

Appendix 10. Extensive results of studies on measurement properties

PROM – subscale	Country (language) in which the PROM was evaluated	Structural validity			Internal consistency			Cross-cultural validity\ measurement invariance			Reliability		
		n	Meth qual	Result (rating)	n	Meth qual	Result (rating)	n	Meth qual	Result (rating)	n	Meth qual	Result (rating)
DFS – Daily activities[34]	English, and other	326	Inadequate	Daily life (3 items) (?) and dependence (4 items) (?)	48	Inadequate	Daily activities: $\alpha^2=0.85$ (?)				?	Inadequate	Daily life: $r=0.68$ (-) Dependence: $r=0.84$ (+)
Pooled or summary result (overall rating)		326		Daily life (3 items) and dependence (4 items) (?)	48		Daily activities: $\alpha=0.85$ (?)				?	Very low	Daily life: $r=0.68$ (-) Dependence: $r=0.84$ (+)
DFS-SF study 1 – Dependence /daily life[35]	English, and other	180	Inadequate	Dependence/daily life (5 items): factor loadings 0.53-0.85; one cross-loader in whole instrument (?)	180	Very good	Dependence /daily life: $\alpha=0.88 - 0.91^b$ (+)				?	Inadequate	Dependence /daily life: $ICC=0.77$ (+)
DFS-SF study 2 – Dependence /daily life[35]	English, and other	347	Very good	Dependence/daily life (5 items): non-normed fit index = 0.93; CFI = 0.94; incremental fit index = 0.94; goodness of fit index = 0.87; RMSEA = 0.058 (+)	347	Very good	Dependence /daily life: $\alpha=0.85 - 0.88^c$ (+)				?	Inadequate	Dependence /daily life: $ICC=0.74$ (+)
DFS-SF Polish – Dependence	Polish				212	Very good	Dependence /daily life:	212	Inadequate	DIF in item 3c			

/daily life[36]							$\alpha=0.90 (+)$			for sex, (p-value Chi2 = 0.02) 6 variables were tested in 5 items (+)			
DFS-SF Chinese – Dependence /daily life[37]	Hong Kong Chinese				60	Very good	Dependence /daily life: $\alpha=0.89 (+)$						
DFS-SF Greek – Dependence /daily life[38]	Greek				110	Very good	Dependence /daily life: $\alpha=0.87 (+)$						
DFS-SF Spanish – Dependence /daily life[39]	Spanish	141	Inade quate	Dependence/ daily life (5 items): CFA: CFI = 0.844; RMSEA = 0.095; SRMR = 0.093 (-) EFA: 65.5% total variance explained; dependence/ daily life scale: factor loadings 0.58- 1.00 (+)	141	Very good	Dependence /daily life: $\alpha=0.87 (+)$				141	Doubtful	Dependence /daily life: ICC cons=0.77 (+)
Pooled or summary result (overall rating)		347	High	Dependence/ daily life (5 items) (+)	105 0	High	Dependence /daily life: $\alpha=0.85-0.91$	212	Very low	DIF for sex in one item	>141	Low	Dependence /daily life: ICC=0.74-0.77 (+)

							(+)			(+)			
PRO-DM-Thai – Physical function[40]	Thai	500	Very good	Physical function (5 items): Goodness-of-Fit index 0.998; Adjusted Goodness-of-Fit index 0.991; RMSEA: 0.000 (+)	500	Very good	Physical function: $\alpha=0.82$ (+)						
Pooled or summary result (overall rating)		500	High	Physical function (5 items) (+)	500	High	Physical function: $\alpha=0.82$ (+)						
IWADL/APPADL – (Physical) activities of daily living[41]	English	349	Doubtful	(physical) activities of daily living (7 items): 73% variance explained; factor loadings 0.82-0.90; eigenvalue 5.1 (+)	349	Very good	(physical) activities of daily living: $\alpha=0.94$ (+)						
IWADL/APPADL – (Physical) activities of daily living[42]	English				106	Very good	(physical) activities of daily living: $\alpha \geq 0.89^d$ (+)				106	Adequate	(physical) activities of daily living: ICC agr=0.91 (+)
Pooled or summary result (overall rating)		349	Low	(physical) activities of daily living (7 items) (+)	455	Low^e	(physical) activities of daily living: $\alpha \geq 0.89$ (+)				106	Moderate	(physical) activities of daily living: ICC agr=0.91 (+)
QOLID – Physical	English/Hindi	150	Inadequate	Physical endurance (6	150	Very good	Physical endurance:						

<i>endurance</i> [43]				items): 5.9%variance explained (total 49.9%); factor loadings 0.52 – 0.72 (+)			$\alpha=0.85$ (?)						
Pooled or summary result (overall rating)		150	Very low	Physical endurance (6 items): (+)	150		Physical endurance: $\alpha=0.85$ (?)						
DQLCTQ – <i>Physical function</i> [44]	English, German, French				909	Doubtful	Physical function: $\alpha=0.85$ (?)				58	Adequate	Physical function: ICC=0.83 (+)
Pooled or summary result (overall rating)					909		Physical function: $\alpha=0.85$ (?)				58	Low	Physical function: ICC=0.83 (+)
Diabetes-39 – <i>Energy and mobility (pilot version - 14 items)</i> [45]	English	516	Adequate	Energy and mobility (14 items): Seven factors with eigenvalue >1; 77% total variance explained; item loadings >0.50 (+)	516	Very good	All subscales: $\alpha=0.81-0.92$ (+)						
Pooled or summary result (overall rating)		516	Mode rate	Energy and mobility (14 items) (+)	516	Mode rate^e	All subscales: $\alpha=0.81-0.92$ (+)						
Diabetes-39 – <i>Energy and mobility (15 items)</i> [45]	English	427	Adequate	Energy & mobility (15 items): Five factors with eigenvalue >1;	427	Very good	Energy and mobility: $\alpha=0.93$ (+)						

				90% total variance explained; items loadings >0.50 (+)									
Diabetes-39 Arabic – <i>Energy and mobility</i> (15 items)[46]	Arabic	368	Doubtful	Energy & mobility (15 items): 83% total variance explained; item-scale correlations >0.40 (+)	368	Very good	Energy and mobility: $\alpha=0.89$ (+)						
Diabetes-39 Vietnamese – <i>Energy and mobility</i> (15 items)[47]	Vietnamese				286	Very good	Energy and mobility: $\alpha=0.92$ (+)				286 ^b	Doubtful	Energy and mobility: ICC=0.91 (+)
Diabetes-39 Portuguese – <i>Energy and mobility</i> (15 items)[48]	Portuguese				52	Very good	Energy and mobility: $\alpha=0.79$ (+)						
Diabetes-39 Spanish – <i>Energy and mobility</i> (15 items)[49]	Spanish				249	Very good	Energy and mobility: $\alpha=0.92$ (+)				249	Doubtful	Energy and mobility: spearman $r=0.84$ (+)
Diabetes-39 Taiwan – <i>Energy and mobility</i> (15 items)[50]	Chinese				280	Very good	All subscales: $\alpha=0.82-0.93$ (+)						
Diabetes-39 Taiwan –	Chinese	265	Adequate	Energy and mobility (15									

<i>Energy and mobility (15 items)</i> [51]				items): CFI: 0.92; TLI: 0.98; RMSEA: 0.085 (+)									
Pooled or summary result (overall rating)		1060	High	Energy and mobility (15 items) (+)	1662	High	Energy and mobility: $\alpha=0.79-0.93$ (+)				535	Moderate	Energy and mobility: spearman $r=0.84$, ICC=0.91 (+)
Diabetes-39 Thai – <i>Energy and mobility (10 items)</i> [52]	Thai	397	Adequate	Energy and mobility (10 items): Factor loadings 0.28-0.80; 1 cross-loader in scale; total variance explained 62.1% (-)	397	Very good	Energy and mobility: $\alpha=0.94$ (?)						
Pooled or summary result (overall rating)		397	Mode rate	Energy and mobility (10 items) (-)	397		Energy and mobility: $\alpha=0.94$ (?)						
Diabetes-39 German – <i>Physical impairment (7 items)</i> [53]	German	144	Inadequate	Physical impairment (7 items): Factor loadings >0.50 (?)	144	Doubtful	Physical impairment: $\alpha=0.84$ (?)				72 ⁶	Doubtful	Physical impairment: 0.88 ^h (?)
Pooled or summary result (overall rating)		144		Physical impairment (7 items) (?)	144		Physical impairment: $\alpha=0.84$ (?)				72		Physical impairment: 0.88 (?)
Diabetes-39 SF – <i>Energy and mobility (5 items)</i> [51]	Chinese	265	Very good	Energy and mobility (5 items): CFI: 0.966; TLI: 0.993; RMSEA: 0.058 (+)									
Pooled or summary result		265	High	Energy and									

(overall rating)				mobility (5 items) (+)										
C-CWIS – Physical symptoms and everyday living[54]	Chinese	131	Adequate	Physical symptoms and everyday living (12 items): Factor loadings 0.53-0.78 (one item with loading 0.16 loaded on a different factor but was retained in its original factor); 39.4% variance explained (total 57.2%); eigen value 9.9 (+)	Pilot : 20 Formal: 131	Very good	Physical symptoms and everyday living: Pilot: $\alpha=0.73$ (+) Formal: $\alpha=0.92$ (+)							
Pooled or summary result (overall rating)		131	Moderate	Physical symptoms and everyday living (12 items): (+)	151	Moderate ^e	Physical symptoms and everyday living: $\alpha=0.73-0.92$ (+)							

Appendix 10. Continued

PROM – subscale	Country (language) in which the PROM was evaluated	Measurement error			Criterion validity			Hypotheses testing for construct validity a=comparison with other instruments b=comparison between subgroups			Responsiveness a=comparison to gold standard b=comparison with other instruments c=comparison between subgroups d=before and after intervention			
		n	Meth	Result (rating)	n	Meth	Result (rating)	n	Meth	Result	n	Meth	Result (rating)	

			qual			qual		qual	(rating)		qual		
DFS – <i>Daily activities</i> [34]	English, and other							a. 173 b. 102 ¹	a. Adequate b. Very good	a. Results in line with 4 hypos (4+); results not in line with 1 hypo (1-) b. No data provided (?)	c. 264	c. Doubtful	c. Results not in line with 2 hypos (2-)
Pooled or summary result (overall rating)								a. 173 b. 102	a. Moderate	a. 4+ and 1- (+) b. (?)	c. 264	c. Low	c. 2- (-)
DFS-SF study 1 – <i>Dependence /daily life</i> [35]	English, and other							a. 180	a. Adequate	a. Results in line with 2 hypos (2+); results not in line with 3 hypos (3-)	c. 180	c. Very good	c. Results not in line with 1 hypo (1-)
DFS-SF study 2 – <i>Dependence /daily life</i> [35]	English, and other							a. 347	a. Adequate	a. Results in line with 2 hypos (2+); results not in	c. 252	c. Very good	c. Results in line with 1 hypo (1+)

										line with 3 hypos (3-)			
DFS-SF Polish – <i>Dependence</i> <i>/daily life</i> [36]	Polish							a. 212 b1. 212 b2. 212	a. Very good b1. Inadeq uate b2. Doubtful	a. Results in line with 4 hypos (4+); results not in line with 3 hypos (3-) b1. Results in line with 1 hypo (1+); results not in line with 3 hypos (3-) b2. No data provided (?)			
DFS-SF Chinese – <i>Dependence</i> <i>/daily life</i> [37]	Hong Kong Chinese							a. 60 b. 60	a. Very good b. Very good	a. Results in line with 5 hypos (5+); results not in line with			

										2 hypos (2-) b. Results in line with 1 hypo (1+) ⁸ ; results not in line with 1 hypo (1-)			
DFS-SF Greek – <i>Dependence /daily life</i> [38]	Greek							a. 110 b. 110 ^j	a. Very good b. Very good	a. Results in line with 4 hypos (4+); results not in line with 3 hypos (3-) b. Results in line with 14 hypos (14+); results not in line with 1 hypo (1-)			
DFS-SF Spanish –	Spanish							a. 141	a. Adequa	a. Results in line	c. 141	c. Very good	c. Results in line with 1 hypo (1+)

<i>Dependence /daily life</i> [39]									te	with 4 hypos (4+); results not in line with 1 hypo (1-)				
Pooled or summary result (overall rating)									a. 1050 b. 170	a. High b. High	a. 21+ and 15-(±) b. 15+ and 2-(+)	c. 573	c. High	c. 2+ and 1-(±)
PRO-DM-Thai – <i>Physical function</i> [40]	Thai								b1. 200 b2. 200	b1. Inadequate b2. Very good	b1. Results not in line with 1 hypo (1-) b2. No data provided (?)			
Pooled or summary result (overall rating)									b. 200	b. Very low	b. 1-(-)			
IWADL/APPADL – <i>(Physical) activities of daily living</i> [41]	English								b. 349	b. Very good	b. Results in line with 12 hypos (12+); results not in line with 22 hypos			

										(22-)				
IWADL/APPAD L – (Physical) activities of daily living[42]	English	106	Doubtful	(physical) activities of daily living: SEM=6.3; SDC=17.5; MIC=9.8-13.6 ^k (-)							d. 40	d. Very good	d. Results in line with 2 hypos (2+); results not in line with 1 hypo (1-)	
Pooled or summary result (overall rating)		106	Low	(physical) activities of daily living: SEM=6.3; SDC=17.5; MIC=9.8-13.6^k (-)					b. 349	b. High	b. 12+ and 22- (±)	d. 40	d. Low	d. 2+ and 1- (±)
QOLID – Physical endurance[43]	English/Hindi ^f								a. 30 b. 210 ^l	a. Adequate b. Very good	a. Results in line with 3 hypos (3+); results not in line with 3 hypos (3-) b. Results not in line with 3 hypos (3-)			
Pooled or summary result (overall rating)									a. 30 b. 210	a. Very low b. High	a. 3+ and 3- (±) b. 3- (-)			

DQLCTQ – <i>Physical function</i> [44]	English, German, French							b. 942 m	b. Very good	b. Results in line with 1 hypo (1+); results not in line with 1 hypo (1-)	c. 328	c. Very good	c. Results not in line with 2 hypos (2-)
Pooled or summary result (overall rating)								b. 942	b. High	b. 1+ and 1- (±)	c. 328	c. High	c. 2- (-)
Diabetes-39 – <i>Energy and mobility (pilot version - 14 items)</i> [45]	English							b. 516	b. Adequa te	b. No data provided (?)			
Pooled or summary result (overall rating)								b. 516		b. (?)			
Diabetes-39 – <i>Energy and mobility (15 items)</i> [45]	English							a. 427 b. 427	a. Adequa te b. Doubtful	a. Results in line with 6 hypos (6+); results not in line with			

										4 hypos (4-) b. No data provided (?)			
Diabetes-39 Arabic – <i>Energy and mobility (15 items)</i> [46]	Arabic							a. 368	a. Adequate	a. Results in line with 2 hypos (2+); results not in line with 3 hypos (3-)			
Diabetes-39 Vietnamese – <i>Energy and mobility (15 items)</i> [47]	Vietnamese							b. 286	b. Very good	b. Results in line with 4 hypos (4+); results not in line with 6 hypos (6-) ¹²			
Diabetes-39 Portuguese – <i>Energy and mobility (15 items)</i> [48]	Portuguese							b. 52	b. Very good	b. No data provided (?)			
Diabetes-39 Spanish – <i>Energy and mobility (15</i>	Spanish							b. 249	b. Very good	b. No data provided (?)			

<i>items</i>][49]													
Diabetes-39 Taiwan – <i>Energy and mobility (15 items)</i>][50]	Chinese							a. 280 b. 280	a. Very good b. Very good	a. No hypos defined (?) b. Results in line with 7 hypos (7+); results not in line with 5 hypos (5-)			
Diabetes-39 Taiwan – <i>Energy and mobility (15 items)</i>][51]	Chinese												
Pooled or summary result (overall rating)								a. 795 b. 566	a. High b. High	a. 8+ and 7- (±) b. 11+ and 11- (±)			
Diabetes-39 Thai – <i>Energy and mobility (10 items)</i>][52]	Thai							a. 397 b. 397	a. Adequa te b. Very good	a. Results in line with 2 hypos (2+); results not in line with 3 hypos			

										(3-) b. Results in line with 4 hypos (4+); results not in line with 2 hypo (2-)			
Pooled or summary result (overall rating)								a. 397 b. 397	a. Moderate b. High	a. 2+ and 3-(±) b. 4+ and 2-(±)			
Diabetes-39 German – <i>Physical impairment (7 items)</i> [53]	German							a. 144 b. 144	a. Very good b. Very good	a. No hypos defined (?) b. Results in line with 4 hypos (4+)	d. 62-66	d. Doubtful	d. No data provided (?)
Pooled or summary result (overall rating)								a. 144 b. 144	b. High	a. (?) b. 4+ (+)	d. 62-66		d. (?)
Diabetes-39 SF – <i>Energy and mobility (5 items)</i> [51]	Chinese												

Pooled or summary result (overall rating)													
C-CWIS – <i>Physical symptoms and everyday living</i> [54]	Chinese							a. 131 b. 131	a. Inadeq uate b. Inadeq uate	a. No data provided (?) b. Result in line with 1 hypo (1+)			
Pooled or summary result (overall rating)									b. Very low	a. (?) b. 1+ (+)			

a α refers to Cronbach's alpha; b Four moments of measurement; c Three moments of measurement; d Three moments of measurements; T1: n=119, T2: n=106, T3: n=40; e Per protocol of the COSMIN guideline for systematic reviews: the quality of evidence for internal consistency cannot be higher than the quality of evidence for structural validity[23]

f Language unsure; g Sample size unsure; h Reliability parameter unknown; i One of the known-groups tested in the hypotheses was small (n=10); j Some of the known-groups tested in the hypotheses were small (n<10); k MIC based on ability to perform daily physical activities and MIC based on weight loss, respectively; l n=60 for HbA1C levels; m n=274 for HbA1C levels; n One of the known-groups tested in the hypotheses was small (n=14)