Supplementary Material One

Search Terms:

Pubmed

- (((Participation[Title/Abstract]) AND (Disability[Title/Abstract])) AND (Assessment[Title/Abstract] OR "Outcome measure"[Title/Abstract] OR test[Title/Abstract])) AND (Sport[Title/Abstract] OR Physical[Title/Abstract] OR Recreation[Title/Abstract])

Sportdiscus

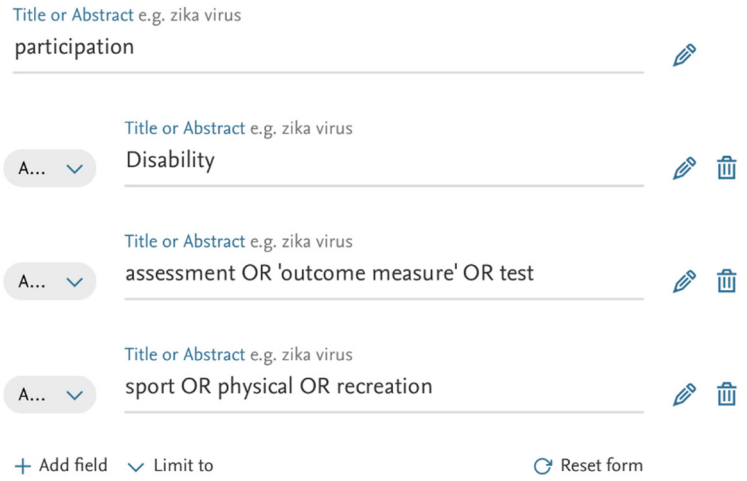
- AB participation AND AB disability AND AB (Assessment OR "outcome measure" OR test) AND AB (Sport OR physical OR recreation)

Cinahl

- AB Participation AND AB disability AND AB (Assessment OR "outcome measure" OR test) AND (Sport OR physical OR recreation)

Embase

- **participation**:ab,ti AND **disability**:ab,ti AND (**assessment**:ab,ti OR **'outcome measure'**:ab,ti OR **test**:ab,ti) AND (**sport**:ab,ti OR **physical**:ab,ti OR **recreation**:ab,ti)



Supplementary Table 1. Excluded Assessments

Reason for exclusion	Assessment
Not participation (activity)	Activity Scale for Kids Assessment of Life Habits School Functional Assessment (Part 2-3) Pediatric Evaluation of Disability Inventory (PEDI)
Not participation (preferences)	Preference of Activities for Children Pediatric Interest Profile ActiveYou
Not participation (quality of life)	CP Quality of Life
Only measures intensity of activity	Physical activity inventory for patients with spinal cord injury 7-Day Physical Activity Recall- only intensity of activity Australian Activity Survey- only intensity of activity Brunel lifestyle physical activity questionnaire Global physical activity questionnaire
<20% of items related to sport & physical recreation & no sport/physical recreation specific subscale	Adolescent & Young Adult Activity Card Sort (AYA-ACS) Child & Adolescent scale of Environment Child & Adolescent Scale of Participation (CASP) Children's Participation Questionnaire Children's Assessment of Participation with H&s

	Children Participation Assessment Scale in Activities Children Helping Out: Responsibilities, Expectations, & Supports Children's Occupational Performance Questionnaire Craig Hospital Inventory of Environmental Factors ICF Measure of Participation and ACTivities (IMPACT-S) Infant Toddler Activity Card Sort Meaningful Activity Participation Assessment Participation & Environment Measure for Children & Youth (PEM-CY) / Youth & Young Adults (Y-PEM) Physical Activity Recall Assessment Picture my Participation Preschool-age Physical Activity Questionnaire Questionnaire of Young People's Participation (QYPP) School Functional Assessment (Part 1)
Did not specify physical activities beyond categories of intensity of PA	Activity monitors (e.g., accelerometers) Godin Leisure-Time Exercise Questionnaire International Physical Activity Questionnaire (long & short form) Leisure Time Physical Activity Questionnaire for People with Spinal Cord Injury Morgenstern Physical Activity Questionnaire Physical Activity Scale for Individuals with Physical Disabilities Physical Activity Recall Assessment for People with Spinal Cord Injury Rapid Assessment of Physical Activity Stanford Brief Activity Survey
Not evaluated in sport/ physical recreation context	Leisure Participation Assessment Pittsburgh Rehabilitation Participation Scale (PRPS)
No psychometric data for children or youth with disability	Activity Card Sort, 2nd edition Activity Questionnaire for Adults and Adolescents (AQuAA) Baecke Questionnaire Minnesota Leisure Time Physical Activity Questionnaire Physical Activity & Disability Scale (PADS18) Physical Activity Scale for the Elderly Short Questionnaire to assess health-enhancing physical activity Yale Physical Activity Survey
Assessment unable to be obtained in English	Activity Participation Assessment Assessment of Preschool Children's Participation Motivation Scale for Sports Participation of People with Disabilities (MSSPPD) The Activities Questionnaire

Supplementary Table S2. Validity of Assessments of Participation in Sports & Physical Recreation for People with Disabilities [COSMIN score]

	Content & Structural validity [evidence direction & level]	Construct validity [evidence direction & level]	Cross-cultural validity [evidence direction & level]
Assessment of attendance & involvement			
CAPE	[+ Doubtful] Interview with 14 children with autism & 13 TD children. Two new items identified: "going online" & "inventing things" Children asked to explain how they knew their response. 3/14 guessed or didn't know. 3/14 parents disagreed with child's answer [1]. [+ Doubtful] Eleven professionals with extensive knowledge & experience with individuals with visual impairments & six dyads of parents & their child with a visual impairment assessed the accuracy of wording for 57 image descriptions & reached consensus in a two-round Delphi study [2]. [+Doubtful] Eight researchers & a parent of a child with CP evaluated semantic, idiomatic, experimental & conceptual adequacy of items. Content validity indexes were calculated [3]. [+Doubtful] Fifty-one TD children & 8 parents, & 12-18 children with disabilities & 4-6 parents participated in small group interviews to investigate the relevance of the activity items [4]. [+Doubtful] Parents of TD children & children with disabilities, three community recreation leaders, two occupational therapists & a psychologist assessed item appropriateness & relevance [5]. [+Inadequate] A physiotherapist, paediatrician, neurologist & rehabilitation sciences student & four TD students participated in focus groups regarding the relevance of items [6].	[+Very good] Compared to TD children, children with disabilities had lower total frequency & diversity but not enjoyment ($p<0.05$) [5]. [+Very good] Children with Down syndrome with higher motor & cognitive levels had higher CAPE frequency & diversity ($p=0.002$-0.004) & enjoyment ($p= 0.01$) [7]. [+Very good] Males with disabilities had higher frequency on the active physical subscale ($p=0.001$). Females with disabilities have higher frequency on the skill based subscale ($p=0.001$) [8]. [+Very good] CAPE scores (active physical scale frequency) associated with physical-structural environment (CHIEF), classmate support, family income, time constraints, general health (CHQ-50), athletic competence & physical & cognitive & communication functioning in children with disabilities ($p<0.01$). Frequency of skill-based activities associated with active-recreational & intellectual-cultural orientation ($p<0.01$). Boys participated in more active physical than girls. With older age, children participated in less recreational but more social activities [9]. [+Very good] Children with CP with higher IQ & motor function had higher frequency & intensity of participation on the active physical subscale ($p<0.001$). Children accessing rehabilitation services had greater frequency & intensity on the skill based subscale ($p=0.014$-0.015) [10]. [+Very good] Compared to TD children, children with physical disabilities had lower frequency & diversity of participation ($p=<0.05$) [11]. [+Very good] Compared to TD children, children with disabilities had lower frequency & diversity on active physical ($p<0.001$) but not skill-based subscale. Frequency, diversity & enjoyment associated with QoL ($p<0.05$) [12]. [+Very good] Compared to TD children, children with disabilities had lower diversity & intensity of participation in physical activities ($p<0.05$) [13]. [+Very good] Children with disabilities had lower frequency on the active physical & skill-based subscales than TD children ($p<0.001$) [14]. [+Very good] Compared to TD children, children with disabilities had lower total diversity & intensity but not enjoyment ($p<0.01$) [6]. [+Very good] Children with CP had lower frequency & diversity on the skill-based & active physical subscales than TD children ($p<0.001$) [15]. [+Very good] Children with SCI had higher frequency ($p<0.001$) & enjoyment ($p=0.046$) on the informal subscales, compared to formal. Frequency on the informal subscale was associated with age, sex & injury level. Intensity on the formal subscale was associated with age & caregiver education [16]. [+Very good] Compared to TD children, children with disabilities had lower diversity in active-physical & skill-based subscales ($p<0.001$) [17]. [+Very good] Compared to TD children, children with DCD had lower frequency & diversity but not enjoyment on the active physical subscale ($p<0.05$) [18]. [+ Very Good] Children with more significant neurological injury (SCI) had decreased total frequency & diversity of participation [19]. [+ Very Good] Overall participation diversity & intensity (overall) predicted by age ($p=.028$). Formal participation subscales predicted by GMFCS ($p=.001$-$.015$) [20] [+ Very Good] Children with poorer motor function (GMFCS) participated in less activities with friends & others ($P=0.01$-0.02) [21]. [+Very Good] Athletic competence correlated with the active physical subscale ($p<.01$). Boys participated more frequently than girls in physical activities ($p<.01$) [22]. [+ Very Good] Intensity of participation was associated with gross motor function, socialisation, communication & daily living skills ($p<.05$) [23]	[+Very good] Translation to/from Spanish. 7 experts assessed cultural relevance. Pilot tested with 7 children with CP & 7 TD children. Compared in a similar group to development (n=199) [12]. [+Adequate] Translation to Dutch. 9 experts (OTs, PTs & researchers) assessed cultural relevance & comprehensibility. Compared in a similar group to development (n=74) [14]. [+Adequate] Translation to/from Portuguese. Eight experts & one parent assessed cultural relevance. Pilot tested with eight children with CP & eight TD children. Compared in a similar group to development (n=69) [3]. [+Adequate] Translation to/ from Arabic. Five experts assessed cultural relevance. Pilot tested in 10 children. Compared in a similar group to development (n=75) [13]. [+Doubtful] Forward & back translation to Portuguese, tested on 5 students & discussed with 5 teachers. Five items removed. Then evaluated with 306 children without disabilities & 55 with disabilities [35]. [+Doubtful] Translated to/from Swedish. Three new items added, three items excluded [4]. [+Doubtful] Translated to Spanish. Two OTs, one psychologist & two other experts reviewed cultural relevance. Pilot tested with parents of disabled & TD children. Compared in similar group to development (n=51) [5]. [+Inadequate] Translation to/ from Greek. An OT, PT, psychologist & two recreational readers assessed cultural relevance. Pilot tested with 25 disabled & TD children for comprehensibility. Compared in a similar group to development (n=49) [11].

		[+/-Very good] Compared to TD children, children with autism had lower frequency & diversity on active physical but not skill based subscales, & no difference in enjoyment (p<0.001) [24]. [+/-Very good] Compared to TD children, children with ADHD had lower frequency of participation in the skill-based but not active physical subscale (p<0.05) & lower enjoyment in formal activities (p<0.05) [25]. [+/-Very good] Compared to TD children, children with CP had lower diversity but not intensity or enjoyment on the active physical & lower intensity but not diversity or enjoyment on skill-based subscale (p<0.05) [26]. [+/-Very good] Compared to older children, children with CP 6-12yrs had higher frequency but not diversity or enjoyment on the skill-based (p=0.0001) & diversity & enjoyment but not frequency on the active physical subscale (p=0.01-0.06) [27]. [+/-Very good] Compared to TD children, children with ID had lower diversity & frequency (p<0.05) but not enjoyment on skill-based & lower diversity (p<0.05) but not frequency or enjoyment on active physical subscale (p>0.05) [28]. [+/-Very good] Compared to TD children, children with DMD had lower frequency on the active physical subscale (p<0.001). There was no difference on the active physical subscale between boys <10 & >10yrs (p>0.05) [29]. [+/-Very good] Compared to TD children, children with CP demonstrated lower diversity & frequency (p=0.001) on active physical but not skill-based subscales. Total enjoyment associated psychological well-being [3]. [+/- Very Good] Overall & skill-based participation diversity but not active recreation was associated with disability severity (p<.01), Compared to girls, boys scored higher in active physical subscale (p<.01). Children with multiple disabilities were less likely to participate in formal activities (p<.01) [30]. [+Doubtful] Compared to girls, boys with disabilities had higher frequency on the active physical subscale & lower frequency on the skill-based subscale (p<0.05). Compared to younger children, children 14–17 years had lower frequency in the physical & skill-based activities (p=0.025) [31]. [+Doubtful] Gender related to Physical & Skill-based subscale score (p<0.05) [32]. [+/-Doubtful] Compared to TD children, children with disabilities had lower diversity & frequency (p<0.05) but not enjoyment on the skill-based scale & lower frequency (p<0.001) but not diversity or enjoyment on the active physical scale [33]. [+/-Doubtful] Compared to TD children, children with DCD had less diversity (p<0.01) & intensity (p<0.05) but not enjoyment in active physical subscale & lower diversity (p<0.01) but not frequency or enjoyment in the skill-based subscale [34].	[+Inadequate] Translation to/from German. A PT, paediatrician, neurologist, & rehab student assessed cultural relevance. Pilot tested with four TD children. Compared in similar group to development (n=32) [6]. [+Inadequate] Translation to/from Norwegian. Four experts assessed cultural relevance. Compared in similar group to development (n=34) [36].
Assessment of attendance			
CLASS	[+Very Good] Five OT's concluded content validity. Five parents reported items were clearly written. Items done by <20% of children eliminated. Factor Analysis identified four distinct factors- Instrumental Indoor Activities, Outdoor Activities with friends or family members, Self-Enrichment Activities & games & Sports Activities. Remaining 10 activities were eliminated [37].	[+Very good] Autistic boys & girls differed in participation variety (p<0.001), frequency (p<0.001) & preferences (p=0.002) [37]. [+Very good] Compared to children with TD, children with DCD had lower overall participation diversity (p<0.0001) & frequency (p=0.003) [38]. [+Doubtful] Compared to children with TD, children with physical disabilities had lower total frequency & diversity (p<0.05) [39].	No studies met inclusion criteria.
LAI	No studies met inclusion criteria.	[+Very good] People with ID & CP participate in more social than leisure activities which are done more than physical activities (p<0.001) [40]. [+Very good] Diversity is associated with personal development (p<0.05), self-determination (p<0.01) & social inclusion (p<0.01) (GENCAT) [41]. [+Very good] Subjective participation experience correlated with QoL (p>0.05) [42].	[+Very good] Translation to/from Spanish. Four experts assessed cultural relevance. Pilot tested in 15 adults with ID. Compared in similar group to development, n= 231 [41].
PACS	No studies met inclusion criteria.	[-Very good] Compared to TD children, children with CP (GMFCSI-II) did not have any difference in diversity on the sport subscale (p>.05) [43].	No studies met inclusion criteria.
Pre-ACS	[+ Doubtful] Parents used time logs to identify activities which were categorised by a review of the literature & a subsequent activity list created by two grad students & first author. Ten therapists & ten	[+ Very Good] PAQ scores associated with QoL overall (p<.001) & physical (p<.001), social (p=.022) & psychosocial (p=.022) scales & happiness (p=.015) [45].	No studies met inclusion criteria.

	parents of TD children assessed comprehensibility & relevance of photographs of activities [44].	[-/+Very Good] Compared to TD children, young children with CP demonstrated decreased overall & high-demand leisure participation (p<.001). MACS (p=.01) but not GMFCS was related to participation (p=0.07) [46].	
PAQ	No studies met inclusion criteria.	[+Doubtful] Children with physical disability participated less in physical activity than children with intellectual disability (p < .01). Scores were positively associated with self-concept & QoL in both groups [47]. [+/- Doubtful] PAQ scores had little to no association with pedometry (r=0.24) or accelerometery (r=0.21), & little to good correlation with self-reported sedentary time (r=-0.03-0.51). PAQ scores associated with GMFCS for adolescents with CP (p<.01), who were less active than their TD peers [48].	No studies met inclusion criteria.
Assessments of involvement			
MEAP	[+Very good] Three rounds of factor analysis. All items <0.08 for SRMR & RMSEA & >0.90 for CFI & TLI [49]. [+Adequate] Literature review for items that measure experience of participation. Items reviewed by 10 sport, employment & mobility experts. Adults with disability tested comprehension [49].	[+Very good] Moderate to large positive associations across elements of the MEAP (r=0.39-0.59) [50].	No studies met inclusion criteria.
PES	[+ Doubtful] Six youth with disabilities identified elements of participation which were categorised & coded by research members. Caregivers of youth with developmental disability, allied health & education service providers & cognitive disability experts reviewed content & revised. Accessibility & feasibility evaluated with 8-10 youth with cognitive disabilities [51].	[+ Inadequate] Agreement on positive experiences between the PES & opportunities provided by the setting were high for an art & free swim program (r=0.73) & track & field practice (r=0.80) [52]	No studies met inclusion criteria.
SEAS	[+Adequate] Literature review of existing tools used to develop items. Five SP, OT & child psychiatrists reviewed items. Item relevance & compressibility reviewed by experienced teacher & five children with disability [53]. [Adequate+] Developed with graphic symbols for AAC users. Eleven SLP & communication assistance professionals & five adult AAC users found SEAS with SEAS-PCS equivalent [54]. [+Doubtful] Factor loading <0.50 excluded (12 items); 4/5 scales remained the same. Factor analysis identified five factors accounting for 61.9% of variance: Psychological Engagement, Social Belonging, Meaningful Interactions, Choice & Control & Personal Growth [53].	No studies met inclusion criteria.	[+ Inadequate] Translation to/from Polish. Intelligibility was reported by 89.3% of respondents [55]

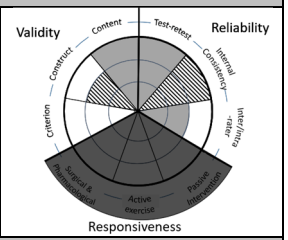
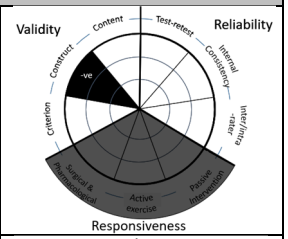
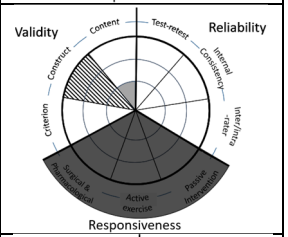
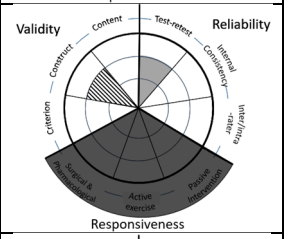
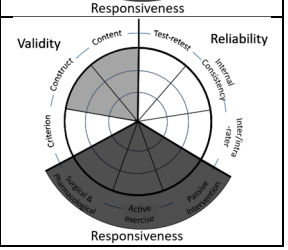
TD= Typically developing, OT= Occupational therapist, TBI=traumatic brain injury, CP= Cerebral palsy, PT= Physiotherapist, ADHD= Attention deficit hyperactive disorder, ID= intellectual disability, DMD= Duchenne's muscular dystrophy, DCD= developmental coordination disorder, SP= Speech pathologist, SRMR= Standardized Root Mean Square Residual, RMSEA= Root Mean Square Error of Approximation.

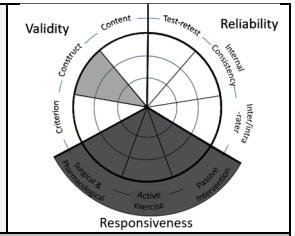
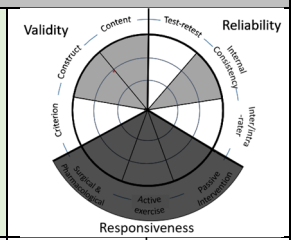
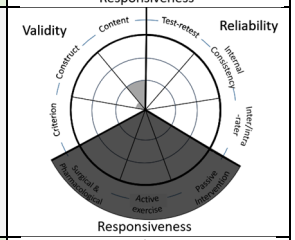
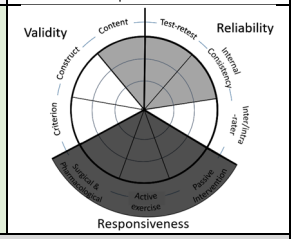
Supplementary Table S3. Reliability of Assessments of Participation in Sports & Physical Recreation for People with Disabilities [COSMIN score]

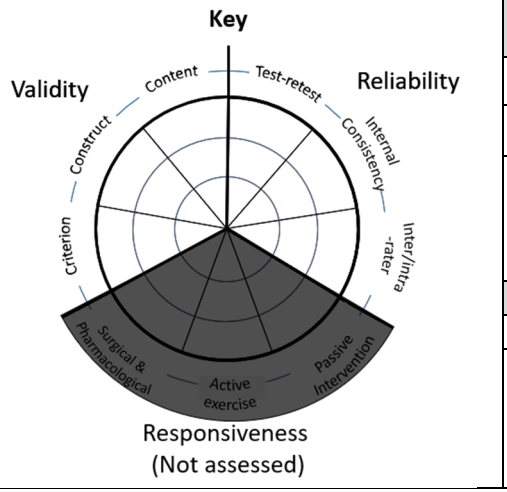
	Reliability	Internal consistency
Assessments of attendance & involvement		
CAPE	[+Very good] Test-retest reliability good for all subscales (ICC= 0.74-0.83) [3]. [+Very good] Test-retest reliability was moderate-good for all subscales for diversity (0.58–0.74) & moderate to excellent for intensity (ICC=0.65-0.82) [6]. [+Very good] Test-retest reliability was moderate-good for overall diversity (ICC=0.54), intensity (ICC=0.74), with whom (ICC=0.71), where (ICC=0.76) & enjoyment (ICC=0.80) [12]. [+Very good] Test-retest reliability was moderate-good for overall score (ICC=0.66) & moderate-excellent for all subscales (ICC=0.49-0.83) [36]. [+Adequate] Test-retest reliability moderate to excellent for overall diversity (ICC=0.733), frequency (ICC=0.752) & enjoyment (ICC=0.758) & all subscales (ICC=0.715-0.752) except social (r=0.196) [1]. [+ Adequate] Test-retest reliability was moderate to excellent for overall diversity (*r*= 0.67), intensity (*r*= 0.69), with whom (*r*= 0.58), where (*r*= 0.91), & enjoyment (*r* = 0.80) [56]. [+Adequate] Test-retest (ICC=0.61-0.78) & inter-rater reliability (0.65-0.83) moderate to good in all subscales [14].	[+/-Very good] Good IC for overall score (α= 0.79) & formal (α= 0.75) but poor for active physical (α= 0.48) & skill-based subscales (α=0.40) [3]. [+/-Very good] Good IC for overall score (α= 0.80) but poor for subscales (α>0.42) [6]. [+/-Doubtful] Good IC for overall score (α= 0.87) & acceptable (α= 0.71-0.73) for all but the Social & Self-Improvement subscales [36]. [+Doubtful] Good internal consistency for overall score (α=0.85) [5]. [+Inadequate] Good IC for overall score (α= 0.83) & physical (α= 0.83) & self-improvement (α= 0.73) subscales [13]. [-Inadequate] Poor to moderate IC of intensity for subscales (α= 0.08-0.64) [11].
Assessment of attendance		
CLASS	No studies met inclusion criteria.	No studies met inclusion criteria.
LAI	No studies met inclusion criteria.	No studies met inclusion criteria.
PACS	No studies met inclusion criteria.	No studies met inclusion criteria.
Pre-ACS	No studies met inclusion criteria.	No studies met inclusion criteria.
PAQ	[+Adequate] Test-retest reliability was fair to excellent for individual PAQ items (ICC=0.51-0.99), overall PA (ICC=0.90); sedentary items (ICC=0.3-0.95) & total weekly sedentary time (ICC=0.84) [48]	No studies met inclusion criteria.
Assessments of involvement		
MEAP	No studies met inclusion criteria.	[+Very good] Good IC for autonomy (α=0.78-0.85), belongingness (α=0.82-0.90), challenge (α=0.70-0.82), engagement (α=0.73-0.80), mastery (α=0.77-0.81), meaning (α=0.53-0.64) [49]. [+Adequate] Excellent IC for overall score (α=0.90) [50].
PES	No studies met inclusion criteria.	No studies met inclusion criteria.
SEAS	[+Very good] Personal growth (ICC=0.85), Psychological engagement (ICC=0.59), Social belonging (ICC=0.53), Meaningful interactions (ICC=0.94), Choice & control (ICC=0.51) [53].	[+Very Good] Good IC for Personal growth (α=0.86) Psychological growth (α = 0.88), Social belonging (α=0.78), Meaningful interaction (α=0.71), Choice & Control (α=0.78) [53]. [+Very Good] Excellent overall IC (α=0.953) [55]

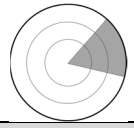
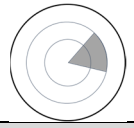
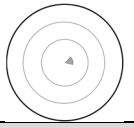
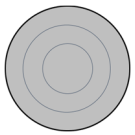
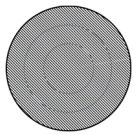
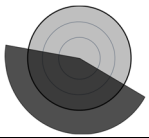
PT= Physiotherapist, OT=Occupational therapist, IC=Internal Consistency

Table S4. Summary of Psychometric Properties of Assessments of Participation in Sports & Physical Recreation for People with Disabilities.

	Validity						**Reliability**						**Visual Representation**
	Content		Construct		Cross-cultural		Test-retest		Inter/intra-rater		Internal consistency		
	+/-	COSMIN	+/-	COSMIN	+/-	COSMIN	+/-	COSMIN	+/-	COSMIN	+/-	COSMIN	
Assessments of Attendance & Involvement													
CAPE	+++	6 D	?	19E (+) 8E (+/-) 2D (+) 2D (+/-)	++++	1E 3A 3D 3I	++++	4E 3A	+++	1A	?	2E (+/-) 1D (+/-) 1D (+) 1I (+) 1I (-)	
Assessments of Attendance													
PACS			----	1E									
Pre-ACS	++	1D	?	1E (+) 1E (+/-)									
PAQ			?	1D (+) 1D (+/-)			+++	1A					
CLASS	++++	1E	++++	2E 1D									

LAI			++++	3E	++++	1E							
Assessments of Involvement													
MEAP	++++	1E 1A	++++	1E							++++	1E 1A	
PES	++	1D	+	1I									
SEAS	++++	2A 1D			+	1I	++++	1E			++++	2E	



Strength of Evidence			
High-level **(++++ or - - - -)**	***Moderate-level*** **(+++ or - - -)**	***Low-level*** **(++ or - -)**	***Very low-level*** **(+ or -)**
>1 excellent, or 2 adequate studies	1 adequate, or 2 doubtful studies	1 doubtful, or 2 inadequate studies	1 inadequate study
			
Direction of Evidence			
Sufficient/positive (+)	Insufficient/ negative (-)	*indeterminant/ conflicting (?)*	*Not evaluated*
			

E= Excellent, A= adequate, D= doubtful, I= inadequate

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