diabetes"[All Fields] OR "Type 1 Diabetes Mellitus"[All Fields] OR "Type 2 Diabetes"[All Fields] OR "Type 2 Diabetes Mellitus"[All Fields] OR "Diabetes Mellitus"[All Fields] OR "Diagnosed Diabetes"[All Fields] OR "Diabetes"[all fields])

AND

("Mental Processes"[Mesh]¹ OR "mental processes"[all fields] OR "Cognitive Function"[All Fields] OR "cognitive dysfunction"[all fields] OR "cognitive impairment"[all fields] OR "cognitive decrement"[all fields] OR "Cognition"[all fields] OR "neuropsychology"[Mesh] OR "neuropsychology"[all fields] OR "neuropsychological function"[all fields] OR "memory"[Mesh] OR "working memory"[all fields] OR "processing speed"[all fields] OR "fluency"[all fields] OR "crystallized intelligence"[all fields] OR "fluid intelligence"[all fields] OR "verbal memory"[all fields] OR "visual memory"[all fields] OR "executive function"[all fields] OR "mild cognitive impairment"[All Fields] OR "cognitive impairment no dementia"[All Fields] OR "MCI"[All Fields] OR "CIND"[All Fields] OR "abstract reasoning"[all fields] OR "psychomotor performance"[Mesh] OR "psychomotor performance"[all fields] OR "motor performance"[all fields] OR "psychomotor speed"[all fields] OR "attention"[Mesh] OR "attention"[all fields] OR "visuospatial processing"[all fields] OR "information processing"[all fields] OR "intelligence"[Mesh] OR "intelligence"[all fields] OR "spatial"[all fields] OR "visuoconstruction"[all fields] OR "visuo-construction"[all fields] OR "construction"[all fields] OR "concept formation"[all fields] OR "mental flexibility"[all fields] OR "reasoning"[all fields] OR "mental status"[all fields] OR "mini mental status exam"[all fields] OR "blessed test"[all fields] OR "dementia rating scale"[all fields])

The following search strategy was used to search EMBASE:

('insulin dependent diabetes mellitus'/exp OR 'insulin dependent diabetes mellitus' OR 'non insulin dependent diabetes mellitus'/exp OR 'non insulin dependent diabetes mellitus' OR 'type 2 diabetes' OR 'type 2 diabetes mellitus' OR 'type 1 diabetes' OR 'type 1 diabetes mellitus' OR 'diabetes mellitus'/exp OR 'diabetes mellitus' OR 'diabetes')

AND

('mental function'/exp OR 'mental function' OR 'mental processes' OR 'cognitive function' OR 'cognition'/exp OR 'cognition' OR 'cognitive impairment' OR 'cognitive defect'/exp OR 'cognitive defect' OR 'cognitive decrement' OR 'neuropsychology'/exp OR 'neuropsychology' OR 'neuropsychological function' OR 'memory'/exp OR 'memory' OR 'working memory'/exp OR 'working memory' OR 'processing speed' OR 'fluency' OR 'crystallized intelligence' OR 'fluid intelligence' OR 'verbal memory'/exp OR 'verbal memory' OR 'visual memory'/exp OR 'visual memory' OR 'executive function' OR 'mild cognitive impairment' OR 'cognitive impairment no dementia' OR 'mci' OR 'cind' OR 'abstract reasoning' OR 'psychomotor performance'/exp OR 'psychomotor performance' OR 'motor performance'/exp OR 'motor performance' OR 'psychomotor speed' OR 'attention'/exp OR 'attention' OR 'visuospatial processing' OR 'information processing'/exp OR 'information processing' OR 'intelligence'/exp OR 'intelligence' OR 'spatial' OR 'visuoconstruction' OR 'visuo-construction' OR 'construction' OR 'concept

formation'/exp OR 'concept formation' OR 'mental flexibility' OR 'reasoning' OR 'mental health'/exp OR 'mental health' OR 'mental status' OR 'mini mental status exam' OR 'blessed test' OR 'dementia rating scale')

The following search strategy was used to search PsychINFO:

('insulin dependent diabetes mellitus' OR 'non insulin dependent diabetes mellitus' OR 'type 2 diabetes' OR 'type 2 diabetes mellitus' OR 'type 1 diabetes' OR 'type 1 diabetes mellitus' OR 'diabetes mellitus' OR 'diabetes')

AND

('mental function' OR 'mental processes' OR 'cognitive function' OR 'cognition' OR 'cognitive impairment' OR 'cognitive defect' OR 'cognitive decrement' OR 'neuropsychology' OR 'neuropsychological function' OR 'memory' OR 'working memory' OR 'processing speed' OR 'fluency' OR 'crystallized intelligence' OR 'fluid intelligence' OR 'verbal memory' OR 'visual memory' OR 'executive function' OR 'mild cognitive impairment' OR 'cognitive impairment no dementia' OR 'mci' OR 'cind' OR 'abstract reasoning' OR 'psychomotor performance' OR 'motor performance' OR 'psychomotor speed' OR 'attention' OR 'visuospatial processing' OR 'information processing' OR 'intelligence' OR 'spatial' OR 'visuoconstruction' OR 'visuoconstruction' OR 'construction' OR 'concept formation' OR 'mental flexibility' OR 'reasoning' OR 'mental health'/exp OR 'mental health' OR 'mental status' OR 'mini mental status exam' OR 'blessed test' OR 'dementia rating scale')

Supplemental Information D: Data Abstraction Fields

General Information

- Reviewer initials
- Date of data abstraction
- Study first author
- Study publication year
- Study title
- Inclusion criteria
- Exclusion criteria
- Study design (cross-sectional; prospective cohort; randomized controlled trial; case-control)

Quality Assessment

- Population source (community; clinic)
- Diabetes ascertainment (blood test; medical record/medication use; self report)
- Cognitive performance reporting (raw individual test scores; standardized individual test scores; z-score for domain; not stated)
- Cognitive impairment determination (normative data provided for standardized tests; demographically adjusted normative data provided for standardized tests; control group comparison; not reported)
- Medical outcome ascertainment (blood test; not reported)
- Diabetes evaluated as (primary exposure; one of multiple prognostic factors)
- Statistical analysis (unadjusted models; adjusted for age; adjusted for age, education; adjusted for age, education, hypertension; not stated)

Participants

- Total sample size
- Diabetes group sample size
- No diabetes group sample size
- Mean/SD age diabetes group
- Mean/SD age no diabetes group
- Number/percent of women in diabetes group
- Number/percent of women in no diabetes group
- Most prevalent race/ethnicity in diabetes group
- Most prevalent race/ethnicity in no diabetes group
- Number/percent of most prevalent race/ethnicity in diabetes group
- Number/percent of most prevalent race/ethnicity in no diabetes group
- Mean/SD education diabetes group
- Mean/SD education no diabetes group
- Type of diabetes (type 1; type 2; both type 1 and type 2; not stated)
- Mean/SD diabetes duration
- Percent retinopathy; nephropathy; neuropathy complications
- Percent diet/exercise; oral medication; insulin treatment
- Mean/SD HbA1c diabetes group
- Mean/SD HbA1c no diabetes group
- Mean/SD fasting glucose diabetes group

- Mean/SD fasting glucose no diabetes group
- Mean/SD random glucose diabetes group
- Mean/SD random glucose no diabetes group

Outcomes

- Yes/No depression assessment
- Yes/No dementia assessment
- Yes/No anxiety assessment
- Yes/No substance abuse assessment
- Yes/No neuroimaging
- Yes/No functional assessment
- Yes/No animal naming test
- Mean/SD Animal Naming test score diabetes group
- Mean/SD Animal Naming test score no diabetes group
- Yes/No Benton Visual Retention Test
- Mean/SD Benton Visual Retention Test score diabetes group
- Mean/SD Benton Visual Retention Test score no diabetes group
- Yes/No Boston Diagnostic Aphasia Examination test
- Mean/SD Boston Diagnostic Aphasia Examination score diabetes group
- Mean/SD Boston Diagnostic Aphasia Examination score no diabetes group
- Yes/No Boston Naming Test
- Mean/SD Boston Naming Test score diabetes group
- Mean/SD Boston Naming Test score no diabetes group
- Yes/No California Verbal Learning Test
- Mean/SD California Verbal Learning Test score diabetes group
- Mean/SD California Verbal Learning Test score no diabetes group
- Yes/No Category Fluency test
- Mean/SD Category Fluency test score diabetes group
- Mean/SD Category Fluency test score no diabetes group
- Yes/No Clock Drawing test
- Mean/SD Clock Drawing test score diabetes group
- Mean/SD Clock Drawing test score no diabetes group
- Yes/No Controlled Oral Word Association test
- Mean/SD Controlled Oral Word Association test score diabetes group
- Mean/SD Controlled Oral Word Association test score no diabetes group
- Yes/No Finger Tapping test
- Mean/SD Finger Tapping test score diabetes group
- Mean/SD Finger Tapping test score no diabetes group
- Yes/No Grooved Pegboard test
- Mean/SD Grooved Pegboard test score diabetes group
- Mean/SD Grooved Pegboard test score no diabetes group
- Yes/No Mini-Mental Status Exam
- Mean/SD Mini-Mental Status Exam score diabetes group
- Mean/SD Mini-Mental Status Exam score no diabetes group
- Yes/No Modified Mini-Mental Status Exam

- Mean/SD Modified Mini-Mental Status Exam score diabetes group
- Mean/SD Modified Mini-Mental Status Exam score no diabetes group
- Yes/No National Adult Reading Test
- Mean/SD National Adult Reading Test score diabetes group
- Mean/SD National Adult Reading Test score no diabetes group
- Yes/No North American Adult Reading Test
- Mean/SD North American Adult Reading Test score diabetes group
- Mean/SD North American Adult Reading Test score no diabetes group
- Yes/No Paced Auditory Serial Addition Test
- Mean/SD Paced Auditory Serial Addition Test score diabetes group
- Mean/SD Paced Auditory Serial Addition Test score no diabetes group
- Yes/No Raven's Progressive Matrices
- Mean/SD Raven's Progressive Matrices score diabetes group
- Mean/SD Raven's Progressive Matrices score no diabetes group
- Yes/No Rey Auditory Verbal Learning Test
- Mean/SD Rey Auditory Verbal Learning Test score diabetes group
- Mean/SD Rey Auditory Verbal Learning Test score no diabetes group
- Yes/No Rey Osterrieth Complex Figure Test
- Mean/SD Rey Osterrieth Complex Figure Test score diabetes group
- Mean/SD Rey Osterrieth Complex Figure Test score no diabetes group
- Yes/No Stroop test
- Mean/SD Stroop test score diabetes group
- Mean/SD Stroop test score no diabetes group
- Yes/No Trail Making Test Part A
- Mean/SD Trail Making Test Part A score diabetes group
- Mean/SD Trail Making Test Part A score no diabetes group
- Yes/No Trail Making Test Part B
- Mean/SD Trail Making Test Part B score diabetes group
- Mean/SD Trail Making Test Part B score no diabetes group
- Version of Wechsler Adult Intelligence Scale (WAIS) (original; revised; III; IV)
- Yes/No WAIS Arithmetic
- Mean/SD WAIS Arithmetic score diabetes group
- Mean/SD WAIS Arithmetic score no diabetes group
- Yes/No WAIS Block Design
- Mean/SD WAIS Block Design score diabetes group
- Mean/SD WAIS Block Design score no diabetes group
- Yes/No WAIS Comprehension
- Mean/SD WAIS Comprehension score diabetes group
- Mean/SD WAIS Comprehension score no diabetes group
- Yes/No WAIS Digit Span
- Mean/SD WAIS Digit Span score diabetes group
- Mean/SD WAIS Digit Span score no diabetes group
- Yes/No WAIS Digit Symbol
- Mean/SD WAIS Digit Symbol score diabetes group
- Mean/SD WAIS Digit Symbol score no diabetes group
- Yes/No WAIS Information

- Mean/SD WAIS Information score diabetes group
- Mean/SD WAIS Information score no diabetes group
- Yes/No WAIS Letter Number Sequencing
- Mean/SD WAIS Letter Number Sequencing score diabetes group
- Mean/SD WAIS Letter Number Sequencing score no diabetes group
- Yes/No WAIS Matrix Reasoning
- Mean/SD WAIS Matrix Reasoning score diabetes group
- Mean/SD WAIS Matrix Reasoning score no diabetes group
- Yes/No WAIS Object Assembly
- Mean/SD WAIS Object Assembly score diabetes group
- Mean/SD WAIS Object Assembly score no diabetes group
- Yes/No WAIS Picture Arrangement
- Mean/SD WAIS Picture Arrangement score diabetes group
- Mean/SD WAIS Picture Arrangement score no diabetes group
- Yes/No WAIS Picture Completion
- Mean/SD WAIS Picture Completion score diabetes group
- Mean/SD WAIS Picture Completion score no diabetes group
- Yes/No WAIS Similarities
- Mean/SD WAIS Similarities score diabetes group
- Mean/SD WAIS Similarities score no diabetes group
- Yes/No WAIS Vocabulary
- Mean/SD WAIS Vocabulary score diabetes group
- Mean/SD WAIS Vocabulary score no diabetes group
- Version of Wechsler Memory Scale (WMS) (original; revised; III; IV)
- Yes/No WMS Digit Span
- Mean/SD WMS Digit Span score diabetes group
- Mean/SD WMS Digit Span score no diabetes group
- Yes/No WMS Logical Memory I
- Mean/SD WMS Logical Memory I score diabetes group
- Mean/SD WMS Logical Memory I score no diabetes group
- Yes/No WMS Logical Memory II
- Mean/SD WMS Logical Memory II score diabetes group
- Mean/SD WMS Logical Memory II score no diabetes group
- Yes/No WMS Spatial Span
- Mean/SD WMS Spatial Span score diabetes group
- Mean/SD WMS Spatial Span score no diabetes group
- Yes/No WMS Verbal Paired Associates I
- Mean/SD WMS Verbal Paired Associates I score diabetes group
- Mean/SD WMS Verbal Paired Associates I score no diabetes group
- Yes/No WMS Verbal Paired Associates II
- Mean/SD WMS Verbal Paired Associates II score diabetes group
- Mean/SD WMS Verbal Paired Associates II score no diabetes group
- Yes/No WMS Visual Memory
- Mean/SD WMS Visual Memory score diabetes group
- Mean/SD WMS Visual Memory score no diabetes group
- Yes/No WMS Visual Reproduction

- Mean/SD WMS Visual Reproduction score diabetes group
- Mean/SD WMS Visual Reproduction score no diabetes group
- Yes/No WMS Wisconsin Card Sorting Test
- Mean/SD WMS Wisconsin Card Sorting Test score diabetes group
- Mean/SD WMS Wisconsin Card Sorting Test score no diabetes group
- Verbal Fluency Test (not performed; animals; categories; letters; not stated)