


Cultural adaptation and reliability of the Turkish version of the Children's Assessment of Participation with Hands scale in children with physical disabilities

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To cite: Cetin SY, Tonak HA, Kaya Kara O, *et al*. Cultural adaptation and reliability of the Turkish version of the Children's Assessment of Participation with Hands scale in children with physical disabilities. *BMJ Paediatrics Open* 2025;**9**:e002879. doi:10.1136/bmjpo-2024-002879

Received 4 July 2024

Accepted 28 October 2024



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ABSTRACT

Background The 'Children's Assessment of Participation with Hands (CAP-H)' scale is a parent report questionnaire that can be used to measure participation in life situations that require hand use for children with disabilities. The aim of this study was to examine the reliability of a Turkish version of the CAP-H scale in order to evaluate the hand participation of children with physical disabilities and compare them with typically developing children.

Methods Evaluation was made of a total of 182 physically disabled children (8.53±3.94 years) and 90 typically developing children (9.40±3.04 years). The CAP-H scale was used to evaluate children's hand participation, compare with typically developing children and to examine the reliability of the Turkish version. Cronbach's alpha and intraclass correlation coefficients (ICCs) were evaluated for internal consistency and test-retest reliability, respectively.

Results Cronbach's alpha value used for all subscores was found to be excellent in all domains for internal consistency (Cronbach's α : 0.84–1). According to the test-retest reliability, it was found to be perfectly reliable in all domains (ICC: 0.81–1). There was a significant difference in all items of CAP-H ($p=0.00$) except for participation in self-care, frequency of recreational activities and frequency of educational domain in favour of typically developing children.

Conclusions The results of this study demonstrated that the Turkish translation of CAP-H is a reliable evaluation for children's participation in life requiring hand use. In addition, hand participation of children with physical disabilities is lower compared with typically developing children.

INTRODUCTION

The International Classification of Functioning, Disability and Health (ICF), which creates a common language for academics and researchers, has been developed in an expanded version for children and adolescents (ICF-CY) which focuses on children's participation.¹ According to the ICF-CY System, participation is defined as 'being

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ The 'Children's Assessment of Participation with Hands (CAP-H)' scale is a parent report questionnaire that can be used to measure participation in life situations that require hand use for children with disabilities. This scale needs to be translated into different languages to be used as an evaluation tool.

WHAT THIS STUDY ADDS

⇒ Turkish translation of CAP-H is a reliable evaluation for children's participation in life requiring hand use. In addition, hand participation of children with physical disabilities is lower compared with typically developed children.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ According to this study, hand participation of these children can be evaluated using the Turkish CAP-H scale and rehabilitation programmes that will increase hand participation can be planned.

included' in living conditions.² Many activities are carried out in daily living for which children should use their hands and arms to participate and perform these activities.^{3–5} It is necessary to use both hands while performing most activities, and how the hands are used, the role of the hand in the activity, and the mobility and strength of the hand are the variable aspects of the use of the hand.⁵ Hand use in children aged 5–12 years can vary according to intrinsic, environmental and task-related factors.⁶ In this context, children with disabilities have difficulty in using their hands in participating in daily living activities, which has the negative effect of preventing active participation.^{3,4} Chien *et al* stated that the studies generally evaluated manual skills and examined hand impairment,^{7,8} and the effect on participation of the difficulties

experienced by children should also be evaluated.⁷ These studies evaluating hand skills and hand disorders do not provide information about the functional level of the child, or participation in daily living activities and needs. Since daily life particularly involves hand use, a participation outcome measure used to evaluate the hand use intervention should also be included in routine evaluations.⁷

Recent developments in outcome scales have led to an increased examination of the level of participation in daily life activities and the degree of difficulty during activities have started to be examined.^{9–13} The ‘Children’s Assessment of Participation with Hands (CAP-H)’ scale, which was developed by Chien *et al*⁹ to evaluate children’s hand participation, is one of these assessment methods. The CAP-H is a parent report questionnaire that can be used to measure participation in life situations that require hand use for children with disabilities aged 2–12 years. The scale is used to obtain information about the life participation of children reported by families in four areas: self-care, entertainment, education and domestic life. In the original study, evidence was provided for construct validity, Rasch analysis, test–retest reliability and internal consistency. The study included 202 parents/caregivers who answered the questions, 97 children with disabilities and 105 non-disabled children aged 2–12 years. In this study, summary scores for all participation dimension scales showed moderate to high test–retest reliability (intraclass correlation coefficient (ICC): 0.69–0.96), and item reliability coefficients were acceptable in all dimensions/areas (0.78–0.96). It has also been stated that this scale, which evaluates children’s hand participation, can be used to help service providers and parents understand children’s participation in hand use and prioritise areas that require intervention.⁹

To the best of our knowledge, there is no Turkish validity and reliability scale that can reveal children’s hand involvement. In the study in which the CAP-H was developed, it was stated that this scale could be used in population-level research studies to examine the similarities and differences in children’s manual life participation among different diagnosis groups.⁹ It is very important to adapt translated assessment tools to different cultures and languages and to verify their reliability and validity.^{11 12} Moreover, self-report questionnaires are advantageous in that they can be used for large-scale testing.¹⁴ The aim of this study was to examine the discriminant validity and reliability of a Turkish version of the CAP-H’ scale in order to evaluate the hand participation of physically disabled children.

MATERIALS AND METHODS

Translation and cross-cultural adaptation

Permission was obtained from Dr. Will Chien, who was the head of the team that developed this scale, for the adaptation of CAP-H to Turkish, with a translation and validity process. In the adaptation of the CAP-H to Turkish, the

standard protocol of the WHO for the adaptation of the scales to different languages was applied.¹⁵ The forward and backward translation method was completed in six steps in the following order:

1. Translation of the scale into the target language (forward translation)

Two independent professionals translated the CAP-H into Turkish.

2. Review of the scale translated into the target language by an expert panel of two paediatric rehabilitation physiotherapists, who can speak both languages. At this stage, insufficient expressions and idioms were determined and resolved with the team and the final version of the scale was translated into Turkish.

3. Translation of the scale from the target language to the original language (back translation).

The scale was translated from Turkish back to the original English by an English native speaker who also can speak both languages fluently. At this stage, attention was paid to the conceptual and cultural equalisation of the translation, not its linguistic validity.

4. Testing the translated scale and discussing its conceptual integrity.

The translated scale was reviewed by the researchers who developed the scale through comparison with the original scale.

5. Final version of the adapted scale (final version)

The scale, which was evaluated by specialist physiotherapists with 10–15 years of experience in the field of paediatric rehabilitation at all stages, was corrected and finalised.

6. At the last stage, the final version of the scale was applied to the parents or caregivers of 40 children with physical disabilities to determine whether there were complex expressions or any difficulties in understanding the scale. As the scale was determined to be understandable by parents and caregivers, it was accepted in its final form.

Research design

This cross-sectional study was conducted in a single centre using the test–retest method. The study was conducted to determine the reliability of the Turkish version of the scale.

Patient and public involvement

Before starting the study, the children’s families were informed verbally. First, all volunteers at the centre were included in the study, then individuals who met the inclusion criteria were included in the study. The study was registered at the US National Library of Medicine ClinicalTrials.gov. The study was carried out between April 2021 and June 2023. The COSMIN recommendations were used to determine the sample size and to have a minimum of 5 times ($5 \times 34 = 170$) the total number of questions in the scale used for construct validity.^{16 17} For the test–retest reliability of the study, the sample size estimate at 95% CI, the ICC 0.81 and the CI of 0.1 were

used. The study included the parents or caregivers of a total of 204 physically disabled children aged 2–12 years who received physiotherapy at the Special Education and Rehabilitation Centre in Antalya and who had a physical disability report. The study inclusion criteria were as follows: (a) voluntary participation in the study, (b) having a health report from a fully equipped hospital stating that the individual has a physical disability, (c) the evaluated child in the age range of 2–12 years and (d) the respondent (caregiver or parent) to be Turkish literate. A total of 22 subjects were excluded as they did not wish to participate in the study or did not fully complete the questionnaires. Test–retest was applied to 74 of the total 182 respondents at a 2-week interval to determine reliability. The demographic information of the children, including diagnosis, age, height, weight, education level, dominant hand and use of assistive devices was recorded. The scales were completed by the mother or father. The average age of mothers was 34.26 ± 13.28 years, while the average age of fathers was 38.67 ± 10.98 years in total. The respondent was a mother with a rate of 88.97% and a father with a rate of 11.03%. At the end of the study, the children's families were informed about the children's participation.

Measurements

The Children's Assessment of Participation with Hands

The CAP-H scale was used to evaluate children's hand participation and to examine the validity and reliability of the Turkish version. The original scale was developed by Chien *et al* in Australia⁹ to evaluate the difficulties experienced by children aged 2–12 years in using the hands in daily living activities that require hand participation. It is a parent report questionnaire so the scale can be completed by mother, father or caregiver. The scale consists of 32 items in 4 sections: self-care participation (9 items), recreation participation (11 items), educational participation (8 items), and domestic life and community participation (9 items). Each section has four subscores of participation, frequency of participation, level of assistance and desire for change sections, scored with Likert-type responses, and higher scores indicate higher hand participation. The percentage score is obtained by dividing the total score by the number of items marked in the subscores of difference and change request. In frequency and level of assistance scoring, the score is obtained by dividing the total score by the number of items marked. For each item, the highest score obtained can be 1 in participation, 5 in frequency of participation, 4 in level of assistance and 1 in desire for change.¹⁰

Statistical analysis

Data obtained in the study were analysed statistically using SPSS V.25.0 software. The compatibility of the variables to normal distribution was examined using the Kolmogorov-Smirnov and Shapiro-Wilk tests. Data were stated as mean \pm SD values, or number (n) and percentage (%). Test and retest reliability was tested with a two-way

random-effect ICC and was shown at a 95% CI. The ICC was interpreted as perfectly reliable ≥ 0.80 , moderately reliable $= 0.60$ – 0.79 , low confidence < 0.60 .¹⁸ The Cronbach's α coefficient was used for internal consistency as follows: excellent (> 0.80), adequate (0.70 – 0.79) and inadequate (< 0.70).¹⁹ A Cronbach's α coefficient ≥ 0.7 was acceptable. As the data for comparing children did not conform to normal distribution, it was tested using Mann-Whitney U test. A $p < 0.05$ was determined as the level of statistical significance.

RESULTS

Evaluation was made of a total of 182 children with physical disabilities, comprising 101 boys and 81 girls, with a mean age of 8.53 ± 3.94 years and 90 typically developing children with a mean age of 9.40 ± 3.04 . The variables of the diagnosis, body mass index and education level of the children are shown in table 1.

Reliability

Internal consistency

Cronbach's α was used for all the CAP-H items for all dimensions. The results of these values are shown in table 2. Accordingly, for participation, the Cronbach's α values were found to be perfect (Cronbach's $\alpha = 1$) in all dimensions. For the frequency of participants, the Cronbach's α values were between 0.84 – 0.90 , for level of assistance, 0.89 – 0.92 and for desire for change, 0.91 – 0.94 . The Cronbach's α values for frequency of participant, level of assistance and desire for change were found to be excellent (table 2).

Test–retest reliability

The ICC values at 95% CI for the 4 subscores of all sections of CAP-H are shown in table 2. When the test–retest values of the items were analysed separately, the ICC value for the frequency of participant subscore was found to be good/excellent (ICC: 0.57 – 1), for the level of assistance subscore, excellent (ICC: 0.91 – 0.99) and for the desire for change subscore, excellent (ICC: 0.79 – 1). When the test–retest reliability was examined over the total score, participation (ICC: 0.99 – 1), frequency of participation (ICC: 0.92 – 0.99), level of assistance (ICC: 0.99 – 1.00) and desire for change (ICC: 0.81 – 0.99) were found to be perfect in all areas (table 2).

Comparison of children

Participant

There was a significant difference found in all domains of participation (recreation, educational and domestic life) in favour of typically developing children (Z : -9.72 to -1.12 , $p < 0.001$); except of self-care participation ($p > 0.05$, table 3).

Frequency of participation

There was a significant difference found in self-care and domestic life domain of frequency of participation in favour of typically developing children (Z : -4.83 to -1.54 ,

Table 1 Demographics and health-related variables of children

Variable	Mean±SD		Median (Min-max)	
	Children with PD	Typically developed children	Children with PD	Typically developed children
Age	8.53±3.94	9.40±3.04	7 (4-12)	7 (4-12)
Body mass index	22±9.51	23.02±10.12	19.2 (14.8–28.3)	20.2 (15.03–28.06)
Education level (year)	3.54±3.87	4.02±3.77	3 (0–8)	5 (1–8)
	n		%	
Dominant hand right	149		81.9	
left	33		18.1	
Diagnosis				
Cerebral palsy	99		54.4	
Developmental delay	37		20.3	
Down syndrome	22		12.0	
Muscular dystrophy	6		3.3	
Spina bifida	8		4.4	
Brachial plexus	6		3.3	
Mitochondrial myopathy	2		1.1	
Duchenne muscular dystrophy	2		1.1	
Using assstitive devices				
DAFO	22		12.08	
AFO	17		9.4	
Walker	14		7.7	
Long walking devices	2		1.1	
Night foot mould	6		3.3	
Wheelchair	41		22.5	

AFO, ankle foot orthosis; DAFO, dynamic ankle foot orthosis; max, maksimum; min, minimum; PD, physical disabilities.

$p=0.00$). There was not any significant difference in the recreation and educational domain ($p>0.05$, [table 3](#)).

Level of assistance (independence)

There was a significant difference found in all domains of independence in favour of

typically developing children (Z : -4.19 to -8.44 , $p<0.001$, [table 3](#)).

Desire for change

There was a significant difference found in all domains of desire for change in favour of children with physical disabilities (Z : -4.19 to -8.44 , $p<0.001$, [table 3](#)).

DISCUSSION

The results of this study demonstrated that the Turkish version of CAP-H, which is the only scale evaluating hand participation, is a reliable scale in the areas of self-care, recreational, educational, domestic life and community participation of children with a physical disability, aged 4–12 years. In addition, it was found that hand participation of children with physical disabilities was lower than

typically developing children of the same age. This is the first study to have adapted the original English version of the scale to a different language with cultural adaptation and reliability studies. This scale is based on parental reporting adapted to Turkish culture and has the distinction of being the only specific scale for the assessment of hand-use in life participation in Turkey.

In the original study, 82.5% of the respondents were mothers, while 11.3% were fathers. These results are consistent with the results of the study. However, the age range of the respondents was quite higher than the average age in our study. This result may be due to the earlier age of having children in our country.

In this study, the Cronbach's alpha values used for participation diversity scoring in self-care, recreational, educational and domestic life and community participation domains were found to be almost perfect in all items (Cronbach's α : 0.84–1) for internal consistency. While there was 100% compliance for all other items, item 6 of the self-care participation section, 'put on clothes at home after a shower/bath or when getting dressed' was found to be 92.86%. This finding was thought to be

Table 2 Internal consistency and test–retest reliability of Children’s Assessment of Participation with hands domains

Domain	Test	Retest	Difference	Cronbach’s α	%95 CI	ICC
Self-care						
Participation	77.11±32.11	76.33±31.77	0.78±2.88	1	0.997 to 0.999	0.998
Frequency	3.59±1.54	3.57±1.53	0.02±0.08	0.9	0.999 to 0.999	0.999
Level of assistance	1.64±1.14	1.60±1.12	0.04±0.13	0.91	0.994 to 0.998	0.997
Desire for change	60.37±45.12	75.75±37.52	15.38±25.40	0.93	0.871 to 0.970	0.938
Recreational						
Participation	60.66±33.11	60.66±33.11	0±0	1	1–1	1
Frequency	2.38±1.34	2.38±1.34	0±0.05	0.85	0.999 to 1	1
Level of assistance	1.51±1.18	1.51±1.18	0±0.04	0.91	0.999 to 1	1
Desire for change	59.95±31.81	60.63±33.12	0.68±1.31	0.91	0.412 to 0.955	0.818
Educational						
Participation	52.50±39.25	52.50±39.25	0±0	1	1 to 1	1
Frequency	2.24±1.73	2.24±1.72	0±0.08	0.9	0.999 to 1	0.999
Level of assistance	1.29±1.31	1.29±1.30	0±0.05	0.92	0.999 to 1	1
Desire for change	51.89±42.51	61.53±40.65	9.64±28.67	0.94	0.977 to 0.998	0.993
Domestic life and community						
Participation	51.25±39.25	51.25±39.25	0±0	1	1 to 1	1
Frequency	1.98±1.35	1.92±1.32	0.06±0.19	0.84	0.992 to 0.997	0.995
Level of assistance	1.27±1.17	1.27±1.16	0±0.04	0.89	0.999 to 1	1
Desire for change	63.28±36.64	71.87±37.05	7.59±27.89	0.91	0.867 to 0.996	0.979

ICC, intraclass correlation coefficient.

culturally related to helping a child to dress, especially by the families when the child is disabled. Cronbach’s alpha value used for frequency of participant, level of assistance and desire for change subscores was found to be excellent in all domains of participation for internal consistency (Cronbach’s α : 0.97–0.84). According to the test–retest reliability results, it was found to be perfectly reliable in all four domains (ICC: 0.81–1). In the study, in which the original scale was developed, all subscores were perfectly reliable only in the domain of self-care participation, and there was moderate, perfect reliability even at low confidence in the other three domains. The test–retest values in the domain of self-care participation of the current study are consistent with the results of the original study in this domain. It was found that especially the recreational participation domain had low confidence reliability in scoring of desire for change, and moderate reliability in participation diversity, frequency and level of assistance subscore in the original study. They stated that this poor test–retest reliability in the desire for change may have led to variable responses in terms of this subscore over time, as parents may not be sure about their children’s participation in certain recreational activities due to their child’s disability.⁹ In the current study, it was observed that the levels of participation were consistent, but the percentage of desire for change was quite low compared with the previous

study. Familial factors such as ‘the impact of the child’s disability on family finances and time’, ‘family demographics’, ‘a supportive home environment’ and ‘family’s recreational preferences’ have a great influence on recreational activity participation.^{19 20} Failure of the family to participate actively in daily living will adversely affect the child’s recreational participation, and therefore, parents may not have attached enough importance to the recreational participation domain when answering the scale items.

When comparing the children’s hand participation in the current study to those of children with physical disabilities, typically developing children performed better overall in the domains of self-care, recreational, educational and domestic and community life, as well as in terms of participation frequency, independence and desire for change. In the self-care domain, only in terms of participation, the children were similar to each other. This result showed that children with disabilities participate in self-care activities, but they do it less frequently and need more help than typically developing children. It was stated that families of children with physical disabilities also desire a change in their participation in this domain. In the recreational and educational participation domain, only in terms of frequency the children were similar. Accordingly, children with physical disabilities participating in recreational and educational

Table 3 Comparison CAP-H between children with physical disabilities and typically developed children

	X±SD			
Domain with dimension	Children with PD	Typically developed children	Z	P value*
Self-care				
Participation	77.11±32.11	91.60±9.90	−1.12	0.25
Frequency	3.59±1.54	5.11±1.50	−4.83	0
Independence	1.64±1.14	3.75±0.39	−8.44	0
Desire for change	60.37±45.12	16.28±27.13	−6.57	0
Recreational				
Participation	60.66±33.11	83.92±15.01	−4.78	0
Frequency	2.38±1.34	3.75±0.86	−1.42	0.15
Independence	1.51±1.18	3.89±0.28	−6.36	0
Desire for change	59.95±31.81	41.32±34.44	−5.94	0
Educational				
Participation	52.50±39.25	92.31±16.66	−8.97	0
Frequency	2.24±1.73	4.34±0.75	−0.51	0.6
Independence	1.29±1.31	3.75±0.67	−6.09	0
Desire for change	51.89±42.51	27.57±31.22	−2.7	0
Domestic life and community				
Participation	51.25±39.25	89.82±11.81	−9.72	0
Frequency	1.98±1.35	3.86±0.49	−1.54	0
Independence	1.27±1.17	3.77±0.41	−4.19	0
Desire for change	63.28±36.64	30.80±27.71	−3.25	0
*Mann-Whitney U test.				
CAP-H, Children's Assessment of Participation with Hands; PD, physical disabilities; X, mean.				

*Mann-Whitney U test.

CAP-H, Children's Assessment of Participation with Hands; PD, physical disabilities; X, mean.

activities use their hands as often as typically developing children. However, these children needed more help in this area, and their families also desired more change. In the domestic and community life domain, children with physical disabilities had less hand participation, used their hands less frequently and needed more help than typically developing children. In addition, their families also desired more change in this domain. Our results are in line with the results that children with disabilities are at lower risk of participating in usual activities at home and in the community.²¹ As in many countries, children's participation in recreational activities is low in Turkey,²² and according to the current study, hand participation in these activities is also lower than typically developing children.

The strength of this study is that there is no other scale that measures children's hand use in life participation, reliability in Turkish, and it is the first different language adaptation, with reliability studies other than the original version of this scale. However, there were also some limitations to the study, primarily that only children with physical disabilities were included. Unlike the original study, diagnoses such as cerebral palsy or Down's syndrome were included in the physical disability classification in this study, because in Turkey, physiotherapists generally work one-to-one with children with a physical disability

health report from health institutes. One of the limitations was the heterogeneity of the population that constituted the research sample; this could be an important factor affecting reliability. Another limitation was that the sample size was relatively small because only children with physical disabilities were included, although the minimum number of participants was 5–10 times the number of questions in the validity and reliability studies as proposed in the reference study. The final limitation was that the children were all recruited from a single centre in one city. It can be recommended that future studies investigate the discriminant validity of this scale by comparing typically developing children with children with disabilities.

CONCLUSIONS

The results of this study demonstrated that the Turkish translation of CAP-H is a reliable evaluation for children's participation in life requiring hand use. Therefore, physiotherapists, occupational therapists or clinicians can safely use the Turkish version of CAP-H in special education and rehabilitation centres or clinics to evaluate children with physical disabilities aged 4–12 years with respect to participation in life with hand use. Furthermore, it was seen that hand participation of physically handicapped

children was lower than typically developing children. According to these results, rehabilitation can be planned to increase hand participation of children with physical disabilities at home, school and in the environment.

Acknowledgements We would like to thank all of participants for participating in the study and PT, Osteopath Sibel Öztürk and PT, Nükhet Sevyurt Bağlan who enabled us to meet the parents of children in Special Education and Rehabilitation Centre. Also, we would like to thank Will Chien to help in the methods section and comments.

Contributors SYC was the guarantor. SYC, HAT, HS, OKK and KK contributed to the development of the study methodology. SYC, HAT and OKK contributed data collection and analysis. SYC and OKK participated in writing and reviewing. HS and OKK edited the manuscript and approved the final version.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests No, there are no competing interests.

Patient and public involvement Patients and/or the public were involved in the design, or conduct, or reporting, or dissemination plans of this research. Refer to the Methods section for further details.

Patient consent for publication Consent obtained directly from patient(s).

Ethics approval This study involves human participants and was approved by the Akdeniz University Interventional Clinical Research Ethics Committee (Approval ID: 2019-192). Participants gave informed consent before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data sharing not applicable as no datasets generated and/or analysed for this study.

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REFERENCES

- 1 World Health Organization. *International classification of functioning, disability and health*. Geneva: World Health Organization, 2001.
- 2 World Health Organization. *International classification of functioning, disability and health: version of children and youth*. Geneva: World Health Organization, 2007.
- 3 Klaas SJ, Kelly EH, Gorzkowski J, *et al*. Assessing patterns of participation and enjoyment in children with spinal cord injury. *Develop Med Child Neuro* 2010;52:468–74.
- 4 Hilton CL, Crouch MC, Israel H. Out-of-school participation patterns in children with high-functioning autism spectrum disorders. *Am J Occup Ther* 2008;62:554–63.
- 5 Sköld A. *Performing bimanual activities in everyday life – experiences of children with unilateral cerebral palsy*. Stockholm, Sweden: Department of Woman and Child Health Karolinska Institute, 2010.
- 6 Leconte P, Fagard J. Which factors affect hand selection in children's grasping in hemiparesis? Combined effects of task demand and motor dominance. *Brain Cogn* 2006;60:88–93.
- 7 Chien C-W, Brown T, McDonald R, *et al*. The contributing role of real-life hand skill performance in self-care function of children with and without disabilities. *Child Care Health Dev* 2014;40:134–44.
- 8 Pavão SL, Pessarelli Visicato L, da Costa CSN, *et al*. Effect of the severity of manual impairment and hand dominance on anticipatory and compensatory postural adjustments during manual reaching in children with cerebral palsy. *Res Dev Disabil* 2018;83:47–56.
- 9 Chien CW, Rodger S, Copley J. Development and Psychometric Evaluation of a New Measure for Children's Participation in Hand-Use Life Situations. *Arch Phys Med Rehabil* 2015;96:1045–55.
- 10 Chien C, Rodger S, Copley J, *et al*. Measures of participation outcomes related to hand use for 2- to 12-year-old children with disabilities: a systematic review. *Child Care Health Dev* 2014;40:458–71.
- 11 Kaya Kara O, Turker D, Kara K, *et al*. Psychometric properties of the Turkish version of Participation and Environment Measure for Children and Youth. *Child Care Health Dev* 2020;46:711–22.
- 12 Bedell G. Further validation of the Child and Adolescent Scale of Participation (CASP). *Dev Neurorehabil* 2009;12:342–51.
- 13 Coster W, Law M, Bedell G, *et al*. Development of the participation and environment measure for children and youth: conceptual basis. *Disabil Rehabil* 2012;34:238–46.
- 14 Schellings G, Van Hout-Wolters B. Measuring strategy use with self-report instruments: theoretical and empirical considerations. *Metacognition Learn* 2011;6:83–90.
- 15 Sousa VD, Rojjanasirath W. Translation, adaptation and validation of instruments or scales for use in cross-cultural health care research: a clear and user-friendly guideline. *J Eval Clin Pract* 2011;17:268–74.
- 16 Mokkink LB, Terwee CB, Patrick DL, *et al*. The COSMIN checklist for assessing the methodological quality of studies on measurement properties of health status measurement instruments: an international Delphi study. *Qual Life Res* 2010;19:539–49.
- 17 Mokkink LB, Terwee CB, Patrick DL, *et al*. The COSMIN study reached international consensus on taxonomy, terminology, and definitions of measurement properties for health-related patient-reported outcomes. *J Clin Epidemiol* 2010;63:737–45.
- 18 Bonett DG. Sample size requirements for estimating intraclass correlations with desired precision. *Stat Med* 2002;21:1331–5.
- 19 Andresen EM, Fitch CA, McLendon PM, *et al*. Reliability and validity of disability questions for US Census 2000. *Am J Public Health* 2000;90:1297–9.
- 20 Murphy NA, Carbone PS, and the Council on Children With Disabilities. Promoting the Participation of Children With Disabilities in Sports, Recreation, and Physical Activities. *Pediatrics* 2008;121:1057–61.
- 21 King G, Lawm M, King S, *et al*. A Conceptual Model of the Factors Affecting the Recreation and Leisure Participation of Children with Disabilities. *Phys & Occupational Therapy In Pediatrics* 2003;23:63–90.
- 22 Steinhart F, Ullenhag A, Jahnsen R, *et al*. Perceived facilitators and barriers for participation in leisure activities in children with disabilities: Perspectives of children, parents and professionals. *Scand J Occup Ther* 2021;28:121–35.