

Supplementary materials to: Lim JP, Lau S, Lun P, et al. Optimising dementia screening in community-dwelling older adults: A rapid review of brief diagnostic tools in Singapore. *Ann Acad Med Singap* 2024;53.

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Supplementary Table S1A. Search strategy for PubMed.

Search Number	Query	Results	Filters
1	("aged"[MeSH Terms]) OR ("aging"[MeSH Terms])	3,626,867	
2	elder*[Title/Abstract] OR senior*[Title/Abstract] OR "older adult*[Title/Abstract] OR "older person*[Title/Abstract] OR "older people"[Title/Abstract] OR "ageing"[Title/Abstract] OR aging[Title/Abstract] OR "old age"[Title/Abstract]	717,090	
3	#1 OR #2	3,884,163	
4	(((((("ambulatory care"[MeSH Terms]) OR ("health services for the aged"[MeSH Terms])) OR ("adult day care centers"[MeSH Terms])) OR ("community health nursing"[MeSH Terms])) OR ("community mental health services"[MeSH Terms])) OR ("home care services"[MeSH Terms])) OR ("senior centers"[MeSH Terms])) OR ("primary health care"[MeSH Terms])	330,410	
5	"ambulatory care"[Title/Abstract] OR "clinic visit*[Title/Abstract] OR "outpatient health service*[Title/Abstract] OR "outpatient care"[Title/Abstract] OR "outpatient service*[Title/Abstract] OR "urgent care"[Title/Abstract] OR "health services for the aged"[Title/Abstract] OR "Health Services for Aged"[Title/Abstract] OR "Health Services for the Elderly"[Title/Abstract] OR "geriatric health service*[Title/Abstract] OR "adult day care centre*[Title/Abstract] OR "adult day care center*[Title/Abstract] OR "community health nursing"[Title/Abstract] OR "home care"[Title/Abstract] OR "Domiciliary Care"[Title/Abstract] OR "primary healthcare"[Title/Abstract] OR "primary health care"[Title/Abstract] OR "primary care"[Title/Abstract] OR "community mental health service*[Title/Abstract] OR "assertive community treatment"[Title/Abstract] OR "senior centre*[Title/Abstract] OR "senior center*[Title/Abstract] OR "center* for the aged"[Title/Abstract] OR "centre* for the aged"[Title/Abstract]	229,044	
6	#4 OR #5	461,660	
7	#3 OR #6	4,218,351	
8	((("neuropsychological tests"[MeSH Terms]) OR ("mental status and dementia tests"[MeSH Terms])) OR ("geriatric assessment"[MeSH Terms])	220,002	
9	"neuropsychological test*[Title/Abstract] OR "neuropsychological assessment*[Title/Abstract] OR "neuropsychological screen*[Title/Abstract] OR "neurological test*[Title/Abstract] OR "neurological assessment*[Title/Abstract] OR "neurological screen*[Title/Abstract] OR "mental status test*[Title/Abstract] OR "mental status assessment*[Title/Abstract] OR "mental status screen*[Title/Abstract] OR "dementia test*[Title/Abstract] OR "dementia assessment*[Title/Abstract] OR "dementia screen*[Title/Abstract] OR "geriatric test*[Title/Abstract] OR	55,627	

	"geriatric assessment*" [Title/Abstract] OR "geriatric screen*" [Title/Abstract] OR "cognitive test*" [Title/Abstract] OR "cognitive assessment*" [Title/Abstract] OR "cognitive screen*" [Title/Abstract]		
10	#8 OR #9	247,347	
11	"singapore" [MeSH Terms]	15,429	
12	(Singapore* [Title/Abstract]) OR (Singapore* [Affiliation])	131,727	
13	#11 OR #12	133,264	
14	#7 AND #10 AND #13	776	
15	#7 AND #10 AND #13	776	English

Supplementary Table S1B. Search strategies for Embase.

Search Number	Query	Results
1	exp aged/ or exp aging/	3743771
2	(elder* or senior* or "older adult*" or "older person*" or "older people" or "ageing" or aging or "old age").ab,ti.	934442
3	1 or 2	4025607
4	exp ambulatory care/ or exp elderly care/ or exp adult day care/ or exp community health nursing/ or exp community mental health service/ or exp home care/ or exp senior center/ or exp primary health care/	426269
5	("ambulatory care" or "clinic visit?" or "outpatient health service?" or "outpatient care" or "outpatient service?" or "urgent care" or "health services for the aged" or "Health Services for Aged" or "Health Services for the Elderly" or "geriatric health service?" or "adult day care centre?" or "adult day care center?" or "community health nursing" or "home care" or "Domiciliary Care" or "primary healthcare" or "primary health care" or "primary care" or "community mental health service?" or "assertive community treatment" or "senior centre?" or "senior center?" or "center? For the aged" or "centre? For the aged").ab,ti.	303426
6	4 or 5	550335
7	3 or 6	4415002
8	exp neuropsychological test/ or exp dementia assessment/ or exp geriatric assessment/	207414

9	((neuropsychological or neurological or "mental status" or dementia or geriatric or cognitive) adj (test* or assessment* or screen*)).ab,ti.	86790
10	8 or 9	241046
11	Singapore/	27287
12	Singapore*.ab,ti,in.	184949
13	11 or 12	187034
14	7 and 10 and 13	991
15	limit 14 to English language	990

Supplementary Table S1C. Search strategies for PsycInfo.

Search Number	Query	Results
1	DE "Aging" OR DE "Aging in Place" OR DE "Cognitive Aging" OR DE "Healthy Aging" OR DE "Physiological Aging"	91,027
2	TI (elder* or senior* or "older adult*" or "older person*" or "older people" or "ageing" or aging or "old age") OR AB (elder* or senior* or "older adult*" or "older person*" or "older people" or "ageing" or aging or "old age")	192,253
3	1 or 2	210,831
4	(((DE "Outpatient Treatment" OR DE "Outpatient Commitment")OR (DE "Adult Day Care")) OR (DE "Community Mental Health Services" OR DE "Community Counseling")) OR (DE "Home Care")) OR (DE "Primary Health Care")	48,598
5	TI ("ambulatory care" or "clinic visit#" or "outpatient health service#" or "outpatient care" or "outpatient service#" or "urgent care" or "health services for the aged" or "Health Services for Aged" or "Health Services for the Elderly" or "geriatric health service#" or "adult day care centre#" or "adult daycare center#" or "community health nursing" or "home care" or "Domiciliary Care" or "primary healthcare" or "primary health care" or "primary care" or "community mental health service#" or "assertive community treatment" or "senior centre#" or "senior center#" or "center# for the aged" or "centre# for the aged") OR AB ("ambulatory care" or "clinic visit#" or "outpatient health service#" or "outpatient care" or "outpatient service#" or "urgent care" or "health services for the aged" or "Health Services for Aged" or "Health Services for the Elderly" or "geriatric health service#" or "adult day care centre#" or "adult daycare center#" or "community health nursing" or "home care" or "Domiciliary Care" or "primary healthcare" or "primary	51,661

	health care" or "primary care" or "community mental health service#" or "assertive community treatment" or "senior centre#" or "senior center#" or "center# for the aged" or "centre# for the aged")	
6	4 or 5	74,724
7	3 or 6	277,104
8	(DE "Neuropsychological Assessment" OR DE "Halstead Reitan Neuropsychological Battery" OR DE "Luria Nebraska Neuropsychological Battery" OR DE "Mini Mental State Examination" OR DE "Task Switching" OR DE "Wisconsin Card Sorting Test") OR (DE "Geriatric Assessment")	24,062
9	TI ((neuropsychological or neurological or "mental status" or dementia or geriatric or cognitive) N1(test* or assessment* or screen*)) OR AB ((neuropsychological or neurological or "mental status" or dementia or geriatric or cognitive) N1(test* or assessment* or screen*))	43,186
10	8 or 9	57,952
11	TI Singapore* OR ABSingapore* OR AF Singapore*	17,708
12	7 and 10 and 11	125

Supplementary Table S1D. Search strategies for Cochrane.

Search Number	Query	Results
1	MeSH descriptor: [Aged] explode all trees	242666
2	MeSH descriptor: [Aging] explode all trees	4514
3	(elder* or senior* or "older adult*" or "older person*" or "older people" or "ageing" or aging or "old age"):ti,ab,kw (Word variations have been searched)	844133
4	#1 OR #2 OR #3	844171
5	MeSH descriptor: [Ambulatory Care] explode all trees	4047
6	MeSH descriptor: [Health Services for the Aged] explode all trees	537
7	MeSH descriptor: [Adult Day Care Centers] explode all trees	15
8	MeSH descriptor: [Community Health Nursing] explode all trees	388
9	MeSH descriptor: [Community Mental Health Services] explode all trees	843
10	MeSH descriptor: [Home Care Services] explode all trees	2826

11	MeSH descriptor: [Senior Centers] explode all trees	27
12	MeSH descriptor: [Primary Health Care] explode all trees	10043
13	("ambulatory care" or "clinic visit?" or "outpatient health service?" or "outpatient care" or "outpatient service?" or "urgent care" or "health services for the aged" or "Health Services for Aged" or "Health Services for the Elderly" or "geriatric health service?" or "adult day care centre?" or "adult day care center?" or "community health nursing" or "home care" or "Domiciliary Care" or "primary healthcare" or "primary health care" or "primary care" or "community mental health service?" or "assertive community treatment" or "senior centre?" or "senior center?" or "center? for the aged" or "centre? for the aged"):ti,ab,kw (Word variations have been searched)	44185
14	#5 OR #6 OR #7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13	48422
15	#4 OR #14	863821
16	MeSH descriptor: [Primary Health Care] explode all trees	10043
17	MeSH descriptor: [Mental Status and Dementia Tests] explode all trees	728
18	MeSH descriptor: [Geriatric Assessment] explode all trees	1837
19	((neuropsychological or neurological or "mental status" or dementia or geriatric or cognitive) NEAR/1 (test* or assessment* or screen*)):ti,ab,kw (Word variations have been searched)	20538
20	#16 OR #17 OR #18 OR #19	30594
21	MeSH descriptor: [Singapore] this term only	424
22	(Singapore*) (Word variations have been searched)	5223
23	#21 OR #22	5223
24	#15 AND #20 AND #23	84

Supplementary Table S2. Risk-of-bias assessment on QUADAS-2 tool.

Author, year	PATIENT SELECTION			INDEX TEST		REFERENCE STANDARD		FLOW AND TIMING			
	Consecutive /random sample of patients enrolled	Case-control design avoided	Avoid inappropriate exclusions	Index test results interpreted without knowledge of reference standard results	Pre-specified threshold used (if applicable)	Reference standard likely to correctly classify target condition	Reference standard results interpreted without knowledge of index test results	Appropriate interval between index test and reference standard	All patients receive reference standard	Patients receive the same reference standard	All patients included in the analysis
Chan et al, 2016 ¹⁶	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
	Unclear			Low		Low		High			
Chan et al, 2015 ¹⁷	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
	Unclear			Low		Low		High			
Chong et al, 2006 ²²	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Low			Low		Low		Low			
Dong et al, 2013 ¹¹	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	High			Low		Low		Low			
Kan et al, 2019 ²¹	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Unclear			Low		Low		Low			
Koh et al, 2020 ¹⁴	Unclear	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Unclear	Yes
	High			High		Low		Unclear			
	Yes	Yes	Yes	Yes	NA	Yes	Yes	Unclear	Yes	No	Yes

Li et al, 2006 ¹⁹	Low			Low		Low		High			
Pang et al, 2022 ²⁰	Yes	Yes	Yes	Yes	NA	Yes	Unclear	Yes	Yes	Yes	Yes
	Low			Low		Unclear		Low			
Pang et al, 2023 ²⁴	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclear	No	Yes	No
	Low			Low		Low		High			
Shaik et al, 2016 ¹⁸	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Low			Low		Low		Low			
Sahadevan et al, 2000 ¹²	Unclear	No	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
	High			Low		Low		High			
Tew et al, 2015 ¹⁵	Yes	No	Yes	Yes	NA	Yes	Yes	Yes	No	No	Yes
	High			Low		Low		High			
Venketasubramanian, 2024 ²³	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Low			Low		Low		Low			
Yap et al, 2007 ¹³	Unclear	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
	High			High		Low		High			

Supplementary Table S3. Extracted study characteristics of included studies.

Author (year)	Study design; Study setting	Sampling method	Sample size	Mean age (years)	Males (%)	Brief screening tools	Comparator tools	Methods used to diagnose dementia	Statistical analysis
Self-rated/Informant-based measures only									
Chan QL et al (2015) ¹⁷	Cross-sectional; Primary care	Convenience: recruitment of participant-informant dyads at the waiting area of the primary healthcare centres/ over the phone if the patient had no readily available informant present on-site	309	71.7 ± 8.2	45.6	AD8	MMSE / MoCA	- Multi-disciplinary research consensus meeting - DSM-IV criteria - CDR global scores	ROC curve analysis
Dong YH (2013) ¹¹	Case-control; Memory clinic (cases), community (control)	Convenience: cognitively impaired participants recruited from the outpatient clinic; controls were volunteers recruited from the community	250	73.4 ± 8.6	45.7	AD8	MMSE / MoCA	- Multi-disciplinary research consensus meeting - DSM-IV criteria - subtypes according to internationally accepted criteria	ROC curve analysis
Pang T (2022) ²⁰	Cohort; Community	Random sampling: multi-ethnic subjects 60yrs or older recruited from	957	70.2±6.6	48.3	Phase 1: AMT and PFQ	MoCA	- Multi-disciplinary research	ROC analysis; Pearson correlation

		baseline participant pool by telephone or home visits (2011-2017)				Phase 2: SCC assessment (GDS-10, AD8-8pt, AD8-8info)		consensus meeting - DSM-IV criteria	coefficient and Cohen's kappa coefficient for different single-question SCC tools
Performance-based measures only									
Koh W (2020) ¹⁴	Case-control; Memory clinic(cases), community(control)	Convenience; random assignment to either development or validation study arms	625	NA	NA	VCAT-S	- Original VCAT - MMSE - MoCA	Diagnosis by Neurologists: Clinical examination, neuropsychological assessment and structural MRI imaging where available	ROC analysis; 2x2 tables
Sahadevan S (2000) ¹²	Case-control; Memory clinic(cases), community(control)	Controls: Random selection of controls from a membership list Cases: not stated	246	60-74 yrs:65.4% 75 yrs and more: 34.6%	42.7	AMT	cMMSE	Diagnosis by Consultant geriatrician, diagnosed based on DSM-IV criteria	ROC analysis to determine optimal cut-offs for entire cohort, then stratified by education-by-age categories.

Yap PLK (2007) ¹³	Case-control; Memory clinic(cases), community(control)	Controls: Residents in the defined survey area were identified in door-to-door census and invited to participate in the health examination. Cases: not stated	148	70.7±4.5	61.5	Clock Drawing Test: CLOX1 and CLOX2	NA	Diagnosis by Consultant geriatrician and consensus meeting, diagnosed based on DSM-IV criteria	ROC curve analysis; ANOVA
Venketasubramanian (2024) ²³	Cohort (2 phase study); community. Community-based survey of neurological illness. All those who were screened positive in Phase-I on a modified WHO screening tool for neurological disorders, and a proportion of those who were screened negative were assessed in Phase-II	Random sampling	256	70.15	34.6	ECAQ	NA	Diagnosis by Consultant geriatrician or neurologist in community clinic: diagnosed based on DSM-IV criteria	ROC curve analysis

Self-rated/Informant-based measures and performance-based measures in combination									
Chan QL (2016) ¹⁶	Cross-sectional study; Primary care	Convenience: recruitment of participant-informant dyads at the waiting area of the primary healthcare centres or over the phone if the patient had no readily available informant present on-site	309	71.7 ± 8.2	45.6	- AD8 - NINDS-CSN 5-minute protocol (NINDS 5-min)	MMSE / MoCA	- Multi-disciplinary research consensus meeting - DSM-IV criteria - CDR global scores	ROC curve analysis
Chong MS (2006) ²²	Cohort study (2 phase); Community	Random sampling	156	66.8 ± 11.3	49	- PF (yes/no) - AMT	NA	Diagnosis by Consultant geriatrician or neurologist in community clinic: diagnosed based on DSM-IV criteria	ROC curve analysis
Kan CN (2019) ²¹	Cohort study; Community	Not stated	761	72.7 ± 6.8	46.2	AD8	- MMSE - MoCA - VDB: <i>Vascular dementia battery</i>	- Multi-disciplinary research consensus meeting - DSM-IV criteria	ROC curve analysis
Li ML (2006) ¹⁹	Combined cohorts; Neuroscience	Random sampling	144	71.89 ± 4.62	49.3	- IRMP - 4IADL	- MMSE	- Multi-disciplinary research	Stepwise Log regression

	clinic patients, community cohort							consensus meeting - CDR scoring	for composite 4iADL tool; ROC curve analysis
Pang (2023) ²⁴	Cohort study (2 phase); Community	Age-stratified random sampling	918	70.2 ± 6.6	48.1	- PFQ - AMT	- MMSE - MoCA	- Multi-disciplinary research consensus meeting	ROC curve analysis; cost-effectiveness
Shaik MA (2016) ¹⁸	Cohort study (2 phase); Primary care	Random sampling	305	71.8 ±8.2	45.2	TRS+AD8	- MMSE - MoCA	- Multi-disciplinary research consensus meeting	Log regression for significant risk factors of cognitive impairment; ROC curve analysis
Tew CW (2015) ¹⁵	Case-control; Memory clinic(cases), Community (Age-matched control)	Cases: consecutively recruited Controls: convenience	245	72.25 ±7.6	33.1	AD8+Reca II ADR+Reca II+Copy	- MMSE	- Multi-disciplinary research consensus meeting - CDR scoring	ROC curve analysis

Abbreviations: 4iADL= brief Instrumental Activities of Daily Living scale; 5-min MoCA= 5-minute Montreal Cognitive Assessment; AD8= Eight-item Informant Interview to Differentiate Aging and Dementia; AD8-8= 8th question of Ascertain Dementia 8; AMT= Abbreviated Mental Test; CLOX= Clock Drawing Test; E/C/M/T=English/Chinese/Malay/Tamil; ECAQ= Elderly Cognitive Assessment Questionnaire; GDS-10=10th item on the Geriatric Depression Scale; iAD8=informant AD-8; IRMP= Informant Report of a single question on Memory Decline; LC=Language Neutral; NINDS-CSN 5-min = National Institute of Neurological Disorders and Stroke-Canadian Stroke Network 5-minute protocol; PF= Progressive Forgetfulness; VCAT-S= Visual Cognitive Assessment Test-short form; TRS= Total Risk Score