Supplementary Material

Systematic Review and Meta-Analysis of Brief Cognitive Instruments to Evaluate Suspected Dementia in Chinese-Speaking Populations

Supplementary File 1. The Centre for Evidence Based Medicine (CEBM) criteria [1]

Question	In this paper		
	Yes (2 points)	No (0 point)	Unclear (1 point)
1. Was the diagnostic test evaluated in a representative spectrum of patients (like those in whom it would be used in practice)?	☐	☐	☐
2. Was the reference standard applied regardless of the index test result?	☐	☐	☐
3. Was there an independent, blind comparison between the index test and an appropriate reference ('gold') standard of diagnosis?	☐	☐	☐
4. What were the results? (Are test characteristics presented?)	☐	☐	☐
5. Were the methods for performing the test described in sufficient detail to permit replication?	☐	☐	☐

Supplementary Table 1. The Manchester Translation Reporting Questionnaire (MTRQ), and Manchester Cultural Adaptation Reporting Questionnaire (MCAR)

Score	MTRQ Definition	MCAR Definition
0	The translation procedure is not mentioned.	The cultural adaptation procedure is not mentioned.
1	The translation procedure is mentioned with no details of the process.	The cultural adaptation procedure is mentioned with no details of the process.
2a	The translation procedure is mentioned in insufficient details for replication.	The cultural adaptation procedure is mentioned in insufficient detail for replication.
2b	The translation procedure is mentioned by referring to another publication that describes the translation process in insufficient detail for replication.	The cultural adaptation procedure is mentioned by referring to another publication that describes the cultural adaptation process in insufficient detail for replication.
3	The translation procedure is only described according to pre-existing guidelines on translating the assessment, with a reference to the guidelines provided.	The cultural adaptation procedure is described only according to pre-existing guidelines on culturally adapting the assessment, with a reference to the guidelines provided.
4a	The translation procedure is described in sufficient detail for replication of the process.	The cultural adaption procedure is described in sufficient details for replication of the process, including reasons for cultural adaption and for the selection and replacement of items in the assessment.
4b	The translation procedure is mentioned by referring to a publication that describes the translation process in sufficient detail for replication, with a reference to that publication.	The cultural adaption procedure is mentioned by referring to a publication that describes the cultural adaption process of that assessment in sufficient detail for replication, including reasons for cultural adaption and for the selection and replacement of items in the assessment, with a reference to that publication.

This table was retrieved from Mirza et al., (2017) [2]

Supplementary File 2. Research Protocol

Systematic Review Protocol

Research Question: A systematic review of the validity and reliability of brief cognitive instruments used in clinical settings with Chinese-speaking patients to evaluate suspected dementia or MCI

Database:
1. Embase 1974 to 2019 April 12
2. Ovid MEDLINE(R) 1946 to April Week 1 2019
3. PsycINFO 1806 to April Week 2 2019
4. PsycTESTS 1910 to March 2019
5. Web of Science core collection
6. The Cochrane Library (Cochrane Database of Systematic Reviews, Cochrane Central Register of Controlled Trials (CENTRAL), Cochrane Methodology Register)

Search strategy:
1. Title, keywords or abstract: Chinese OR Mandarin OR Hokkien OR Hoklo OR Cantonese OR Hakka OR Taiwan* OR China OR Hong Kong* or Singapore* or Macao OR Malaysia
2. And Title, keywords or abstract: Alzheimer* OR AD OR dement* OR VaD OR FTD OR Mild cognitive impairment OR MCI OR memory loss
3. And all fields: assessment OR evaluation OR scale OR test OR tool OR Instrument OR battery OR measure* OR screen* OR diagnos* OR inventory* OR validat*

Inclusion:
1. original peer reviewed research
2. human subjects

Further detail:
Assessments used in studies should meet the criteria as follows---
1. the measure is validated as part of the study
2. diagnosis purpose
3. in Chinese speaking populations
4. cognitive assessments (other kinds of assessments will be excluded, e.g., behavioural assessments or functional assessments)
5. in a memory clinic or similar setting
6. taking <20 minutes
7. assessing the patient directly, not through an informant, and
8. face-to-face

Exclusion:
The study does not meet those criteria mentioned

Supplementary Table 2. PRISMA-DTA Checklist

Section/topic	#	PRISMA-DTA Checklist Item	Reported on page #
TITLE / ABSTRACT			
Title	1	Identify the report as a systematic review (+/- meta-analysis) of diagnostic test accuracy (DTA) studies.	Page 1 (Title)
Abstract	2	Abstract: See PRISMA-DTA for abstracts.	Page 1 (Abstract)
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	Page 2 (Introduction)
Clinical role of index test	D1	State the scientific and clinical background, including the intended use and clinical role of the index test, and if applicable, the rationale for minimally acceptable test accuracy (or minimum difference in accuracy for comparative design).	Page 2 (Introduction)
Objectives	4	Provide an explicit statement of question(s) being addressed in terms of participants, index test(s), and target condition(s).	Page 2 (Introduction)
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	Page 2 (Method)
Eligibility criteria	6	Specify study characteristics (participants, setting, index test(s), reference standard(s), target condition(s), and study design) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	Page 2-3 (Method - Inclusion criteria, exclusion criteria)
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	Page 2 (Method - Data sources and search strategy) and Supplementary File 2
Search	8	Present full search strategies for all electronic databases and other sources searched, including any limits used, such that they could be repeated.	Page 2 (Method - Data sources and search strategy) and Supplementary File 2
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	Page 3 (Method - Study selection)
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	Page 3 (Method - Data extraction and definition)
Definitions for data extraction	11	Provide definitions used in data extraction and classifications of target condition(s), index test(s), reference standard(s) and other characteristics (e.g., study design, clinical setting).	Page 3 (Method - Data extraction and definition)
Risk of bias and applicability	12	Describe methods used for assessing risk of bias in individual studies and concerns regarding the applicability to the review question.	Page 3 (Method - Quality assessment and evaluation of translation and cultural adaptation procedures)
Diagnostic accuracy measures	13	State the principal diagnostic accuracy measure(s) reported (e.g., sensitivity, specificity) and state the unit of assessment (e.g., per-patient, per-lesion).	Page 3 (Method - Data extraction and definition) and Supplementary Tables 3 and 4
Synthesis of results	14	Describe methods of handling data, combining results of studies, and describing variability between studies. This could include but is not limited to: a) handling of multiple definitions of target condition. b) handling of multiple thresholds of test positivity, c) handling multiple index test readers, d) handling of indeterminate test results, e) grouping and comparing tests, f) handling of different reference standards	Page 3-4 (Method - Data synthesis and statistical analysis)
Meta-analysis	D2	Report the statistical methods used for meta-analyses, if performed.	Page 3-4 (Method - Data synthesis and statistical analysis)
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	Page 3-4 (Method - Data synthesis and statistical analysis)

RESULTS			
Study selection	17	Provide numbers of studies screened, assessed for eligibility, included in the review (and included in meta-analysis, if applicable) with reasons for exclusions at each stage, ideally with a flow diagram.	Page 4-5 (Results- Study selection) and Figure 1: PRISMA diagram
Study characteristics	18	For each included study provide citations and present key characteristics including a) participant characteristics (presentation, prior testing), b) clinical setting, c) study design, d) target condition definition, e) index test, f) reference standard, g) sample size, h) funding sources	Page 4-5 (Results- Study characteristics and quality analysis)
Risk of bias and applicability	19	Present evaluation of risk of bias and concerns regarding applicability for each study.	Page 4-5 (Results- Study characteristics and quality analysis)
Results of individual studies	20	For each analysis in each study (e.g., unique combination of index test, reference standard, and positivity threshold) report 2x2 data (TP, FP, FN, TN) with estimates of diagnostic accuracy and confidence intervals, ideally with a forest or receiver operator characteristic (ROC) plot.	Page 5-11 (Instruments in meta-analyses) and Supplementary Tables 3-5
Synthesis of results	21	Describe test accuracy, including variability; if meta-analysis was done, include results and confidence intervals.	Page 5-12 (Instruments in meta-analyses)
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression; analysis of index test: failure rates, proportion of inconclusive results, adverse events).	Page 10-13 (sensitivity analysis of univariate and bivariate analysis, meta-regression, publication bias)
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence.	Page 12-13 (Discussion)
Limitations	25	Discuss limitations from included studies (e.g., risk of bias and concerns regarding applicability) and from the review process (e.g., incomplete retrieval of identified research).	Page 12-13 (Discussion)
Conclusions	26	Provide a general interpretation of the results in the context of other evidence. Discuss implications for future research and clinical practice (e.g., the intended use and clinical role of the index test).	Page 12-13 (Discussion)
FUNDING			
Funding	27	For the systematic review, describe the sources of funding and other support and the role of the funders.	Page 13 (Funding)

Supplementary Table 3. Brief cognitive tests for dementia: Diagnostic performance (in alphabetical order)

Settings, Test Code, and Author			Illness	Reference Standard	Numbers (Dementia/ND)	Cut-Off Score	SN (%)	SP (%)	+LR	-LR
ACE-R	**A**	C10	mild AD	NINCDS-ADRDA, CDR	25/51	67/68	92.0	85.7	6.43	0.09
	B	H3	dementia	DSM-IV	54/43	73/74	93.0	95.0	18.60	0.07
ACE-III	**A**	T1	dementia	DSM-V, ICD-10	57/33	73/74	89.5	100	∞	0.11
	B	C9	dementia	VaD = NINDS-AIREN; AD = NINCDS-ADRDA	177/180	82/83	91.1	83.1	5.39	0.11
AFT	**B**	C11	AD	aMCI = NINCDS-ADRDA, Petersen 1999; AD = NINCDS-ADRDA, CDR	124/512	N/A	81.0	81.0	4.26	0.23
non-zodiac animal							85.0	81.0	4.47	0.19
BHT- cog	**B**	T6	dementia	NIAAA, CDR	422/166	9/10	91.5	87.3	7.20	0.10
BNT	**B**	C12	mild AD	NINCDS-ADRDA, CDR	34/100	22/23	79.0	81.0	4.16	0.26
			moderate AD	NINCDS-ADRDA, CDR	38/100	22/23	95.0	81.0	5.00	0.06
		C19	AD	NIAAA	139/211(MCI)	22	77.0	49.3	1.52	0.47
CDT	**A**	H1	dementia	DSM-IV	51/34	3/4	89.4	47.1	1.69	0.23
		T2	AD	DSM-IV, NINCDS-ADRDA, CDR	144/259	2/3	73.0	66.0	2.15	0.41
Command			AD	DSM-IV, NINCDS-ADRDA, CDR	144/259	10/11	67.0	75.0	2.68	0.44
		T3	mild AD	DSM-IV, CDR, NINCDS-ADRDA,	42/40	8.5/11	60.0	72.0	2.14	0.56
			QD	CDR	34/40	9.5/11	74.2	56.4	1.70	0.46
			QD		34/42(mild AD)	8.5/11	60.0	39.0	0.98	1.03
Copy		T2	AD	DSM-IV, NINCDS-ADRDA, CDR	144/259	12/13	51.0	74.0	1.96	0.66
		T3	mild AD		42/40	9.5/10	57.5	85.0	3.83	0.50
			QD		34/40	9.5/11	32.3	84.6	2.10	0.80
			QD		34/42(mild AD)	9.5/10	57.5	68.0	1.80	0.63
CFT-C	**B**	C19	AD	NIAAA	139/211(MCI)	29	52.5	83.9	3.26	0.57
CVVLT	**B**	T7	AD	NINCDS-ADRDA, DSM-IV	232/185	age<75: 1st trial = 4/5	81.0	77.0	3.52	0.25
						age<75: Total = 22/23	91.0	92.0	11.38	0.10
						age<75: 10m recall = 4/5	95.0	97.0	31.67	0.05
						age>75: 1st trial = 3/4	81.0	74.0	3.12	0.26
						age>75: Total = 18/19	86.0	92.0	10.75	0.15
						age>75: 10m recall = 4/5	96.0	92.0	12.00	0.04
						all: 1st trial = 3/4	77.0	80.0	3.85	0.29
						all: Total = 20/21	92.0	91.0	10.22	0.09
						all: 10m recall = 3/4	93.0	97.0	31.00	0.07
DRS/MDRS	**B**	C13	mild AD	NIAAA, CDR	116/167 (MCI)	120	84.5	85.0	5.63	0.18
			moderate AD	NIAAA, CDR	64/116 (mild AD)	103	79.7	78.4	3.69	0.26
		C14	mild AD	NINCDS-ADRDA, DSM-IV	5/16	illiterate = 90/91	81.0	86.0	5.79	0.22
					4/24	primary school = 115/116	88.0	88.0	7.33	0.14
					23/65	secondary school = 120/121	88.0	86.0	6.29	0.14
FAB-Phonemic	**A**	C1	AD	NIA-AA, CDR	76/123	12/13	93.4	82.9	5.46	0.08
					76/37 (naMCI)	12/13	86.1	82.7	4.98	0.17
					76/107 (aMCI)	11/12	77.5	70.7	2.65	0.32
HVLT (learning)	**A**	C2	AD	DSM-IV, NINCDS, ADRDA	97/249	15/16 (total learning, tl)	94.7	92.5	12.63	0.06
						18/19 (tl: age 50-64)	95.5	92.1	12.09	0.05

Settings, Test Code, and Author			Illness	Reference Standard	Numbers (Dementia/ND)	Cut-Off Score	SN (%)	SP (%)	+LR	-LR
						14/15 (tl: age 65-80)	94.8	92.5	12.64	0.06
			dementia			15/16 (tl)	94.7	93.4	14.34	0.06
JLO	**B**	C19	AD	NIAAA	139/211 (MCI)	17	64.0	65.9	1.88	0.55
M-ACE	**A**	C3	Mild dementia	DSM-5, CDR	54/51	21/22	96.0	87.0	7.38	0.05
MMSE	**A**	C3	Mild dementia	DSM-5, CDR	54/51	25/26	88.0	87.0	6.77	0.14
		C7	dementia	AD: NINCDS-ADRDA, VaD: NINDS-AIREN	93/277	literates:22 illiterates:20	83.9	84.5	5.41	0.19
		C10	mild AD	NINCDS-ADRDA, CDR	25/51	23/24	100.0	93.7	15.87	0.00
		H2	dementia	DSM-IV	130/49	24/25	95.4	89.8	9.35	0.05
		T4	dementia	NIAAA, DSM-IV-TR	57/26	24	84.0	86.0	6.00	0.19
	B	H3	dementia	DSM-IV	54/43	25/26	96.0	88.0	8.00	0.05
		H4	AD	Dementia = DSM-IV, AD = NINCDS-ADRDA	64/115	24/25	94.0	98.0	47.00	0.06
		T8	Very mild AD	NINCDS- ADRDA, DSM-IV	52/97	26/27	94.2	83.5	4.78	0.21
		T10	AD	DSM-IV, NINCDS-ADRDA, NIAAA	31/36 (MCI)	18/19	77.0	89.0	7.00	0.26
MoCA	**A**	H2	dementia	DSM-IV	130/49	18/19	92.3	91.8	11.26	0.08
		T4	dementia	NIAAA, DSM-IV-TR	57/26	20	79.0	80.0	3.95	0.26
	B	C19	AD	NIAAA	139/211(MCI)	19	81.3	76.8	3.50	0.24
		S3	major NCD	DSM-5	64/146	overall = 21/22	92.0	96.0	23.00	0.08
					31/93	edu<6 = 20/21	94.0	100.0	∞	0.06
					33/53	edu>6 = 22/23	94.0	98.0	47.00	0.06
		H4	AD	Dementia = DSM-IV, AD = NINCDS-ADRDA	64/115	19/20	94.0	92.0	11.75	0.07
		T8	very-mild AD	NINCDS- ADRDA, DSM-IV	52/97	22/23	82.7	87.6	6.67	0.20
		T9	AD	NINCDS-ADRDA	98/38	21/22	98.0	95.0	19.60	0.02
		T10	AD	DSM-IV, NINCDS-ADRDA, NIAAA	31/36(MCI)	11/12	77.0	84.0	4.81	0.27
MoCA-BC	**B**	C16	mild AD	NIAAA, CDR	80/96 (MCI)	low-level edu = 13	77.4	79.4	3.76	0.28
					180/379 (MCI)	mid-level edu = 15	79.0	88.9	7.12	0.24
					85/188 (MCI)	mid-level edu = 16	78.7	86.7	5.92	0.25
			moderate AD	NIAAA, CDR	132/80 (mild AD)	low-level edu = 10	70.5	81.2	3.75	0.36
					225/180 (mild AD)	mid-level edu = 11	72.9	82.8	4.24	0.33
					84/85 (mild AD)	mid-level edu = 13	76.2	69.4	2.49	0.34
Verbal fluency		C17	AD	NAI-AA	604/329	9/10	85.4	77.6	3.81	0.19
Orientation						5/6	91.5	83.8	5.65	0.10
Visual perception						6/7	75.1	82.6	4.32	0.30
Immediate recall						7/8	77.5	76.0	3.23	0.30
Delayed recall						4/5	93.6	77.2	4.11	0.08
Qmci	**B**	T10	AD	DSM-IV, NINCDS-ADRDA, NIAAA	31/36(MCI)	31/32	94.0	78.0	4.27	0.08
RUDAS	**A**	T5	dementia	NIAAA, DSM-IV-TR	53/22	22	76.0	81.0	4.00	0.30
Silhouettes test	**B**	C19	AD	NIAAA	139/211(MCI)	8/9	78.4	46.4	1.46	0.47

Settings, Test Code, and Author			Illness	Reference Standard	Numbers (Dementia/ND)	Cut-Off Score	SN (%)	SP (%)	+LR	-LR
SPMSQ	**A**	S1	dementia	-	103/24 (NC+MCI)	4/5	78.0	75.0	3.12	0.29
						edu<6 = 5/6	72.0	43.0	1.26	0.65
						edu≥6 = 3/4	79.0	76.0	3.29	0.28
STT(A)	**B**	C20	AD	NINCDS-ADRDA	86/336	age<65, edu<12 = 80/81	91.7	72.1	3.29	0.12
					72/313	age<65; edu>12 = 70/71	87.2	77.8	3.93	0.16
					138/201	age>65, edu<12 = 90/91	84.6	66.7	2.54	0.23
					125/301	age>65, edu>12 = 80/81	88.4	66.4	2.63	0.17
STT(B)	**B**	C20	AD	NINCDS-ADRDA	86/336	age<65, edu<12 = 220/221	92.4	75.0	3.70	0.10
					72/313	age<65; edu>12 = 200/201	90.7	72.5	3.30	0.13
					138/201	age>65, edu<12 = 240/241	76.4	69.9	2.54	0.34
					125/301	age>65, edu>12 = 220/221	89.5	67.0	2.71	0.16
		C19	AD	NIAAA	139/211(MCI)	203	66.9	72.5	2.43	0.46
T&C	**A**	H1	dementia	DSM-IV	51/34	45 sec	74.5	88.2	6.31	0.29
TMT (A)	**A**	C8	AD	NIAAA	108/1026	98/99	77.8	92.0	9.73	0.24
			VaD	NINDS Workshop	122/1026	77/78	85.7	81.6	4.66	0.18
TMT (B)	**A**	C8	AD	NIAAA	108/1026	188/189	83.3	91.8	10.16	0.18
			VaD	NINDS Workshop	122/1026	147/148	81.6	83.9	5.07	0.22
VCAT	**B**	S4	mild AD	NIA-AA	121/117(MCI)	19/20	68.3	84.8	4.49	0.37

The codes starting with syllables of C, H, S, T refer to China, Hong Kong, Singapore, and Taiwan, respectively. A and B refer to the controls were from the clinical and community-based setting, respectively. AD, Alzheimer's disease; QD, questionable dementia; VaD, vascular dementia; aMCI, amnestic mild cognitive impairment; naMCI, nonamnestic MCI; NCD, neurocognitive disorder; ND, non-dementia; SN, sensitivity; SP, specificity; +LR, positive likelihood ratio; -LR, negative likelihood ratio. edu, years of education; NINDS-AIREN, the National Institute of Neurological Disorders and Stroke and the Association Internationale pour la Recherche et l'Enseignement en Neurosciences; NINCDS-ADRDA, National Institute of Neurological and Communicative Disorders and Stroke and the Alzheimer's Disease and Related Disorders Association; CDR, Clinical Dementia Rating; DSM, Diagnostic and Statistical Manual of Mental Disorders; NIAAA, National Institute on Aging/Alzheimer's Association. ACE-R, Addenbrooke's cognitive Examination Revised; AFT, Animal Fluency Test; BHT-cog, Brain Health Test-Cog part; BNT, Boston Naming Test; CDT, Clock Drawing Test; CFT-C, Rey-Osteriche Complex Figure Test-Copy; CVVLT, Chinese version of the Verbal Learning Test; DRS/MDRS, Mattis dementia rating scale; FAB, Frontal Assessment Battery; HVLT, Hopkins Verbal Learning Test; JLO, Judgment of Line Orientation; M-ACE, Mini-Addenbrooke's Cognitive Examination; MMSE, Mini-Mental State Examination; MoCA, Montreal Cognitive Assessment; MoCA-BC, Montreal Cognitive Assessment Basic; Qmci, Quick Mild Cognitive Impairment Screen; RUDAS, Rowland Universal Dementia Assessment Scale; SPMSQ, Short Portable Mental Status Questionnaire; STT, Shape Trail Test; T&C, Time and Change Test; TMT, Trail-Making Test; VCAT, Visual Cognitive Assessment Test

Supplementary Table 4. Brief cognitive tests for MCI: Diagnostic performance (in alphabetical order)

Settings, Test Code, and Author			Illness	Reference Standard	Numbers (MCI/NMCI)	Cut-Off Score	SN (%)	SP (%)	+LR	-LR
ACE-R	**B**	C10	aMCI	Petersen et al 1999, CDR	75/51	85/86	86.7	70.6	2.95	0.19
		H3	MCI	Peterson's criteria	50/43	79/80	74.0	84.0	4.63	0.31
			CI		104/43	79/80	88.0	84.0	5.50	0.14
BHT- cog	**B**	T6	MCI	NIAAA, CDR	225/422 (dementia)	9/10	91.5	64.9	2.61	0.13
BNT	**B**	C12	aMCI	Petersen criteria	38/100	22/23	61.0	81.0	3.21	0.48
		C19	MCI	Petersen et al., 1999	211/241	24	70.6	55.2	1.58	0.53
CFT-C	**B**	C19	MCI	Petersen et al., 1999	211/241	32	46.9	76.8	2.02	0.69
DRS	**B**	C13	MCI	Portet et al., 2006, NIAAA	167/136	131	65.3	67.6	2.02	0.51
FAB-Phonemic	**A**	C1	aMCI	NIA-AA, CDR, Petersen's criteria	106/123	14/15	77.0	64.2	2.15	0.36
			naMCI		37/123	15/16	62.3	58.3	1.49	0.65
			aMCI/naMCI		106/37	14/15	56.6	64.2	1.58	0.68
FAB	**B**	S2	CI	MCI: Peterson 2004, DSM-IV; dementia: DSM-IV, CDR	80/100	unadjusted = 12/13	92.0	78.7	4.32	0.10
						age <75 years = 12/13	92.6	76.5	3.94	0.10
						age ≥75 years = 12/13	83.3	81.8	4.58	0.20
						edu <6 years = 12/13	77.8	95.2	16.21	0.23
						edu ≥6 years = 13/14	91.8	70.3	3.09	0.12
HVLT (learning)	**A**	C2	aMCI	CDR, Folstein and Petersen's criteria	134/249	21/22 (total learning, tl)	69.1	70.7	2.36	0.44
						23/24 (tl: age 50-64)	70.0	71.8	2.48	0.42
						18/19 (tl: age 65-80)	77.6	56.2	1.77	0.40
						11/12 (recognition)	58.9	69.9	1.96	0.59
JLO	**B**	C19	MCI	Petersen et al., 1999	211/241	21	59.7	53.2	1.28	0.76
M-ACE	**A**	C3	MCI	Petersen's criteria, CDR	64/51	25/26	88.0	72.0	3.14	0.17
Mini-Cog	**A**	C4	MCI	Petersen's criteria	119/110	N/A	85.7	79.4	4.16	0.18
MMSE	**A**	C3	MCI	Petersen's criteria, CDR	64/51	27/28	82.0	44.0	1.46	0.41
		C6	amMCI	CDR, MMSE, ADL, RAVLT, ROCF	56/53	27/28	74.0	77.0	3.22	0.34
			asMCI		32/53	28/29	44.8	77.0	1.95	0.72
		C4	MCI	Petersen's criteria	119/110	N/A	64.8	71.6	2.28	0.49
		H2	MCI	Peterson's criteria	93/49	26/27	78.5	81.6	4.27	0.26
			CI	DSM-IV, Peterson's criteria	223/49	26/27	91.5	75.5	3.73	0.11
		T4	MCI	NIAAA, DSM-IV-TR	59/26	27	88.0	70.0	2.93	0.17
	B	C10	aMCI	Petersen et al 1999, CDR	75/51	27/28	52.0	86.3	3.80	0.56
		C15	MCI	CDR, MMSE, Petersen et al, 1999	63/58	edu ≤6 = 26	86.2	60.3	2.17	0.23
					113/112	edu 7-12 = 27	78.6	52.2	1.64	0.41
					88/110	edu >12 = 28	76.4	53.4	1.64	0.44
		C18	MCI	Petersen et al. 1999	121/186	26	83.3	38.3	1.35	0.44
		H3	MCI	Peterson's criteria	50/43	26/27	76.0	81.0	4.00	0.30
			CI	Dementia = DSM-IV, MCI = Peterson's criteria	104/43	25/26	82.7	88.4	7.13	0.20
		H4	aMCI	Petersen et al.1999	87/115	27/28	67.0	83.0	3.94	0.40
		T10	MCI	DSM-IV, NINCDS-ADRDA, NIAAA	36/35	26/27	69.0	97.0	23.00	0.32
MoCA	**A**	C5	MCI	Petersen's criteria	66/215	25/26	92.4	88.4	7.97	0.09

Settings, Test Code, and Author			Illness	Reference Standard	Numbers (MCI/NMCI)	Cut-Off Score	SN (%)	SP (%)	+LR	-LR
		C6	amMCI	CDR, MMSE, ADL, RAVLT, ROCF	56/53	24/25	88.0	66.7	2.64	0.18
			naMCI		33/53	25/26	65.5	56.3	1.50	0.61
Delayed free recall			amMCI		56/53	2/3	83.3	66.0	2.45	0.25
			asMCI		32/53	2/3	55.2	66.0	1.62	0.68
Category prompted recall			amMCI		56/53	3/4	85.4	66.0	2.51	0.22
			asMCI		32/53	3/4	51.7	66.0	1.52	0.73
Multiple choice recognition			naMCI		33/53	4/5	44.8	89.6	4.31	0.62
		H2	MCI	Peterson's criteria	93/49	21/22	82.8	73.5	3.12	0.23
			CI	DSM-IV, Peterson's criteria	223/49	21/22	92.8	73.5	3.50	0.10
		T4	MCI	NIAAA, DSM-IV-TR	59/26	24	88.0	74.0	3.38	0.16
	B	C18	MCI	Petersen et al. 1999	121/186	23	79.6	72.7	2.92	0.28
		C19	MCI	Petersen et al. 1999	211/241	24	81.5	65.1	2.34	0.28
		H4	aMCI	Petersen et al.1999	87/115	22/23	78.0	73.0	2.89	0.30
		S3	mild NCD	DSM-5	41/146	24/25	78.0	62.0	2.05	0.35
					22/93	edu<6 = 22/23	68.0	85.0	4.53	0.38
					19/53	edu>6 = 22/23	37.0	93.0	5.29	0.68
		T9	MCI	Petersen et al. 2001	71/ 38	23/24	92.0	78.0	4.18	0.10
		T10	MCI	DSM-IV, NINCDS-ADRDA, NIAAA	36/35	23/24	94.0	85.0	6.27	0.07
MoCA-BC	**B**	C15	MCI	CDR, MMSE, Petersen et al, 1999	63/58	edu ≤6 = 19	87.9	81.0	4.63	0.15
					113/112	edu 7-12 = 22	92.9	91.2	10.56	0.08
					88/110	edu>12 = 24	89.8	90.9	9.87	0.11
		C16	MCI	Petersen et al 1999	96/82	low-level edu = 19	79.4	70.6	2.70	0.29
					379/285	mid-level edu = 22	77.7	83.0	4.57	0.27
					188/153	high-level edu = 24	89.9	68.6	2.86	0.15
Verbal fluency		C17	MCI	Petersen et al, 1999	456/329	9/10	72.3	55.4	1.62	0.50
Orientation						5/6	91.5	24.3	1.21	0.35
Visual perception						7/8	75.1	51.7	1.55	0.48
Immediate recall						8/9	54.7	71.2	1.90	0.64
Delay recall						9/10	63.2	83.1	3.74	0.44
QCST	**B**	C18	MCI	Petersen et al. 1999	121/186	edu5-8 = 63/64	89.4	91.0	9.93	0.12
						edu9-12 = 65/66	89.3	94.3	15.67	0.11
						edu≥13 = 68/69	86.7	78.2	3.98	0.17
						NA	87.6	84.3	5.58	0.15
Qmci	**B**	T10	MCI	DSM-IV, NINCDS-ADRDA, NIAAA	36/35	51/52	69.0	97.0	23.00	0.32
RUDAS	**A**	T5	MCI	NIAAA, DSM-IV-TR	55/22	23/24	79.0	91.0	8.78	0.23
silhouettes test	**B**	C19	MCI	Petersen et al., 1999	211/241	10	79.6	65.1	2.28	0.31
STT(B)	**B**	C19	MCI	Petersen et al., 1999	211/241	169	50.7	80.0	2.54	0.62
TMT (A)	**A**	C8	MCI	MCI Working Group of EADC	462/1026	72/73	48.4	78.4	2.24	0.66
			VaMCI	Gorelick et al., 2011 guideline	113/1026	63/64	70.5	67.7	2.18	0.44

Settings, Test Code, and Author			Illness	Reference Standard	Numbers (MCI/NMCI)	Cut-Off Score	SN (%)	SP (%)	+LR	-LR
TMT (B)	**A**		MCI	MCI Working Group of EADC	462/1026	135/136	51.8	80.2	2.62	0.60
			VaMCI	Gorelick et al., 2011 guideline	113/1026	126/127	62.9	75.9	2.61	0.49
VCAT	**B**	S4	CI (MCI, AD)	NIA-AA	238/233	24/25	75.4	71.1	2.61	0.35

The codes starting with syllables of C, H, S, T refer to China, Hong Kong, Singapore, and Taiwan, respectively. A and B refer to the controls were from the clinical and community-based setting, respectively. CI, cognitive impairment; aMCI, amnestic MCI; amMCI, aMCI-multiple domains; asMCI, aMCI-single domain; naMCI, nonamnestic MCI; VaMCI, vascular MCI; NMCI, non-MCI; SN, sensitivity; SP, specificity; +LR, positive likelihood ratio; -LR, negative likelihood ratio. edu, years of education; NINDS-AIREN, the National Institute of Neurological Disorders and Stroke and the Association Internationale pour la Recherche et l'Enseignement en Neurosciences; NINCDS-ADRDA, National Institute of Neurological and Communicative Disorders and Stroke and the Alzheimer's Disease and Related Disorders Association; CDR, Clinical Dementia Rating; DSM, Diagnostic and Statistical Manual of Mental Disorders; NIAAA, National Institute on Aging/Alzheimer's Association. ACE-R, Addenbrooke's cognitive Examination Revised; BNT, Boston Naming Test; CFT-C, Rey-Osteriche Complex Figure Test-Copy; DRS/MDRS, Mattis dementia rating scale-Chinese version; FAB, Frontal Assessment Battery; HVLT, Hopkins Verbal Learning Test; JLO, Judgment of Line Orientation; M-ACE, Mini-Addenbrooke's Cognitive Examination; MMSE, Mini-Mental State Examination; MoCA, Montreal Cognitive Assessment; MoCA-BC, Montreal Cognitive Assessment Basic; QCST, Quick Cognitive Screening Test; Qmci, Quick Mild Cognitive Impairment Screen; RUDAS, Rowland Universal Dementia Assessment Scale; STT, Shape Trail Test; TMT, Trail-Making Test; VCAT, Visual Cognitive Assessment Test

Supplementary Table 5. 2x2 data table

Test for dementia		TP	FN	TN	FP
ACE	C9- Wang 2017 [3]	161	16	150	30
	C10- Fang 2014 [4]	23	2	44	7
	H3- Wong 2013 [5]	50	4	41	2
	T1- Yu 2022 [6]	51	0	33	6
		285	**22**	**268**	**45**
CDT	H1- Chan 2005 [9]	46	5	16	18
	T1- Lin 2003 [6]	105	39	171	88
		151	**44**	**187**	**106**
DRS	C14- Guo 2004 [12]	4	1	14	4
		4	0	21	4
		20	3	56	20
		28	**4**	**91**	**14**
MMSE	C3- Yang 2019 [7]	48	6	44	7
	C7- Xu 2003 [15]	78	15	234	43
	H2- Yeung 2014 [8]	124	6	44	5
	T3- Tsai 2016 [10]	48	9	22	4
	C10- Fang 2014 [4]	25	0	48	3
	H3- Wong 2013 [5]	52	2	38	5
	H4- Chu 2015 [14]	60	4	113	2
	T7- Chang 2012 [18]	49	3	81	16
		484	**45**	**624**	**85**
MoCA	H2- Yeung 2014 [20]	120	10	45	4
	T3- Tsai 2016 [10]	45	12	21	5
	H4- Chu 2015 [14]	60	4	106	9
	S3- Liew 2015 [21]	29	2	93	0
		31	2	52	1
	T7- Chang 2012 [18]	43	9	85	12
	T8- Tsai 2012 [22]	96	2	36	2
		424	**41**	**438**	**33**
STT-A	C20- Zhao 2013 [23]	79	7	242	94
		63	9	244	69
		117	21	134	67
		111	15	200	101
		370	**52**	**820**	**331**
STT-B	C20- Zhao 2013 [23]	79	7	252	84
		65	7	227	86
		105	33	140	61
		112	13	202	99
		361	**60**	**821**	**330**

Test for MCI		TP	FN	TN	FP
ACE	C10- Fang 2014 [4]	65	10	36	15
	H3- Wong 2013 [5]	37	13	36	7
		102	**23**	**72**	**22**
MMSE	C3- Yang 2019 [7]	52	12	22	29
	H2- Yeung 2014 [8]	73	20	40	9
	T3- Tsai 2016 [10]	52	7	18	8
	C10- Fang 2014 [4]	39	36	44	7
	C15- Chen 2016 [11]	54	9	35	23
		89	24	58	54
		67	21	59	51
	C18- Guo 2010 [13]	101	20	71	115
	H3- Wong 2013 [5]	38	12	35	8
	H4- Chu 2015 [14]	58	29	95	20
	T9- Lee 2018 [16]	25	11	34	1
		648	**201**	**511**	**325**
MoCA	C5- Wen 2008 [17]	61	5	190	25
	H2- Yeung 2014 [8]	77	16	36	13
	T3- Tsai 2016 [10]	52	7	19	7
	C18- Guo 2010 [13]	96	25	135	51
	C19- Huang 2019 [19]	172	39	157	84
	H4- Chu 2015 [14]	68	19	84	31
	S3- Liew 2015 [21]	15	7	79	14
		7	12	49	4
	T8- Tsai 2012 [22]	65	6	30	8
	T9- Lee 2018 [16]	34	2	30	5
		647	**138**	**809**	**242**
MoCA-BC	C15- Chen 2016 [11]	55	8	47	11
		105	8	102	10
		79	9	90	20
	C16- Huang 2018 [24]	76	20	58	24
		295	85	237	49
		169	19	105	48
		778	**149**	**649**	**151**

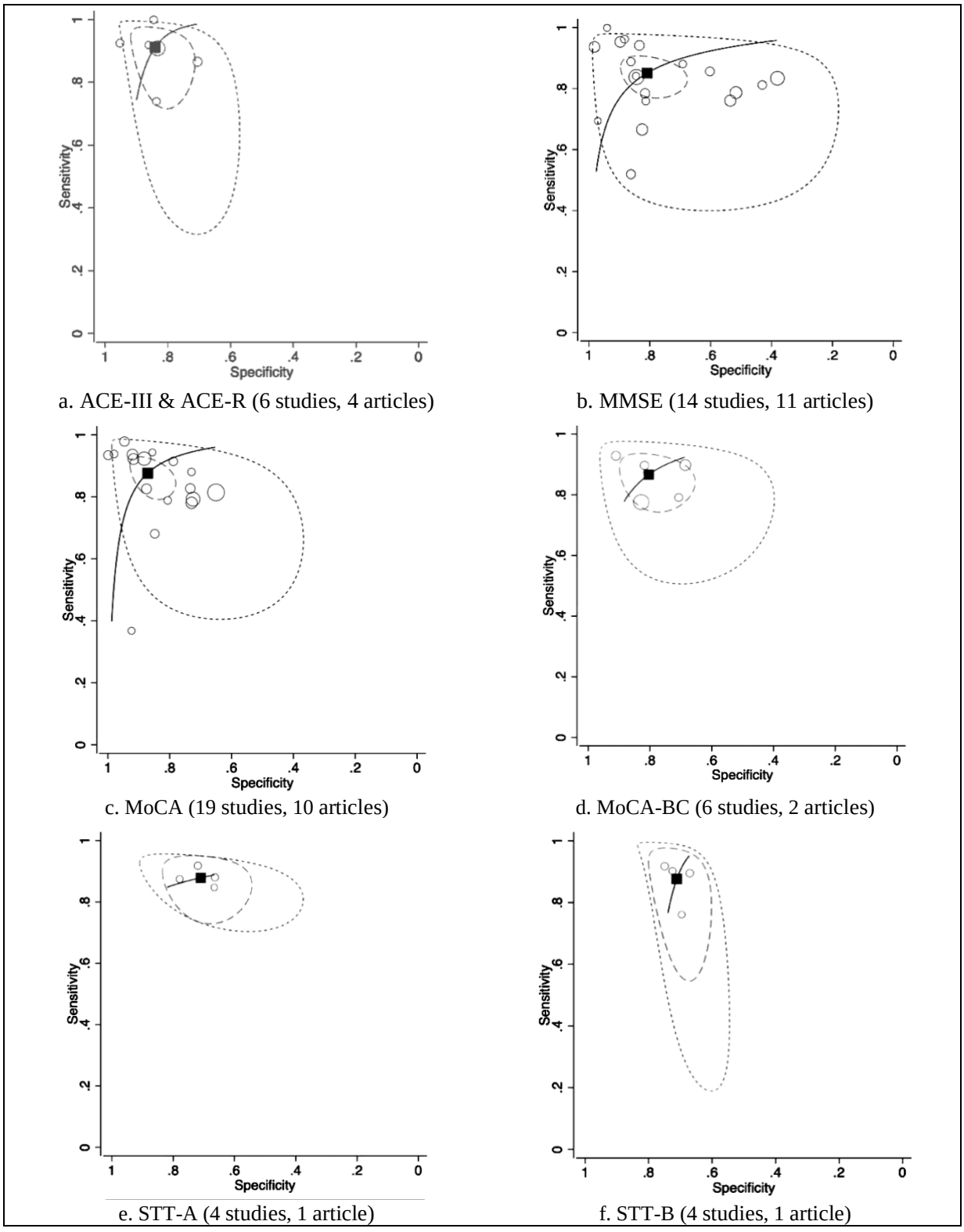
The codes starting with syllables of C, H, S, T refer to China, Hong Kong, Singapore, and Taiwan, respectively; TP, true positive; FN, false negative; TN, true negative; FP, false positive; ACE, Addenbrooke's Cognitive Examination III & Revised; CDT, Clock Drawing Test; DRS, Mattis Dementia Rating Scale; MMSE, Mini-Mental State Examination; MoCA, Montreal cognitive assessment; MoCA-BC, Montreal cognitive assessment-Basic; STT-A&B, Shape Trail Test-A & B

Supplementary Table 6. Random-effect bivariate model analysis

Disease classification	Test	Sensitivity			Specificity			Generalized		covar	rho	RE versus FE model $\chi 2$ (*p*)
		Pooled	Tau^2	I^2	Pooled	Tau^2	I^2	Tau^2	I^2			
Dementia	**ACE**	0.94 (0.88-0.97)	0.08	0.19	0.86 (0.80-0.91)	0.02	0.09	0.00	0.00	0.04	1.00	0 (0.94)
	CDT	0.77 (0.71-0.83)	0.00	0.00	0.64 (0.58-0.69)	0.00	0.00					
	DRS	0.87 (0.71-0.95)	0.00	0.00	0.87 (0.79-0.92)	0.00	0.00	0.00	0.00	-0.00	-0.08	0 (1.00)
	MMSE	0.92 (0.88-0.95)	0.29	0.49	0.90 (0.85-0.93)	0.26	0.54	0.01	0.30	0.25	1.00	14 (0.00*)
	MoCA	0.93 (0.87-0.96)	0.54	0.60	0.94 (0.88-0.97)	0.72	0.59	0.00	0.00	0.62	1.00	18 (0.00*)
	STT-A	0.88 (0.84-0.91)	0.01	0.07	0.71 (0.66-0.76)	0.04	0.68	0.00	0.00 [d]	0.02	1.00	4 (0.24)
	STT-B	0.88 (0.80-0.93)	0.22	0.69	0.71 (0.68-0.74)	0.01	0.30	0.00	0.33 [d]	0.04	0.86	8 (0.06)
MCI	**ACE**	0.82 (0.74-0.87)	0.00	0.00	0.77 (0.67-0.84)	0.00	0.00			0.00		
	MMSE	0.76 (0.70-0.81)	0.19	0.69	0.70 (0.56-0.81)	0.86	0.88	0.05	0.69 [d]	-0.34	-0.84	122 (0.00*)
	MoCA	0.83 (0.74-0.89)	0.56	0.76	0.80 (0.73-0.85)	0.23	0.68	0.12	0.72 [d]	-0.08	-0.21	42 (0.00*)
	MoCA-BC	0.87 (0.81-0.91)	0.20	0.70	0.82 (0.74-0.89)	0.32	0.81	0.05	0.74 [d]	0.11	0.43	36 (0.00*)

The pooled sensitivity and specificity are based on marginal summary measures of test accuracy (absolute measures); [d] The random-effect bivariate model had a heterogeneity lower than 75% while that of the random-effect univariate model was higher than 75%. Addenbrooke's Cognitive Examination-Revised & III; CDT, Clock Drawing Test; DRS/MDRS, Mattis dementia rating scale-Chinese version; MMSE, Mini-Mental State Examination; MoCA, Montreal Cognitive Assessment (including different scoring systems); MoCA-BC, Montreal Cognitive Assessment Basic; STT, Shape Trail Test

Supplementary Figure 1. The hierarchical summary receiver operating characteristic (HSROC) and summary receiver operating characteristic (SROC) curves of the eight tests



a. ACE-III & ACE-R (6 studies, 4 articles)

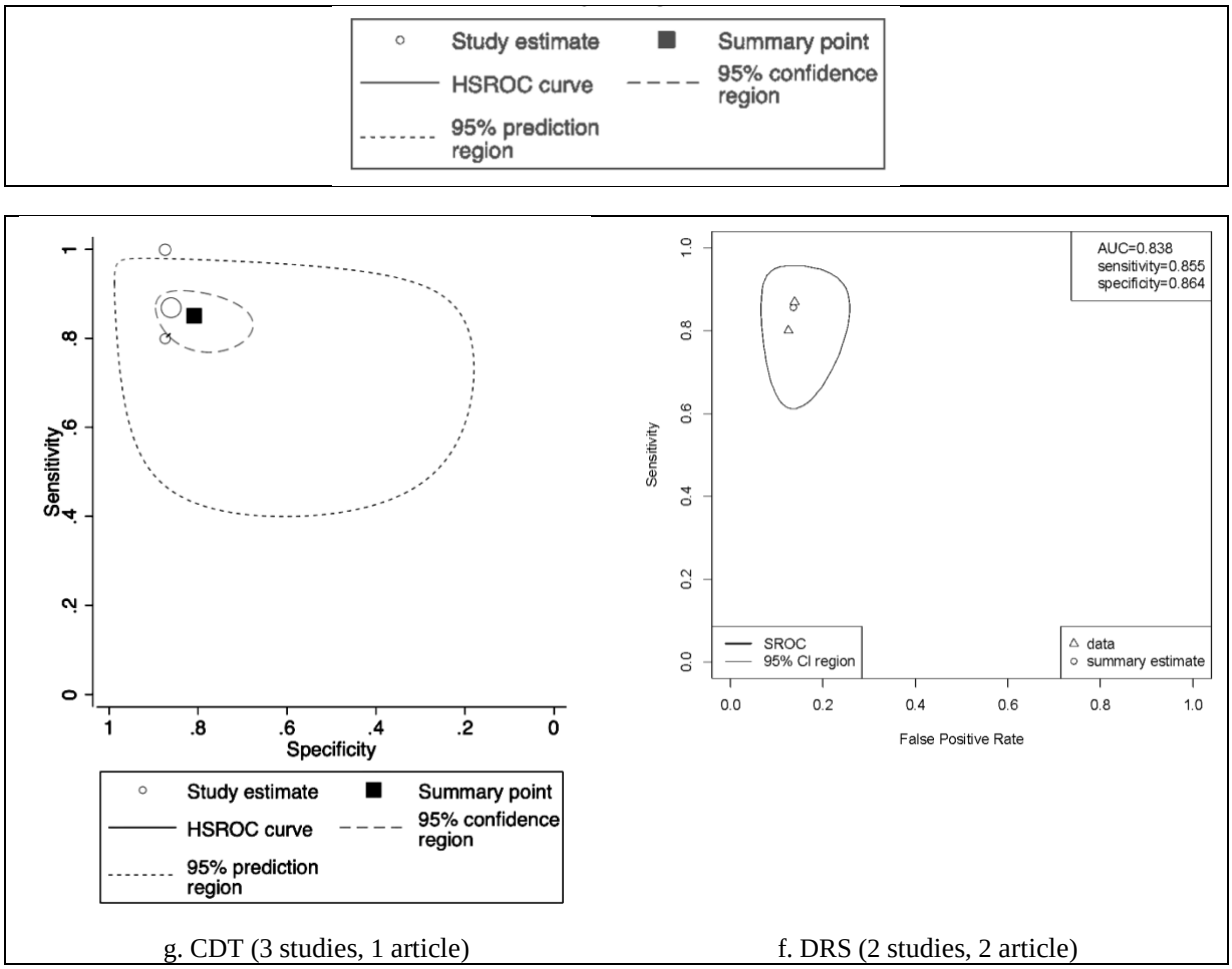
b. MMSE (14 studies, 11 articles)

c. MoCA (19 studies, 10 articles)

d. MoCA-BC (6 studies, 2 articles)

e. STT-A (4 studies, 1 article)

f. STT-B (4 studies, 1 article)



g. CDT (3 studies, 1 article) f. DRS (2 studies, 2 article)

Addenbrooke's Cognitive Examination-Revised & III; CDT, Clock Drawing Test; DRS/MDRS, Mattis dementia rating scale-Chinese version; MMSE, Mini-Mental State Examination; MoCA, Montreal Cognitive Assessment (including different scoring systems); MoCA-BC, Montreal Cognitive Assessment Basic; STT, Shape Trail Test

Supplementary Table 7. Likelihood ratio regression based on bivariate models (clinical context)

Test - Disease classification		Where the controls were recruited (N)		Between-study heterogeneity (Tau^2)	Generalised Tau^2	Model comparison: χ^2 (p)
ACE (dementia)		**Clinic (2)**	**Community (2)**			
	Sensitivity	0.97 (0.90, 0.99)	0.91 (0.87, 0.94)	0.00	0.00 (χ^2 = 0.00, df = 3, p = 1.00)	3.19 (0.07)
	Specificity	0.86 (0.77, 0.91)	0.86 (0.80, 0.90)	0.00		0.00 (0.98)
MMSE (dementia)		**Clinic (5)**	**Community (3)**			
	Sensitivity	0.91 (0.85, 0.94)	0.95 (0.89, 0.98)	0.19	0.00 (χ^2 = 8.83, df = 3, p = 0.0317)	1.66 (0.20)
	Specificity	0.89 (0.82, 0.93)	0.92 (0.84, 0.96)	0.23		0.41 (0.52)
MMSE (MCI)		**Clinic (4)**	**Community (7)**			
	Sensitivity	0.76 (0.65, 0.84)	0.77 (0.69, 0.83)	0.19	0.05 (χ^2 = 113.33, df = 3, p = 0.00*)	0.01 (0.91)
	Specificity	0.72 (0.50, 0.87)	0.69 (0.51, 0.82)	0.85		0.09 (0.76)
MoCA (dementia)		**Clinic (2)**	**Community (5)**			
	Sensitivity	0.87 (0.72, 0.95)	0.94 (0.88, 0.97)	0.39	0.00 (χ^2 = 14.52, df = 3, p = 0.0023)	1.78 (0.18)
	Specificity	0.88 (0.68, 0.96)	0.96 (0.90, 0.98)	0.48		2.24 (0.13)
MoCA (MCI)		**Clinic (3)**	**Community (7)**			
	Sensitivity	0.88 (0.76, 0.95)	0.79 (0.68, 0.87)	0.43	0.08 (χ^2 = 25.96, df = 3, p = 0.00*).	1.58 (0.21)
	Specificity	0.81 (0.69, 0.89)	0.79 (0.71, 0.85)	0.22		1.14 (0.71)

ACE, Addenbrooke's Cognitive Examination-Revised & III; MMSE, Mini-Mental State Examination; MoCA, Montreal Cognitive Assessment (including different scoring systems); MCI, mild cognitive impairment

Supplementary Table 8. Likelihood ratio regression based on bivariate models (population)

Test		Population (N)		Between-study heterogeneity (Tau^2)	Generalised Tau^2	Model comparison: χ^2 (p)
ACE		**China (3)**	**Others (3)**			
	Sensitivity	0.91 (0.86, 0.94)	0.96 (0.90, 0.99)	0.00	0.00 (χ^2=0.00, df=3, *p*=1.00)	2.66 (0.10)
	Specificity	0.84 (0.79, 0.88)	0.90 (0.82, 0.95)	0.00		2.00 (0.16)
MMSE		**China (9)**	**Others (10)**			
	Sensitivity	0.83 (0.73, 0.89)	0.87 (0.80, 0.92)	0.57	0.41 (χ^2 = 212.64, df = 3, *p* = 0.00*)	0.68 (0.41)
	Specificity	0.70 (0.56, 0.81)	0.88 (0.80, 0.93)	0.79		5.74 (0.02*)
MoCA		**China (3)**	**Others (14)**			
	Sensitivity	0.86 (0.69, 0.94)	0.88 (0.82, 0.92)	0.69	0.26 (χ^2= 91.10, df = 3, *p* = 0.00*)	0.14 (0.71)
	Specificity	0.77 (0.58, 0.89)	0.89 (0.83, 0.93)	0.60		2.65 (0.10)

ACE, Addenbrooke's Cognitive Examination-Revised & III; MMSE, Mini-Mental State Examination; MoCA, Montreal Cognitive Assessment (including different scoring systems)

Supplementary Table 9. Likelihood ratio regression based on bivariate models (subtype)

Test		Subtype (N)		Between-study heterogeneity (Tau^2)	Generalized Tau^2	Model comparison: χ^2 (p)
MMSE (dementia)		**AD (3)**	**non-AD (5)**			
	Sensitivity	0.96 (0.89, 0.98)	0.90 (0.85, 0.94)	0.18	0.02 (χ^2 = 7.04, df = 3, *p* = 0.0708)	2.21 (0.14)
	Specificity	0.93 (0.87, 0.96)	0.87 (0.80, 0.92)	0.19		1.99 (0.16)
MMSE (MCI)		**MCI (9)**	**Others (2)**			
	Sensitivity	0.80 (0.76, 0.83)	0.60 (0.50, 0.69)	0.03	0.00 (χ^2 = 56.10, df = 3, *p* = 0.00*)	10.23 (0.00*)
	Specificity	0.66 (0.52, 0.78)	0.85 (0.63, 0.95)	0.68		2.16 (0.14)
MoCA (dementia)		**AD (3)**	**non-AD (4)**			
	Sensitivity	0.93 (0.84, 0.97)	0.92 (0.83, 0.97)	0.48	0.00 (χ^2 = 13.89, df = 3, *p* = 0.0031*)	0.04 (0.84)
	Specificity	0.93 (0.82, 0.97)	0.95 (0.88, 0.98)	0.61		0.37 (0.54)

MMSE, Mini-Mental State Examination; MoCA, Montreal Cognitive Assessment (including different scoring systems); MCI, mild cognitive impairment

Supplementary Table 10. Likelihood ratio regression based on bivariate models (reference standard)

Test		Reference standard (N)		Between-study heterogeneity (Tau^2)	Generalized Tau^2	Model comparison: χ^2 (p)
MMSE (dementia)		**DSM (6)**	**Others (2)**			
	Sensitivity	0.93 (0.88, 0.96)	0.90 (0.78, 0.96)	0.22	0.00 (χ^2 = 9.35, df = 3, p = 0.0250*)	0.32 (0.57)
	Specificity	0.90 (0.83-0.94)	0.90 (0.79, 0.96)	0.29		0.01 (0.92)
MMSE (MCI)		**Peterson (9)**	**Others (2)**			
	Sensitivity	0.76 (0.69, 0.81)	0.80 (0.65, 0.90)	0.19	0.00 (χ^2 = 109.48, df = 3, p = 0.0000*)	0.38 (0.54)
	Specificity	0.66 (0.51, 0.78)	0.88 (0.62, 0.97)	0.78		2.53 (0.11)
MoCA (MCI)		**Peterson (6)**	**Others (4)**			
	Sensitivity	0.85 (0.76, 0.91)	0.78 (0.60, 0.89)	0.48	0.07 (χ^2 = 33.69, df = 3, p =0.00*)	0.88 (0.35)
	Specificity	0.76 (0.69, 0.82)	0.86 (0.77, 0.91)	0.14		3.09 (0.08)

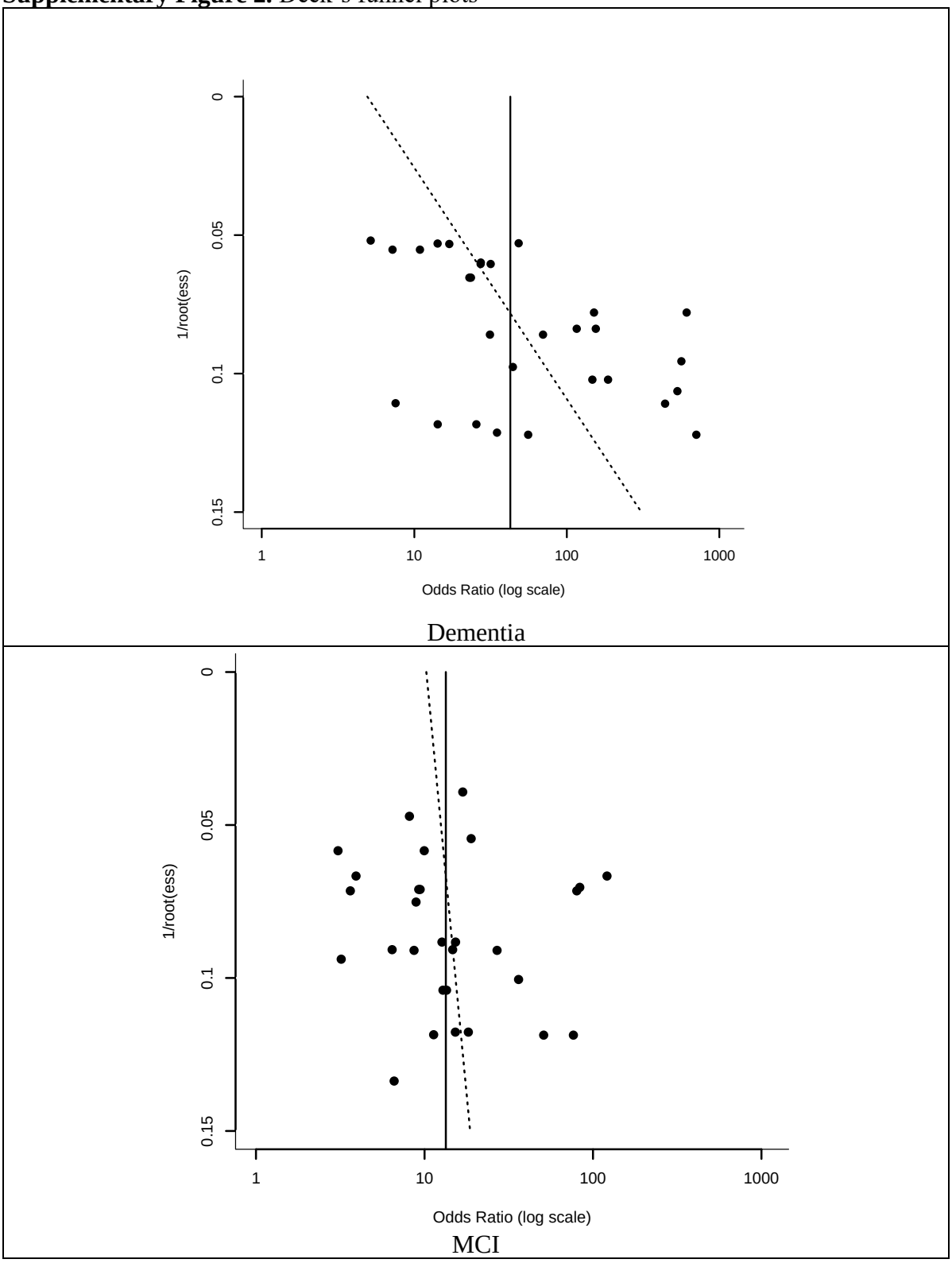
MMSE, Mini-Mental State Examination; MoCA, Montreal Cognitive Assessment (including different scoring systems); MCI, mild cognitive impairment

Supplementary Table 11. Likelihood ratio regression based on bivariate models (scoring system)

Test		Scoring system (N)		Between-study heterogeneity (Tau^2)	Generalized Tau^2	Model comparison: χ^2 (p)
MoCA (dementia)		**Original (3)**	**Adjusted (4)**			
	Sensitivity	0.96 (0.91, 0.99)	0.88 (0.81, 0.93)	0.16	0.00 (χ^2 = 3.23, df = 3, *p* = 0.3578)	4.38 (0.04*)
	Specificity	0.98 (0.95, 1.00)	0.89 (0.84, 0.93)	0.05		9.59 (0.00*)
MoCA (MCI)		**Original (5)**	**Adjusted (5)**			
	Sensitivity	0.76 (0.62, 0.86)	0.88 (0.78, 0.93)	0.41	0.08 (χ^2 = 31.83, df = 3, *p* = 0.00*)	2.76 (0.10)
	Specificity	0.79 (0.70, 0.86)	0.80 (0.71, 0.87)	0.23		0.03 (0.87)

MoCA, Montreal Cognitive Assessment. MCI, mild cognitive impairment

Supplementary Figure 2. Deek's funnel plots



MCI, mild cognitive impairment

Supplementary Table 12. The administration time and cognitive domains of all tests

	Test name and settings (A/B)	Code	Time (min)	Five cognitive domains of DSM-V					Brief instruction	Performance (<75%=unacceptable, 75-90%= satisfactory, > 90% =excellent)
				A	E	M	L	P		
1	ACE-III, ACE-R (A,B)	C9, C10, H3, T1	16-24	●	●	●	●	●	ACE-III was designed to remove some items of MMSE and replaced the verbal repetition items of ACE-R. Both have a maximum score of 100, with higher scores meaning better functioning.	*Please refer to the results of meta-analysis.*
2	AFT (B)	C11	1				●		It requires the participant to say the name of animals within 60 seconds, the more the better.	It had a satisfactory performance in recognizing patients with AD [25]
3	BHT-cog (B)	T6	4	●		●	●		It was developed indigenously in Taiwan, the second part of BHT, including orientation to time, immediate and delayed recall, categorical verbal fluency test, and CDT.	It had excellent sensitivities in detecting patients with MCI and dementia, while its specificities were satisfactory and unacceptable in detecting dementia and MCI, respectively [26]
4	BNT (B)	C12	≈ 15*				●	●	It asks the participant to name each object correctly within 20 seconds. Semantic cues will be given if they provide any wrong answer. If still wrong, they will be asked to select an answer on the correct "name", "name in the same category", and "name in similar quality/condition"	Its sensitivities were satisfactory, excellent, and unacceptable in recognizing patients with mild, moderate AD, and aMCI, respectively, while the specificities were all satisfactory [27]
5	CDT (including CDT command & copy) (A)	H1, T2, T3	1.5	●	●			●	A typical CDT test asks the participant to view the circle as a clock face and complete it by drawing "3:00". CDT-command asks the participant to draw a clock that reads "1:50". CDT-copy asks them to place the 12, 6, 3, and 9 first, then the rest of clock numbers.	*Please refer to the results of meta-analysis.*
6	CFT-C (B)	C19	10*	●	●			●	It has been widely used to assess the visuo-constructional ability and visual memory with applying copying (CFT-C) and recall subtests. It is less affected by language and culture.	The CFT-C's sensitivity was unacceptable while specificity was satisfactory when detecting patients with MCI and AD [19]
7	CVVLT (B)	T7	NA			●			It consists of 9 two-character nouns presented over 4 learning trials, followed by recall tests after 30-second, 10-minute, and a delayed word recognition test.	The performance of using this (total score) was excellent in recognizing AD patients whose age younger than 75, while the sensitivity dropped to only satisfactory for those who aged older than 75 [18]
8	DRS/MDRS (B)	C13, C14	15	●		●			It consists of 37 tasks and a total maximum score of 144, and the qualitative test result can show different types of dementia.	*Please refer to the results of meta-analysis.*
9	FAB-Phonemic (A)	C1	5		●				FAB-Phonemic is a new version of FAB, which replaced the original verbal fluency subtest with the Chinese phonemic fluency.	Its performances were satisfactory in detecting AD from the normal and nonamnestic MCI (naMCI), unacceptable in detecting aMCI from

										normal; AD from aMCI; naMCI from normal; and aMCI from naMCI [28]
10	FAB (B)	S2	5		●				It was developed for testing executive function at bedside and has been adapted to Asian context with the verbal fluency subtest being substituted by category fluency because of the differences in linguistics.	It had an excellent sensitivity and satisfactory specificity in detecting cognitive impairment (MCI and dementia) [29]
.12	HVLT (A)	C2	10*			●			It consists of three free recall trials and one recognition task, where the participant is asked to read aloud and freely recall the 12 words immediately after the examiner reads them, then recognize the 12 words from 24 words by saying “yes/no”.	Its total score was proved to have excellent performances in detecting patients with AD or dementia in different age groups, while it had an unacceptable performance in detecting patients with amnestic MCI (aMCI) [30]
13	JLO (B)	C19	15*					●	It is a 30-item test designed to simply measure visuospatial perception without involving constructional-motor demands, such as copying and assembling blocks.	The performances were unacceptable in detecting patients with MCI and AD [19]
14	M-ACE (A)	C3	<5	●			●	●	It was derived from the Addenbrookes Cognitive Examination-III (ACE-III) in 2015, including five subtests for four cognitive domains.	The sensitivity and specificity were excellent and satisfactory respectively in detecting individuals with mild dementia but were satisfactory and unacceptable for MCI [7]
15	Mini-Cog (A)	C4	3		●	●	●	●	It includes two tasks of three-word recall test and the clock drawing test (CDT).	Its performances were shown to be satisfactory in detecting patients with MCI [31]
16	MMSE (A,B)	C3, C7, H2, H3, H4, S4, T8, T10	10-15	●		●	●	●	It is composed of 11 items with a maximum score of 30, which is the best-known and most often used short cognitive assessments that measures various domains.	*Please refer to the results of meta-analysis*
17	MoCA (A,B)	C5, C6, C18, C19, H2, H4, S3, T4, T8, T9, T10	10-15	●	●	●	●	●	It includes 10 items in one page, with a maximum score of 30. There have been Mandarin, Putonghua and Cantonese Chinese version for use in Taiwan, Northern China and Hong Kong.	*Please refer to the results of meta-analysis*
18	MoCA-BC (B)	C15, C16, C17	15*	●	●	●	●	●	It takes less time than MoCA with a total number of tests reduced by 3. It also has a higher acceptability and sensitivity due to the change in some non-cognitive function tests.	*Please refer to the results of meta-analysis*
19	QCST (B)	C18	8-12	●	●	●	●	●	It comprises of several subtests, including word lists, naming test, AFT, similarity test, color trail test-1 min, CDT, finger construction test, digit span.	The sensitivity was unacceptable while specificity was excellent when detecting patients with MCI [13]
20	Qmci (B)	T10	<5	●	●	●	●	●	It based on the AB Cognitive Screen then added logical memory part and reweighted all the subtests.	Its sensitivities for recognizing dementia and specificity for recognizing MCI were excellent, while its specificities in recognizing dementia

										and its sensitivity in recognizing MCI were only satisfactory and unacceptable, respectively [32]
.21	RUDAS (A)	T5	10	●		●	●	●	It is a 6-item questionnaire designed to minimize the influence of cultural learning and language diversity Items include registration, body orientation, praxis, drawing, recall, and language.	For detecting dementia and MCI patients, the performances were satisfactory [33]
22	silhouettes test (B)	C19	3-5			●	●	●	It contains 15 animals and 15 inanimate drawings to measure the ability of identifying common objects depicted from atypical perspectives.	Its sensitivities were satisfactory, and the specificities were unacceptable in detecting patients with AD and MCI [19]
.23	SPMSQ (A)	S1	<5*	●		●			It is a 10-item instrument developed to measure orientation to time and place, memory, current event information, and calculation.	The performances of using this in recognizing patients with dementia in all education groups were satisfactory, only the specificity in detecting those who received fewer than six years of education was unacceptable [34]
24	STT-A (B)	C20	≈ 5	●			●		It needs drawing lines to connect 25 enriched numbers randomly arranged on a page in the correct order. Part A reflects language.	*Please refer to the results of meta-analysis.*
25	STT-B (B)	C19, C20	≈ 5		●	●			Part B depicts 1 to 25 twice in a circle and a square, asking participants to make lines alternating between circles and squares. It requires more visual perceptual processing ability than Part A and was developed to minimize the cultural bias.	*Please refer to the results of meta-analysis.*
26	T&C (A)	H1	≈ 1	●				●	It is a simple, rapid (45 seconds), and performance-based task related to real-world function, namely telling time and making change.	Its specificity was satisfactory while sensitivity was unacceptable in a study detecting a small number of patients with dementia in Hong Kong [9]
27	TMT (A)	C8	2.5-5		●				It includes TMT-A and TMT-B and mainly tests executive function. TMT-A consists of 25 consecutive numbers. TMT-B is 25 numbers enclosed in 13 circles and 12 squares, which has been culturally adapted for the Chinese population.	Both tasks showed a satisfactory performance in detecting patients with VaD, satisfactory sensitivity and excellent specificities in detecting patients with AD. The sensitivities were unacceptable, and the specificities were satisfactory in detecting patients diagnosed with MCI or vascular MCI (VaMCI) (except TMT-A for VaMCI was unacceptable) [35]
28	VCAT (B)	S4	15.7	●	●	●	●	●	It is a 11-item visual-based cognitive test for use in culturally diverse population without the need of further adaptation, measuring weighted more toward the episodic memory domain.	It had a satisfactory sensitivity and an unacceptable specificity in detecting cognitive impairment (MCI, AD) [36]

The codes starting with syllables of C, H, S, T refer to China, Hong Kong, Singapore, and Taiwan, respectively. The letters A, E, M, L, P of DSM-V refer to the cognitive domains of complex attention, executive function, learning and memory, language, perceptual-motor function, respectively. The setting of A / B refers to clinical or community-based controls, respectively. ACE-R&III, Addenbrooke's cognitive Examination Revised & III; AFT, Animal Fluency Test; BHT-cog, Brain Health Test-Cog part; BNT, Boston Naming

Test; CDT, Clock Drawing Test; CVVLT, Chinese version of the Verbal Learning Test; DRS/MDRS, Mattis dementia rating scale; FAB, Frontal Assessment Battery; HVLT, Hopkins Verbal Learning Test; M-ACE, Mini-Addenbrooke's Cognitive Examination; MMSE, Mini-Mental State Examination; MoCA, Montreal Cognitive Assessment; MoCA-BC, Montreal Cognitive Assessment Basic; QCST, Quick Cognitive Screening Test; Qmci, Quick Mild Cognitive Impairment Screen; RUDAS, Rowland Universal Dementia Assessment Scale; SPMSQ, Short Portable Mental Status Questionnaire; STT, Shape Trail Test; T&C, Time and Change Test; TMT, Trail-Making Test; VCAT, Visual Cognitive Assessment Test; *indicates that the information was obtained from other articles as the included articles did not specify; AD, Alzheimer's disease; QD, questionable dementia; VaD, vascular dementia; MCI, mild cognitive impairment; aMCI, amnestic MCI; naMCI, nonamnestic MCI; VaMCI, vascular MCI

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