

# Functional independence measure (WeeFIM) reference values in Indian children aged 3–7 years: A cross-sectional study

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## ABSTRACT

**Background.** We sought to establish reference values of the functional independence measure (WeeFIM; Unified Data System for Medical Rehabilitation, Buffalo, NY, USA) for children aged 3–7 years in India using this cross-sectional study.

**Methods.** We obtained permission from the Unified Data System for Medical Rehabilitation, a non-profit organization to use the WeeFIM instrument. Participants were recruited randomly from schools. After obtaining written informed consent, direct interviews for WeeFIM II Clinical Guide (version 6.0) were conducted for parent/guardian/teacher of 182 typically developing children.

**Results.** There was a progressive increase of functional independence with increasing chronological age across all WeeFIM domains. Total score of the WeeFIM instrument showed a similar performance between boys and girls. At the beginning of 3 years, children were at WeeFIM level 3 that is moderate assistance stage in their functional independence, but by the age of 7 years, they became completely independent on all the three domains of WeeFIM functional scale.

**Conclusions.** We have provided reference values for WeeFIM in children of India aged 3–7 years (35–84 months). There were no differences between boys and girls regarding WeeFIM performance. Children in private schools showed better performance versus children in government schools in the early age ranges. We could not find any effect of socioeconomic status on WeeFIM raw rating or functional independence level.

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## INTRODUCTION

During comprehensive evaluation of a child, it is essential to assess function, as it will determine what a child can achieve in a particular environment. McCabe and Granger described the

functional assessment of children as an attempt to systematically describe and quantify a child's capabilities and restrictions while performing activities of daily living.<sup>1</sup> Functional assessment has many advantages. It can evaluate the environmental needs and circumstances to complete the activity in an educational or community set up.<sup>1,2</sup>

There are four well-accepted and widely used functional outcome measures available: the Pediatric Evaluation of Disability Inventory, Vineland Adaptive Behavior Scale, Battelle Developmental Inventory Screening Test and Functional Independence Measure for children (WeeFIM; Unified Data System for Medical Rehabilitation, Buffalo, NY, USA).<sup>1–6</sup> However, though the former three instruments have discriminative measures, they are time-consuming to administer and their scoring does not have the ability to track the performance of an individual over a period of time.<sup>2,3</sup>

The WeeFIM scale consists of 18 items. Each item is evaluated on a 7-point ordinal scale and assesses a child's performance in day-to-day functional tasks. There are three main domains: self-care, mobility and cognition. Each domain has some test items which were assessed by observations or by interview. WeeFIM is usually applied in typically developing children of 6 months to 7 years of age. However, the scale can be used up to 21 years for children with developmental disabilities.<sup>7–15</sup> WeeFIM has various advantages that include a clear scoring system, consistency in application, being comprehensive, and administration by multidisciplinary health professionals.<sup>3,7,8</sup>

Normative WeeFIM data have been validated previously for American, Chinese, Japanese and Turkish children. Prior studies have identified ethnic, cultural and environmental differences in different countries and these influence the pattern of independence.<sup>3,7,16</sup> In the assessment of functional performance, some investigators emphasize the importance of context. Contextual issues deal with the influence of environmental and social issues on a child's functions.<sup>17,18</sup>

Research by Schneider *et al.* concluded that children from different cultures develop at different rates; therefore, applying a set of norms from one culture to another culture could misrepresent a child's true developmental status.<sup>19</sup> Due to such cultural and environmental differences among countries and the dearth of WeeFIM application in India, there is a need for reference values for Indian children. With reference values, the progression of independence at home and in the community can be evaluated.

There are no known studies of reference values of Indian children aged 3–7 years. We aimed to establish reference values of WeeFIM data for Indian (Mangalore) children aged 3–7 years

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and to elucidate the difference in WeeFIM domain rating between the sexes, identify differences among children in government versus private schools and determine the effects of the socioeconomic status on the WeeFIM rating.

## METHODS

In this cross-sectional study, schoolchildren of both sexes aged 3–7 years were selected using stratified cluster random sampling from pre-schools and primary schools of Mangalore, India. Children were divided into subgroups of 3-month age intervals (e.g. 35–37 months, 38–40 months). The duration of the study was 1 year. This study included typically developing Indian children of both sexes in the age range of 3–7 years and excluded children with any neuromuscular or musculoskeletal abnormalities or other medical conditions that might affect their physical performance as well as children with any medical illness present in the past 1 month. The exclusion of medical conditions was based only on history and examination.

This study was approved by the relevant scientific research committee and the institutional ethics committee. The list of schools (government and private) and names of the children enrolled in each school were obtained from the block education office, whereas the list of *Anganwadi* (government pre-schools) and the names of children enrolled in them were obtained from the Child Development Programme Office. Stratified cluster sampling was performed for the selection of children aged 3–7 years from the schools and pre-schools.

Permission was obtained from the Unified Data System for Medical Rehabilitation, a non-profit organization to use the WeeFIM instrument. The WeeFIM II Clinical Guide (version 6.0) was obtained from this organization. The study aimed to explain the parent/guardian/teacher of each child, and a written consent form was signed by them. The demographic details about each parent and child were noted, and screening was done for adherence to inclusion and exclusion criteria. Parent's education, occupation and social status were obtained using the Kuppaswamy socioeconomic status scale (2019).<sup>20</sup> One of the child physical therapists, who underwent training on the WeeFIM scale and passed the necessary examination to administer WeeFIM from Uniform Data System for Medical Rehabilitation administered WeeFIM for all the children. The WeeFIM evaluation was administered by directly interviewing the parent/guardian/teacher about the child's performance of tasks. The interview process took 15–20 minutes. The therapist was fluent in English and Kannada. Hence, the interview was conducted based on the parents/guardians/teacher's convenience in any of the above-mentioned languages. For majority of the parents, the interview language was English.

As previously stated, the WeeFIM instrument is an 18-item, 7-level ordinal scale used to assess a child's typical performance in three subdomains: self-care, mobility and cognition. A maximum rating of 7 points on this scale represents complete independence, whereas a minimal rating of 1 point represents total assistance. Data were collected according to the WeeFIM II guidelines (version 6.0).

## Data analysis

The Statistical Package for the Social Sciences version 20.0 (IBM Corp., Armonk, NY, USA) was used to analyse the collected data. The level of statistical significance was set at <0.05% with a 95% confidence interval. Descriptive statistics

were used to obtain mean and standard deviation (SD) values for each domain rating (raw rating), gender-based rating (raw rating), school-based rating (raw rating) and rating based on socioeconomic class (raw rating). An independent *t*-test was used to compare the studied group and WeeFIM score, to compare between boys and girls, and in school (government and private)-based comparisons. Analysis of variance was used to determine the influence of socioeconomic class on the achievement of each domain rating (raw rating).

## RESULTS

One hundred and eighty-two children (87 boys [48%] and 95 girls [52%]) participated in this study. Their mean (SD) age was 59.3 (14.2) months. The other demographic data are given in Table I.

The descriptive statistics were used to obtain mean (SD) values of the WeeFIM total scores and all three subdomains (self-care, mobility and cognition) for each age group. Table II gives the mean and SD values of WeeFIM total and all three subdomains of the studied sample. The WeeFIM total score between sexes and between children in government versus private schools for each age group are presented in Tables III and IV.

Table III shows the means and SD of the WeeFIM total scores in each sex, with independent *t*-test results and significance levels for all age groups. Table III shows that there were no significant differences between the sexes.

Table IV includes the mean and SD values of the WeeFIM total scores for government and private schools, with independent *t*-test results and significance levels for all age groups. Table IV shows that there were significant differences in the performance of children in government and private schools in the early age ranges (<60 months). In the early age ranges, the children in private schools performed better than did the children in government schools. However, in later age ranges (>61 months), there were no significant differences in the performance of children in government versus private schools.

Age-wise comparisons of mean values for the WeeFIM total scores and all three subdomains (self-care, mobility and cognition) are shown in Fig. 1. It shows progressive increases in the WeeFIM total score and all three subdomains throughout all age ranges. Analysis of variance was used to identify the effects of socioeconomic status on WeeFIM total score in each age range (Table V). The findings indicate that there was no significant effect of socioeconomic class on WeeFIM ratings.

TABLE I. Demographic details of children ( $n=182$ ) included in this study

Item	<i>n</i>
<i>Sex</i>	
Boys	87
Girls	95
<i>School types</i>	
Government	61
Private	121
<i>Socioeconomic status</i>	
Upper class	7
Upper middle class	50
Lower middle class	57
Upper lower class	68

TABLE II. Wee functional independence measure (FIM) scale total scores and rating of the three domains

Age range (months)	Number of children	Self-care domain raw rating (56)		Mobility domain raw rating (35)		Cognition domain raw rating (35)		Total item raw rating (126)				
		Mean (SD)	% of 56	WeeFIM levels (1-7)	Mean (SD)	% of 35	WeeFIM levels (1-7)	Mean (SD)	% of 126	WeeFIM levels (1-7)		
35-37	11	33.6 (1.6)	60.0	31.4 (1.1)	89.7	4 (75%-90%)	23.1 (0.8)	66.0	3 (50%-74%)	88.2 (3.0)	70.0	3 (50%-74%)
38-40	13	36.8 (1.6)	65.7	32.6 (0.6)	93.2	Minimal assistance	24.0 (0.2)	68.5	Moderate assistance	93.6 (2.0)	74.2	Moderate assistance
41-43	10	39.0 (2.2)	69.6	33.2 (0.6)	94.8	5 (≥75%)	24.5 (0.5)	70.0	3 (50%-74%)	96.6 (2.2)	76.6	4 (≥75%)
44-46	8	40.0 (2.1)	71.0	33.3 (0.5)	95.1	Supervision	25.6 (1.0)	73.1	4 (75-90%)	99.0 (1.8)	78.5	4 (≥75%)
47-49	9	41.2 (2.7)	73.5	33.4 (0.5)	95.4	6 (≥75%)	26.7 (0.6)	76.2	Minimal assistance	101.2 (2.7)	80.3	Minimal assistance
50-52	13	44.0 (0.5)	78.5	33.7 (0.4)	96.2	Modified independence	28.0 (0.4)	80.0	5 (>90%)	106.0 (1.0)	84.1	5 (≥75%)
53-55	14	46.1 (1.5)	82.3	34.2 (0.4)	97.7	or 7 (≥75%)	29.1 (1.0)	83.1	Supervision	109.5 (2.7)	86.9	6 (≥75%)
56-58	8	47.6 (0.9)	85.0	34.2 (0.7)	97.7	Complete independence	30.7 (1.2)	87.7	6 (>90%)	112.7 (2.8)	89.4	6 (≥75%)
59-61	11	48.6 (0.5)	86.7	34.1 (0.4)	97.4	or 7 (≥75%)	31.6 (0.5)	90.2	Supervision	114.4 (0.6)	90.7	Supervision
62-64	13	49.5 (0.5)	88.3	34.1 (0.3)	97.4	Complete independence	32.0 (0.4)	91.4	6 (≥75%)	115.6 (0.7)	91.7	6 (≥75%)
65-67	14	51.0 (0.3)	91.0	34.3 (0.5)	98.0	Modified independence	32.5 (0.5)	92.8	6 (>90%)	117.9 (0.8)	93.5	Modified independence
68-70	10	52.5 (0.5)	93.7	34.6 (0.5)	98.8	or 7 (≥75%)	32.9 (0.3)	94.0	Complete independence	120.0 (0.8)	95.2	Complete independence
71-73	7	52.7 (0.4)	94.1	34.4 (0.5)	98.2	or 7 (≥75%)	33.0 (0.0)	94.2	Complete independence	120.2 (1.1)	95.3	Complete independence
74-76	13	53.3 (0.6)	95.1	34.3 (0.5)	98.0	Complete independence	33.2 (0.4)	94.8	Complete independence	121.0 (1.0)	96.0	Complete independence
77-79	12	53.5 (0.5)	95.5	34.6 (0.4)	98.8	or 7 (≥75%)	33.0 (0.2)	94.2	Complete independence	121.5 (0.9)	96.4	Complete independence
80-82	11	54.6 (0.5)	97.5	34.9 (0.3)	99.7	Complete independence	33.7 (0.4)	96.2	Complete independence	123.2 (1.0)	97.7	Complete independence
>83	5	55.8 (0.4)	99.6	35.0 (0.0)	100.0	Complete independence	34.4 (0.5)	98.2	Complete independence	125.2 (0.8)	99.6	Complete independence

Scale name	Domain	Number of items	Minimum to maximum score per item	Minimum score	Maximum score	WeeFIM scores	Interpretation
WeeFIM	Self-care	8	1-7	8	56	1	Total assistance
	Mobility	5	1-7	5	35	2	Maximal assistance
	Cognition	5	1-7	5	35	3	Moderate assistance
	Total	18	1-7	18	126	4	Minimal assistance
						5	Supervision
						6	Modified independence
						7	Complete independence

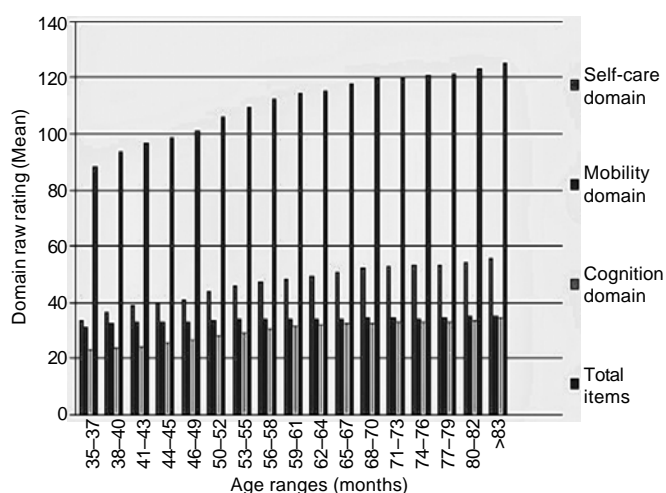


FIG 1. WeeFIM scale total scores and rating of all three domains

## DISCUSSION

Studies on WeeFIM instrument use have emphasized the consideration of age, sociocultural and familial economic status, and environmental factors in the evaluation of functional independence in children.<sup>3,7,19</sup>

We found that the independence levels of children increased with advancing age in all domains. This progression was predominately present in early ages compared with the later ages and mainly in two domains (self-care and cognition). In the self-care domain, until 49 months and in the cognition domain until 46 months, children required moderate assistance (level 3). Thereafter, in these two domains, children were able to complete activities requiring minimal assistance (level 4); this means that they attained 75% or more independence for the functional activities, which finally turns into complete independence in even later age ranges.

For the self-care domain, children needed moderate assistance until 48 months of age, as many activities under this domain are

TABLE III. Wee functional independence measure (FIM) total item rating in girls and boys

Age range (months)	Boys				Girls				p value
	n	Mean (SD)	Percentage	WeeFIM level (1-7)	n	Mean (SD)	Percentage	WeeFIM level (1-7)	
35-37	5	87.0 (2.3)	69.0	3 (50%-74%)	6	89.3 (3.3)	70.8	3 (50%-74%)	0.22
38-40	4	94.0 (1.1)	74.6	Moderate assistance	9	93.4 (2.4)	74.1	Moderate assistance	0.67
41-43	6	95.8 (2.4)	76.0	4 ( $\geq 75\%$ )	4	97.7 (1.5)	77.5	4 ( $\geq 75\%$ )	0.20
44-46	3	100.6 (1.5)	79.8	Minimal assistance	5	98.0 (1.2)	77.7	Minimal assistance	0.03
47-49	4	99.7 (2.2)	79.1	5 ( $\geq 75\%$ )	5	102.4 (2.7)	81.2	5 ( $\geq 75\%$ )	0.15
50-52	8	105.7 (1.0)	83.8	Supervision	5	106.4 (0.8)	84.4	Supervision	0.27
53-55	7	109.2 (2.9)	86.6	6 ( $\geq 75\%$ )	7	109.7 (2.8)	87.0	6 ( $\geq 75\%$ )	0.78
56-58	6	114.1 (1.3)	90.5	Modified independence	2	108.5 (0.7)	86.1	Modified independence	0.001
59-61	5	114.8 (0.8)	91.1	or	6	114.6 (0.4)	90.9	or	0.13
62-64	4	115.7 (0.5)	91.8	7 ( $\geq 75\%$ )	9	115.6 (0.8)	91.7	7 ( $\geq 75\%$ )	0.86
65-67	7	118.0 (1.0)	93.6	Complete independence	7	117.8 (0.6)	93.4	Complete independence	0.76
68-70	6	119.6 (0.8)	94.9		4	120.5 (0.5)	95.6		0.11
71-73	2	121.0 (1.4)	96.0		5	120.0 (1.0)	95.2		0.32
74-76	8	121.3 (0.7)	96.2		5	120.6 (1.3)	95.7		0.20
77-79	7	121.2 (1.1)	96.1		5	122.0 (0.0)	96.8		0.18
80-82	4	122.7 (1.2)	97.3		7	123.5 (0.7)	98.0		0.21

TABLE IV. Wee functional independence measure (FIM) total item rating in children from government and private schools

Age range (months)	Government				Private				p value
	n	Mean (SD)	Percentage	WeeFIM level (1-7)	n	Mean (SD)	Percentage	WeeFIM level (1-7)	
35-37	5	86.4 (2.0)	68.5	3 (50%-74%)	6	89.8 (2.9)	71.2	3 (50%-74%)	0.05
38-40	3	91.0 (1.0)	72.2	Moderate assistance	10	94.4 (1.5)	74.9	Moderate assistance	0.001
41-43	2	93.0 (0.0)	73.8		8	97.5 (1.4)	77.3	4 ( $\geq 75\%$ )	0.001
44-46	3	97.3 (1.1)	77.2	4 ( $\geq 75\%$ )	5	100.0 (1.4)	79.3	Minimal assistance	0.03
47-49	4	99.5 (3.1)	78.9	Minimal assistance	5	102.6 (1.5)	81.4	5 ( $\geq 75\%$ )	0.08
50-52	5	105.6 (1.3)	83.8	5 ( $\geq 75\%$ )	8	106.2 (0.7)	84.2	Supervision	0.27
53-55	5	107.0 (0.7)	84.9	Supervision	9	110.8 (2.5)	87.9	6 ( $\geq 75\%$ )	0.001
56-58	3	109.6 (2.0)	86.9	6 ( $\geq 75\%$ )	5	114.6 (0.8)	90.9	Modified independence	0.001
59-61	3	114.0 (0.0)	90.4	Modified independence	8	114.6 (0.7)	90.9	or	0.19
62-64	5	116.0 (0.7)	92.0	or	8	115.5 (0.7)	91.6	7 ( $\geq 75\%$ )	0.26
65-67	4	117.5 (0.5)	93.2	7 ( $\geq 75\%$ )	10	118.1 (0.8)	93.7	Complete independence	0.23
68-70	3	119.6 (0.5)	94.9	Complete independence	7	120.1 (0.8)	95.3		0.43
71-73	2	120.5 (0.7)	95.6		5	120.2 (1.3)	95.3		0.77
74-76	3	120.3 (0.5)	95.4		10	121.3 (1.0)	96.2		0.16
77-79	4	122.0 (0.8)	96.8		8	121.3 (0.9)	96.2		0.27
80-82	5	123.8 (0.4)	98.2		6	122.8 (1.1)	97.4		0.11
>83	2	125.5 (0.7)	99.6		3	125.0 (1.0)	99.2		0.59

TABLE V. Comparison based on socioeconomic status

Age range (months)	Number of children (n)	Socioeconomic class (Kuppuswamy scale, 2019)	Total item raw rating (studied sample), mean (SD)	p value
35–55	6	Upper class	93.8 (3.9)	0.1
	26	Upper middle class	99.9 (6.8)	
	19	Lower middle class	98.7 (8.3)	
56–67	27	Upper lower class	101.1 (7.5)	0.5
	15	Upper middle class	115.8 (2.5)	
	19	Lower middle class	115.1 (2.4)	
67–84	12	Upper lower class	115.9 (1.7)	0.1
	1	Upper class	119.0 (0.0)	
	9	Upper middle class	121.1 (0.7)	
	19	Lower middle class	121.4 (1.7)	
	29	Upper lower class	122.0 (1.9)	

supported by parents or caregivers. As such, children would still be dependent even though they might be able to execute certain required skills. This is possible because many parents in our society have the perception that their child needs help with tasks such as eating, grooming, bathing and toileting for longer periods than they actually do. Hence, children do not get a chance to practise these skills on their own. After 36 months of age, many Indian children are enrolled in schools for education. At school, they are directed to execute these skills mainly under the supervision of school support staff but without the same level of interference as that by parents. Simultaneously, in after-school programmes, parents build up the perception that their child must be independent in performing self-care skills, as the attainment of such skills becomes a matter of pride and self-hygiene. In response to this, the child starts practising self-care skills at home as well because they have been told to do so at home, and this finally helps with acquiring independence over time.

In the cognition domain, children needed moderate assistance until 48 months of age, which may be due to the late enrolment of children into school by 39–44 months of age and our education system that does not focus much on reading, writing or memorizing book contents during the initial years (first 1–1.5 years) of schooling. After 48 months of age, many children, by virtue of their self-perception capacity, would like to show to others that they have mastered a particular skill. Naturally, teachers and parents facilitate this achievement by the child, involving activities related to these two domains. Furthermore, the school education and peer group interactions push a child to relate to the activity skills performed by another child in these two domains.

We found that, for the mobility domain (out of all three subdomains), achieving a level of independence is easier than in the self-care and cognition domains. A similar pattern was also found among children of Hong Kong.<sup>7</sup> In the mobility domain, many children, from the age of 35 months onwards, require only minimal assistance (level 4). This could be related to the fact that children are uniformly similar regarding gross motor skills development globally. Culturally, the necessary environments are available at home. Therefore, the same skill level was seen.

For the total item rating of the WeeFIM scale, children require moderate levels of assistance (level 3) until 37 months of age for

performing functional activities. By the age of 38 months and onwards, children can demonstrate that they require minimal contact assistance (level 4) for performing functional skills and furthermore achieve complete independence (level 7) by the age of 83 months, which is common across all cultural groups.

In our culture, school selection is based on individual perception as well as the socioeconomic status of the parents. For the self-care domain, differences were significant in attaining 50%–74% of independence (level 3). Children at private schools started performing better in functional skills and acquired modified assistance by 43 months, whereas children at government schools scored comparatively less and could achieve level 3 independence by 49 months of age. This could be due to specific training for eating, grooming and dressing given to children along with academic activities in private schools.

Differences across all domains based on socioeconomic classes were not found in our study. A normative study performed in Hong Kong also showed that there was no effect of socioeconomic class on the attainment of the level of independence.<sup>7</sup>

The reference values of the WeeFIM instrument were obtained from children of urban setup. The study reference values may not completely reflect the functional ability of children from a rural setup. The scale was available only in English; even though we interviewed some parents/caregivers in Kannada, there was no official translation done in this language. This cross-cultural adaptation of the English version of WeeFIM into various local languages has a good scope for research in the future.

Future research can be done to measure the psychometric properties of the WeeFIM instrument locally and across India and additional studies can be performed with a large representative sample from multiple centres across India to form standard Indian normative data of WeeFIM for children.

Our study established reference values of the WeeFIM instrument for Indian (Mangalore) children aged 3–7 years (35–84 months), which can be used as a baseline to evaluate functional independence in these children. The reference values of the WeeFIM instrument from this study will assist clinicians and researchers in more accurately evaluating the functional independence of and in identifying the level of dependence in Indian children.

### Conclusions

The reference values of WeeFIM for children in India aged 3 to 7 years (35–84 months) were determined by us. The total item score of the WeeFIM instrument ranged between 88 and 126 for different age groups. It also revealed the performance of children in private schools to be better in comparison with that of children in government schools at an early age.

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*Conflicts of interest.* There are no conflicts of interest.

### REFERENCES

- 1 Ottenbacher KJ, Msall ME, Lyon N, Duffy LC, Granger CV, Braun S. Measuring developmental and functional status in children with disabilities. *Dev Med Child Neurol* 1999;**41**:186–94.

- 2 Chen CC, Bode RK, Granger CV, Heinemann AW. Psychometric properties and developmental differences in children's ADL item hierarchy: A study of the WeeFIM instrument. *Am J Phys Med Rehabil* 2005;**84**:671-9.
- 3 Msall ME, DiGaudio K, Duffy LC, LaForest S, Braun S, Granger CV. WeeFIM. Normative sample of an instrument for tracking functional independence in children. *Clin Pediatr (Phila)* 1994;**33**:431-8.
- 4 Feldman AB, Haley SM, Coryell J. Concurrent and construct validity of the Pediatric Evaluation of Disability Inventory. *Phys Ther* 1990;**70**:602-10.
- 5 Msall ME, Tremont MR. Measuring functional outcomes after prematurity: Developmental impact of very low birth weight and extremely low birth weight status on childhood disability. *Ment Retard Dev Disabil Res Rev* 2002;**8**:258-72.
- 6 Berg M, Jahnsen R, Frøslie KF, Hussain A. Reliability of the Pediatric Evaluation of Disability Inventory (PEDI). *Phys Occup Ther Pediatr* 2004;**24**:61-77.
- 7 Wong V, Wong S, Chan K, Wong W. Functional independence measure (WeeFIM) for Chinese children: Hong Kong Cohort. *Pediatrics* 2002;**109**:E36.
- 8 Uniform Data System. *The WeeFIM IITM Clinical Guide*. Ver. 6.0. Uniform Data System.
- 9 Msall ME, Rogers BT, Ripstein H, Lyon N, Wilczenski F. Measurements of functional outcomes in children with cerebral palsy. *Ment Retard Dev Disabil Res Rev* 1997;**3**:194-203.
- 10 Gunel MK, Mutlu A, Tarsuslu T, Livanelioglu A. Relationship among the Manual Ability Classification System (MACS), the Gross Motor Function Classification System (GMFCS), and the functional status (WeeFIM) in children with spastic cerebral palsy. *Eur J Pediatr* 2009;**168**:477-85.
- 11 Tur BS, Küçükdeveci AA, Kutlay S, Yavuzer G, Elhan AH, Tennant A. Psychometric properties of the WeeFIM in children with cerebral palsy in Turkey. *Dev Med Child Neurol* 2009;**51**:732-8.
- 12 Ireland PJ, McGill J, Zankl A, Ware RS, Pacey V, Ault J, *et al*. Functional performance in young Australian children with achondroplasia. *Dev Med Child Neurol* 2011;**53**:944-50.
- 13 Niemeijer AS, Reinders-Messelink HA, Disseldorp LM, Nieuwenhuis MK. Feasibility, reliability, and agreement of the WeeFIM instrument in Dutch children with burns. *Phys Ther* 2012;**92**:958-66.
- 14 Schneider JW, Gurucharri LM, Gutierrez AL, Gaebler-Spira DJ. Health-related quality of life and functional outcome measures for children with cerebral palsy. *Dev Med Child Neurol* 2001;**43**:601-8.
- 15 Ottenbacher KJ, Msall ME, Lyon N, Duffy LC, Ziviani J, Granger CV, *et al*. The WeeFIM instrument: Its utility in detecting change in children with developmental disabilities. *Arch Phys Med Rehabil* 2000;**81**:1317-26.
- 16 Aybay C, Erkin G, Elhan AH, Sirzai H, Ozel S. ADL assessment of nondisabled Turkish children with the WeeFIM instrument. *Am J Phys Med Rehabil* 2007;**86**:176-82.
- 17 Wrotniak BH, Epstein LH, Dorn JM, Jones KE, Kondilis VA. The relationship between motor proficiency and physical activity in children. *Pediatrics* 2006;**118**:e1758-65.
- 18 Haley SM, Coster WJ, Binda-Sundberg K. Measuring physical disablement: The contextual challenge. *Phys Ther* 1994;**74**:443-51.
- 19 Schneider E, Parush S, Katz N, Miller LJ. Performance of Israeli versus U.S. preschool children on the Miller Assessment for Preschoolers. *Am J Occup Ther* 1995;**49**:19-23.
- 20 Saleem SM. Modified Kuppuswamy socioeconomic scale updated for the year 2019. *Indian J Forensic Community Med* 2019;**6**:1-3.

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