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Construct Validity of the Capacity Profile in Adolescents with Cerebral Palsy.

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Introduction:

❖Children with non-progressive developmental disabilities such as cerebral palsy (CP) often present with a variety of impairments that may lead to a lifelong need for additional care. For caregivers it is essential to be informed about the current and anticipated additional care needs.
❖The Capacity Profile (CAP) classifies these additional care needs indicated by the child's current impairments in the domains of body functions according to the International Classifcation of Functioning, Disability and Health (ICF): physical health, neuromusculoskeletal and movement-related, sensory, mental, and voice and speech functions.
❖The level of need for care in each domain is defined from 0 (no need for additional care) to 5 (needs help with every activity). Assessment of the intensity of need for additional care in each of the five domains, irrespective of the need for care in the other domains, results in the Capacity Profile for the individual child.
❖By scoring the dependence on additional care for each domain separately, insight is obtained regarding the contribution of additional care to the various domains of body functions.
❖The CAP has shown good interrater's reliability and stability in time in stable conditions, like CP.

Objective:

❖To establish the construct validity of the CAP in adolescents with cerebral palsy
❖We hypothesized that the need for additional care is significantly negatively associated with daily function of the child.

Subjects:

❖Ninety four adolescents with cerebral palsy: 60 boys, 34 girls, median age 14.3, range 12-16 years
❖Cerebral palsy: unilateral (n=37), bilateral (n= 57), spastic (n=76), ataxic (n=4), dyskinetic (n=5), mixed (dyskinetic and spastic, n=9)
❖Gross Motor Function Classification System: level I (n=50), level II (n=6), level III (n=10), level IV (n=8), level V (n=20).

Table 1: Characteristics of the participants

GMFCS level		unilateral	bilateral	spastic	ataxia	dyskinetic	mixed	mental retardation
1	(n=50)	36	14	45	3	1	1	2
2	(n=6)	1	5	4	1	0	1	2
3	(n=10)	0	10	9	0	0	1	2
4	(n=8)	0	8	7	0	0	1	5
5	(n=20)	0	20	11	0	4	5	17
Total	(n=94)	37	57	76	4	5	9	28

The columns show the distribution among the GMFCS levels of the type and distribution of the motor impairments, mental retardation is defined as an intelligence quotient below 70.

Table 3:

Correlations calculated with Spearman's Rho between Capacity Profile (CAP) domains, Gross Motor Function Classification System (GMFCS), and Vineland Adaptive Behavior Scales (VABS) domains (Communication, Daily Living Skills, Socialization and Motor Skills) in the study population of adolescents with cerebral palsy.

	GMFCS	VABS domain of Communication	VABS domain of Daily Living Skills	VABS domain of Socialization	VABS domain of Motor Skills
CAP physical	0.27**	-.33**	-.37**	-.24*	-.29**
CAP motor	0.98**	-.67**	-.77**	-.47**	-.89**
CAP sensory	0.34**	-.47**	-.42**	-.39**	-.40**
CAP mental	0.71**	-.86**	-.81**	-.70**	-.70**
CAP voice and speech	0.68**	-.73**	-.73**	-.58**	-.69**

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).

Methods:

❖Associations were calculated between CAP domains and activities and participation measured with the Vineland Adaptive Behavior Scales (VABS: domains of communication, daily living skills, socialization and motor skills) and the Gross Motor Function Classification System using Spearman's Rho.
❖Furthermore, we explored the independent contribution of the CAP domains to activities and participation measured with the Vineland Adaptive Behavior Scales.

Results:

❖All CAP domains were significantly associated with all domains of the Vineland Adaptive Behavior Scales and the Gross Motor Function Classification System (table 3).
❖Multiple regression analysis showed that the CAP contributed 87% to variance in communication, 85% to daily living skills, 60% to socialization, and 91% to motor skills (table 4).

Conclusion:

These findings support the construct validity of the CAP in adolescents with cerebral palsy. Construct validity in other medical conditions should be further investigated.

Table 2: Frequencies of the Capacity Profile (CAP) domains in the study population of adolescents with cerebral palsy.

Score	CAP-physical health	CAP-motor	CAP-sensory	CAP-mental	CAP-voice and speech
0	60	0	69	40	65
1	27	49	15	18	20
2	2	9	7	8	1
3	2	11	1	19	4
4	3	16	2	7	3
5	0	9	0	2	1

The columns show the frequencies of the CAP scores in each of the CAP domains: additional care in the domain of Physical Health, Neuromuscoloskeletal and Movement Related, Sensory, Mental and Voice and Speech functions. The CAP score varies from 0 (no need for additional care) to 5 (needs help with every activity).

Table 4:
Multiple regression models for the contribution of the Capacity Profile (CAP) domains independently to the Vineland Adaptive Behavior Scales (VABS) domains in the study population of adolescents with cerebral palsy.

	adj. R2	*Explained variance%*		*Unstandardized Coefficient Beta*	*SE*	*95% CI*		*p*	*Standardized Coefficient Beta*
Comm.	0.87	CAP-v	78	-13.95	1.64	-17.26	-10.7	0	-0.50
		CAP-me	8	-8.69	1.13	-10.97	-6.45	0	-0.48
		CAP-ph	1	-3.19	1.45	-5.98	-0.18	0.03	-0.10
Dail. act.	0.85	CAP-me	75	-12.74	1.93	-16.61	-8.89	0	-0.44
		CAP-mo	8	-11.24	1.7	-14.43	-7.63	0	-0.38
		CAP-v	2	-8.2	2.42	-13.73	-4.05	0.001	-0.20
Soc.	0.6	CAP-v	56	-12.54	2.48	-17.56	-7.64	0	-0.51
		CAP-me	4	-5.62	1.77	-9.4	-2.32	0.002	-0.32
Mot.skills	0.91	CAP-mo	88	-11.45	0.71	-12.87	-10.03	0	-0.75
		CAP-me	2	-2.9	0.77	-4.44	-1.36	0	-0.20
		CAP-s	1	-2.33	1.01	-4.35	-0.31	0.02	-0.09

VABS: Vineland Adaptive Behaviour Scales, CAP: Capacity Profile
The VABS domains Communication, Daily Activities, Social Skills and Motor Skills were introduced as dependent variables and the CAP domains Physical Health (CAP-ph), Neuromusculoskeletal and movement related functions (CAP-mo), Sensory Functions (CAP-s), Mental (CAP-me) and Voice/ Speech Functions (CAP-v) were included as independent variables.

Read more about the CAP:
❖Meester-Delver A, Beelen A, Hennekam R, Hadders-Algra M, Nollet F. Predicting additional care in young children with neurodevelopmental disability: a systematic literature review. Dev Med Child Neurol 2006; 48(2):143-150.
❖Meester-Delver A, Beelen A, Hennekam R, Nollet F, Hadders-Algra M. The Capacity Profile: a method to classify additional care needs in children with neurodevelopmental disabilities. Dev Med Child Neurol 2007; 49(5):355-360.
❖Meester-Delver A, Beelen A, Ketelaar M, Hadders-Algra M, Nollet F, Gorter JW. Construct validity of the Capacity Profile in preschool children with Cerebral Palsy. Dev Med Child Neurol 2009; 51(6):446-453.
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