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Abstract

Purpose. To investigate the validity and reliability of the Turkish translation of the original Pediatric Evaluation of Disability Inventory (PEDI).

Method. On May 2003, we received permission from Boston University to translate and use the PEDI for Research purposes. PEDI Functional Skills scale and Caregiver Assistance scale was administered by physiatrists to 573 healthy Turkish children (295 males and 278 females; the age range: 7 months to 7½ years) in two different healthcare centres in Ankara. The Turkish translation of the PEDI was again administered to 102 children after five days in order to assess test-retest reliability. Intraclass correlation coefficients (ICC) and Cronbach's alphas (α) were calculated. The test-retest reliability was assessed by Spearman's correlation coefficient. Internal construct validity was assessed by using Rasch unidimensional measurement model.

Results. High Cronbach's α coefficients (≥ 0.98), high ICC values (≥ 0.96) and high Spearman correlation coefficients (≥ 0.86) were found. The internal construct validity was confirmed by good fit to the Rasch measurement model. The fit statistics conducted in the study was acceptable, except for some items.

Conclusions. The Turkish translation of the PEDI is valid and reliable for the Turkish child population. We believe that PEDI is a detailed and useful instrument for the evaluation of efficiency of pediatric rehabilitation programme.

Keywords: *PEDI, Rasch analysis, validity, reliability*

Introduction

Various instruments are available in the pediatric rehabilitation field, developed for the determination of appropriate treatment as well as efficiency. The most popular of these instruments used in clinical evaluation, monitoring and documentation of the outcomes is The Pediatric Evaluation of Disability Inventory (PEDI) [1] and WeeFIM® instrument [2].

The PEDI was developed by Haley et al. for the evaluation of functional status of children aged between 6 months and 7½ years [1]. The PEDI includes three sets of measurement scales: Functional Skills, Caregiver Assistance, and Modifications. The Functional Skills Scales were designed to sample meaningful sub-tasks of a set of complex functional activities. The Caregiver Assistance Scale is a measure of the extent of help the caregiver provides in typically daily situations. The Modifications Scale is a measure of environmental modifications and equipment used by the child in routine daily activities. Each individual scale is designed to capture a different aspect of the child's function in self-care, mobility and social function domains. The PEDI consists of 197 functional skill items, and 20 items that assess caregiver assistance and modifications [1].

Instruments to be used in evaluation of child functions should be adapted to the society where they are used according to the religion, language and socio-cultural aspects of the concerning society, and their validity and reliability should be proven. In our country, the need for assessment measurements that

can be used in clinical applications and researches in pediatric rehabilitation field gradually increases. However, no study has been carried out so far on the validity and reliability of the PEDI in Turkey. Our purpose in this study was therefore to investigate the validity and reliability of the Turkish translation of the original PEDI.

Method

Translation procedure

On May 2003, we received permission from Boston University to translate and use the PEDI for Research purposes. PEDI package consisting of a manual, a score form and the software program (which was used for program data entry, scoring and generation of individual summary score profiles) was obtained.

The PEDI manual and score form were translated into Turkish by a physiatrist with advanced English and an English teaching professor who had lived in the USA. The Turkish translation of the score form was then translated back into English by another team consisting of a professional technical translator and a physiatrist who was fluent in English.

All texts were then compared with each other by a team working in the pediatric rehabilitation field. Professional views of physiotherapists and psychologists were also obtained. Measurement units in "feet" in items 40 through 44 in the mobility domain of the Functional Skills Scale and in the mobility domain of the Caregiver Assistance Scale, E and F were converted to "meter" units during translations. No other changes were made in the original PEDI, and no items were added or removed. The same team also worked on translation of the PEDI manual. Therefore, the final Turkish translation of the PEDI was formed. A physiatrist from the team was designated to apply the final Turkish translation of the original PEDI.

Subjects

A total of 573 healthy Turkish children aged between 7 months and 7½ years, consisting of 295 (51.5%) males and 278 (48.5%) females, was included in the study. They were sampled from two different healthcare centres in Ankara, where they were brought in for routine health checks and vaccinations. Only the children who had no illness and who were not using any medication were included in the study. The purposes and procedures of the study were explained to the children's families and informed consent was obtained from the parents. The PEDI was performed by the same physiatrist with all the children, by combining direct observa-

tion of the children with interviews held with caregivers. The same physiatrist performed PEDI again 5 days after the initial procedure, on 102 (17.8%) children selected from the study group of 573 children.

PEDI

The PEDI includes three sets of measurement scales: Functional Skills, Caregiver Assistance, and Modifications. Each PEDI scale is self-contained and can be used separately or in combination with the other scales.

Functional Skills (FS) Scales. This scale consists of 197 items in total, divided as 73 items in the self-care domain, 59 items in mobility domain, and 65 items in social function domain. Each item in this part is scored as unable (0) or capable (1) [1].

Caregiver Assistance (CA) Scales. It consists of 20 domains in total, divided as 8 items in the self-care domain, 7 items in mobility and 5 items in social function domains. Caregiver assistance for each item is rated from 5 (independent) to 0 (totally dependent), yielding an aggregate score for each domain [1].

Modification (M) Scales. The same 20 items as in Caregiver Assistance section are rated on the modifications part (i.e., environmental or technical adaptations required to facilitate performance) as follows: N (none), C (child-oriented modification), R (rehabilitation equipment or assistive devices required), or E (extensive modifications required). The Modification section of the PEDI is not a true measurement scale, but rather a frequency count of the type and extent of environmental modifications the child depends on to support functional performance [1].

In summary, the PEDI consists of three Functional Skills Scales, three Caregiver Assistance Scales, and three Modification Scales in the content areas of self-care, mobility and social function. These subscales are FS self-care (FS-sc), FS mobility (FS-m), FS social function (FS-sf), CA self-care (CA-sc), CA mobility (CA-m) and CA social function (CA-sf), M self-care (M-sc), M mobility (M-m), M social function (M-sf). No formal scaling technique was applied to the three Modification Scales, as they represent only frequency counts of modifications within each content area. Thus, the Modification section was not employed for evaluation in this study [1].

In the present study, the PEDI software program was used for data storage and for the generation of individual score profiles. This way, 6 subscale raw

scores were obtained as follows: FS-sc, FS-m, FS-sf, CA-sc, CA-m and CA-sf. The raw scores of these six subscale were used in the statistical analyses.

Assessment of reliability

Reliability is the consistency or repeatability of the measures and depends on how much of the variation in measures is attributable to random or chance errors. Internal consistency of the Turkish translation of the PEDI was provided by Cronbach's alpha (α) coefficient, which provides an indication of the connectedness of items within a scale. Overall reliability was assessed by intraclass correlation coefficient (ICC) (one way random effect model) [3]. The test-retest reliability was assessed by Spearman's correlation coefficient.

Assessment of internal construct validity

Internal construct validity was assessed by using Rasch unidimensional measurement model [4–6]. The Rasch model is a unidimensional model which asserts that the easier the item (task) the more likely it will be passed, and the more able the person, the more likely they will pass an item (or be able to do a task) compared to a less able person. The Rasch measurement model estimates the "ability" measure of person n (B_n), the "difficulty" measure of item i (D_i), and the "threshold" parameter between adjacent categories (0.5 probability point, F_j) on a common logit scale. The polytomous rating scale model is as below:

$$\log\left(\frac{P_{nij}}{P_{nij-1}}\right) = B_n - D_i - F_j$$

where P_{nij} is the probability that person n encountering item i is observed in category j.

The Rasch measurement model transforms the ordinal raw scores into interval measures which are objective, fundamental, and linear. Rasch measures provide more information than the observed raw scores, because it provides sample-free item difficulties and test-free person measures. This means that the abilities of persons being tested are estimated by isolating the item difficulty and quality, and item difficulties are estimated by isolating the ability of persons being tested. The Rasch measurement model can also identify items that are redundant and those that do not fit to the model. Two indicators of fit are mean square OUTFIT and mean square INFIT statistics. These statistics are measures of how well a PEDI item fits to the Rasch model. INFIT is an information-weighted form of outfit. OUTFIT is sensitive to extremely unexpected or rare responses to items far from a patient's ability

level, while INFIT is sensitive to irregular patterns of responses to items matching the patient's ability level. The reasonable item mean square ranges for INFIT and OUTFIT is from 0.6–1.4 and these statistics are standardized to a mean of zero and standard deviation of one.

Data were analysed by using SPSS for Windows 11.5 and a Rasch-Model Computer program WINSTEPS [7,8]. Fitting level of items to Rasch model was examined separately for each of the six subscales. In order to compare the level of difficulties in our study with the difficulty hierarchy defined in PEDI manual and to interpret them more easily, Rasch was converted in 0–100 model.

Results

Characteristics of subjects

In total, 573 healthy Turkish children aged between 7 months and 7½ years (mean age ± SD: 39.07 ± 23.94 months) were included in the study. The study group consisted of 295 (51.5%) males and 278 (48.5%) females. Mothers (95.6%) were the major caregivers interviewed during PEDI procedure, followed by fathers (2.6%) and relatives (1.7%). The 102 children group re-assessed 5 days after consisted of 47 (46.1%) were males and 55 females (53.9%), with a mean age of 43.13 ± 24.08 months.

PEDI scores of all children in the study are shown in Table I, together with their six-month age intervals as in the format given in the original PEDI.

Reliability

Cronbach's α value for FS-sc, FS-m and FS-sf subscales were found as 0.99, while it was found 0.99 for CA-sc, and 0.98 for CA-m and CA-sf subscales. Overall reliabilities were satisfactory as expressed by the ICC of 0.99 for FS-sc, FS-m and FS-sf. Values of ICC were found as 0.98 for CA-sc subscale, 0.97 for CA-m and 0.96 for CA-sf subscales. P values and the correlation between the first and second evaluations of PEDI subscales, representing the test-retest reliability of the Turkish translation of the PEDI, are given in Table II.

Internal construct validity

Internal construct validity of the Turkish translation of the PEDI by Rasch model. Fitting degree of the items to the Rasch model was examined separately for six subscales. Those items among these subscales that are misfit are shown in Table III.

Order of difficulty levels of the items in FS-sc, FS-m and FS-sf subscales is shown respectively in

Table I. PEDI scores of 14 age groups in 6-month intervals and of all children in the study.

Age (years)	No (F/M)	FS-sc Mean ± SD (min-max)	FS-m Mean ± SD (min-max)	FS-sf Mean ± SD (min-max)	CA-sc Mean ± SD (min-max)	CA-m Mean ± SD (min-max)	CA-sf Mean ± SD (min-max)
0.5–0.9	88 (41/47)	7.53 ± 3.60 (2–21)	5.30 ± 5.54 (1–46)	6.20 ± 3.71 (1–24)	1.85 ± 2.12 (0–10)	2.10 ± 3.61 (0–23)	2.25 ± 1.86 (0–9)
1.0–1.4	75 (33/42)	13.68 ± 5.45 (4–30)	24.97 ± 15.14 (1–49)	12.24 ± 5.75 (3–26)	3.49 ± 3.16 (0–13)	11.67 ± 9.15 (0–29)	5.74 ± 3.61 (0–15)
1.5–1.9	42 (24/18)	25.24 ± 9.19 (10–58)	42.02 ± 8.42 (6–56)	24.07 ± 8.94 (8–51)	11.57 ± 7.32 (2–35)	22.83 ± 5.91 (1–33)	11.83 ± 4.48 (3–24)
2.0–2.4	30 (16/14)	37.93 ± 10.69 (21–62)	50.07 ± 4.15 (41–57)	36.57 ± 12.02 (13–56)	19.20 ± 7.55 (3–38)	27.87 ± 3.70 (19–33)	17.57 ± 3.90 (10–25)
2.5–2.9	38 (16/22)	51.58 ± 11.13 (23–70)	52.66 ± 4.33 (39–57)	47.61 ± 10.49 (14–61)	27.13 ± 8.61 (5–40)	30.29 ± 3.59 (17–33)	19.26 ± 3.81 (6–24)
3.0–3.4	39 (15/24)	56.18 ± 8.10 (30–69)	54.77 ± 2.47 (49–59)	52.82 ± 5.57 (42–63)	31.23 ± 4.31 (22–38)	31.72 ± 2.05 (25–35)	21.36 ± 2.49 (15–25)
3.5–3.9	45 (23/22)	62.69 ± 7.07 (43–72)	55.84 ± 1.93 (49–59)	56.96 ± 4.02 (45–63)	34.76 ± 4.07 (24–40)	32.24 ± 1.93 (24–35)	22.02 ± 1.93 (16–25)
4.0–4.4	45 (28/17)	65.51 ± 5.24 (53–73)	56.49 ± 1.59 (52–59)	57.29 ± 4.41 (46–63)	36.56 ± 3.05 (30–40)	33.02 ± 1.09 (29–35)	22.33 ± 1.66 (17–25)
4.5–4.9	35 (18/17)	65.43 ± 6.98 (43–73)	56.86 ± 1.66 (52–59)	59.09 ± 6.19 (27–65)	37.26 ± 2.98 (30–40)	33.23 ± 1.06 (30–35)	23.11 ± 1.99 (14–25)
5.0–5.4	32 (15/17)	68.75 ± 4.42 (54–73)	57.28 ± 1.30 (53–59)	60.00 ± 3.27 (53–65)	38.72 ± 2.00 (33–40)	33.41 ± 1.04 (31–35)	23.53 ± 1.31 (20–25)
5.5–5.9	28 (14/14)	69.50 ± 4.99 (47–73)	57.71 ± 1.35 (53–59)	61.43 ± 2.47 (55–65)	38.93 ± 3.06 (24–40)	33.82 ± 1.05 (32–35)	23.43 ± 1.528 (19–25)
6.0–6.4	40 (18/22)	71.10 ± 1.98 (66–73)	58.25 ± 0.98 (57–59)	62.50 ± 1.89 (59–65)	39.40 ± 1.05 (36–40)	34.28 ± 0.96 (33–35)	23.55 ± 1.73 (15–25)
6.5–6.9	18 (8/10)	71.39 ± 1.46 (68–73)	58.39 ± 0.91 (57–59)	63.11 ± 1.77 (59–65)	39.28 ± 1.12 (36–40)	34.61 ± 0.69 (33–35)	24.17 ± 0.85 (23–25)
7.0+	18 (9/9)	71.67 ± 2.05 (66–73)	58.33 ± 0.97 (57–59)	63.72 ± 1.90 (59–65)	39.56 ± 0.98 (36–40)	34.33 ± 0.97 (33–35)	24.61 ± 0.60 (23–25)
0.5–7½	573 (278/295)	44.74 ± 25.78 (2–73)	43.05 ± 20.36 (1–59)	40.27 ± 23.00 (1–65)	23.69 ± 15.88 (0–40)	24.42 ± 12.62 (0–35)	16.19 ± 8.77 (0–25)

F, female; M, male; FS, Functional Skills; CA, Caregiver Assistance; sc, self-care; m, mobility; sf, social function; min, minimum; max, maximum; SD, standard deviation.

Table II. Test-retest reliability results of the Turkish translation of the PEDI.

	Spearman's rho	p
FS-sc (1) – FS-sc (2)	0.97	< 0.001
FS-m (1) – FS-m (2)	0.92	< 0.001
FS-sf (1) – FS-sf (2)	0.97	< 0.001
CA-sc (1) – CA-sc (2)	0.95	< 0.001
CA-m (1) – CA-m (2)	0.86	< 0.001
CA-sf (1) – CA-SF (2)	0.86	< 0.001

FS, Functional Skills; CA, Caregiver Assistance; sc, self-care; m, mobility; sf, social function; (1) The first assessment; (2) The second assesment; Spearman's rho, Spearman's correlation coefficients.

Figures 1, 2, and 3. The easiest item in FS-sc subscale was "eats pureed/blended/strained foods" (item no. 1). Other easier items following this item were "finger feeds" (item no. 5) and "eats ground / lumpy foods" (item no. 2) items. The most difficult item was "ties shoelaces" (item no. 58) (Figure 1). The easiest item in the FS-m subscale was "Chair/ Wheelchair transfers: sits if supported by equipment or caregiver" (item no. 6), while the most difficult items were "manages seat belt or chair restraint" (item no. 14) and "gets in and out of car and opens and closes car door" (item no. 15) (Figure 2). The easiest item in the FS-sf subscales was "orients to sound" (item no. 1), while the difficult items were "crosses busy street safely without an adult" (item no. 60) and "can state full home address; if in hospital, name of hospital and room number" (item no. 44) (Figure 3).

Discussion

The Pediatric Evaluation of Disability Inventory (PEDI) is primarily designed for the functional evaluation of young children [1]. It is a sensitive measurement method used to evaluate rehabilitation outcomes of children with brain injury and to indicate their functional changes [9–12]. Acquired brain injury (ABI)-specific PEDI scale was developed to measure functional change in children with ABI, while PEDI mobility classification system was developed to assess mobility of children with ABI [11,12].

The PEDI has been used in children with cerebral palsy, in order to assess their activities of daily living, to measure their rehabilitation outcomes and the effects of intrathecal baclofen, Botulinum toxin type A and selective dorsal rhizotomy treatments [13–19]. In this study, we investigated the reliability and validity of the PEDI instrument for Turkish children, before using it in our daily practice and studies.

The Turkish translation of the original PEDI was employed in this study, without making any changes in its original form other than conversion of "feet"

Table III. The misfit items of Functional Skills and Caregiver Assistance Scales.

| Misfit items	Difficulty	INFIT (MNSQ)	OUTFIT (MNSQ)
Functional Skills Self-care Scale			
35. Washes body thoroughly, not including face	86.09	1.73	1.94
68. Consistently stays dry day and night	84.14	1.82	2.36
16. Holds toothbrush	66.02	1.42	0.99
25. Blows nose into held tissue	60.74	1.16	2.01
8. Uses a fork well	60.49	1.56	0.72
21. Brings brush or comb to hair	46.76	1.37	2.08
24. Allows nose to be wiped	33.84	1.49	2.29
1. Eats pureed/blended/strained foods	−0.03	1.14	9.90
Functional Skills Mobility Scale			
14. Manages seat belt or chair restraint	99.98	1.04	9.90
15. Gets in and out of car and opens and closes car door	99.98	1.04	9.90
11. Moves in car; scoots on seat or gets in and out of car seat	41.89	1.97	8.93
2. Sits unsupported by equipment or caregiver	38.71	3.46	8.15
8. Gets on and off low chair or furniture	38.42	2.26	1.42
21. Sits unsupported and moves in tub	37.81	2.01	1.48
17. Comes to sit at edge of bed; lies down from sitting at edge of bed	28.01	1.79	1.23
20. Sits if supported by equipment or caregiver in a tub or sink	22.71	1.84	9.90
7. Sits unsupported on chair or bench	20.35	1.49	9.90
16. Raises to sitting position in bed or crib	15.39	1.04	6.99
1. Sits if supported by equipment or caregiver	10.21	1.47	2.64
Functional Skills Social Function Scale			
60. Crosses busy street safely without an adult	99.98	1.14	1.77
44. Can state full home address; if in hospital, name of hospital and room number	99.76	1.15	9.90
58. When crossing the street with an adult present, child doesn't need prompting about safety rules	88.10	1.17	1.41
50. Regularly checks clock or asks for the time in order to keep track of schedule	82.90	0.95	9.90
49. Associates a specific time with actions/events	79.85	0.88	9.90
48. Has very simple time concepts	73.76	1.04	6.82
43. Provides names and descriptive information about family members	68.85	0.84	3.50
22. If upset because of a problem, child must be helped immediately or behavior deteriorates	58.02	0.95	9.90
46. Has a general awareness of time of mealtimes and routines during the day	57.76	1.43	1.34
56. Shows appropriate caution around stairs	57.49	1.41	8.02
61. Child may play safely at home without being watched constantly	55.61	1.12	2.82
18. Uses two words together with meaning	52.39	0.89	7.32
27. Initiates a familiar play routine	40.59	1.40	0.81
7. Understands 1-steps commands with words that describe people or things	35.47	0.60	1.52
32. Interacts with other children in simple and brief episodes	32.20	1.69	1.60
31. Notices presence of other children may vocalize and gesture towards peers	9.22	1.00	9.90
26. Shows awareness and interest in others	3.12	1.05	4.36
1. Orients to sound	−0.02	1.28	9.90
Caregiver Assistance Self-care Scale			
A. Eating: eating and drinking regular meal; do not include cutting steak, opening containers or serving food from serving dishes	−0.06	1.31	1.92
Caregiver Assistance Mobility Scale			
A. Chair/Toilet transfers: child's wheelchair, adult-sized chair, adult-sized toilet	37.21	1.62	2.83
Caregiver Assistance Social Function Scale			
A. Functional Comprehension: understanding of requests and instructions	0.05	1.75	2.66

MNSQ, mean square.

Functional Skills Self-care
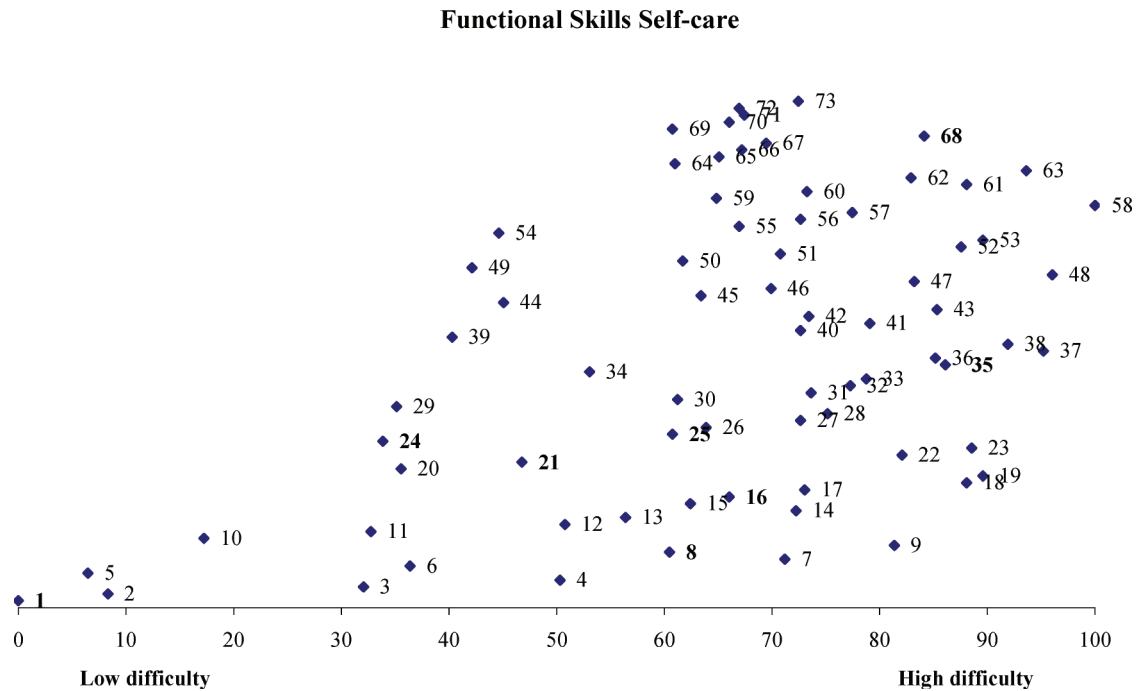
Figure 1. Item difficulties of the Turkish translation of the PEDI for Functional Skills-self-care subscale. Bold numbers indicate misfit items.
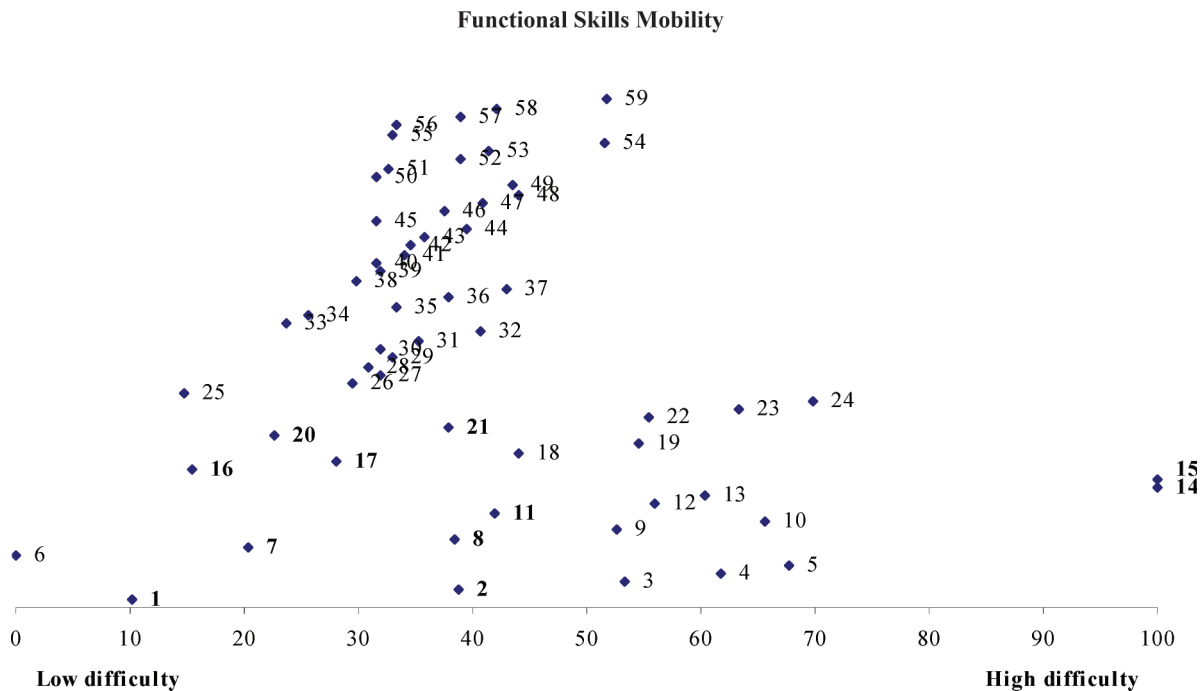
Functional Skills Mobility

Figure 2. Item difficulties of the Turkish translation of the PEDI for Functional Skills – mobility subscale. Bold numbers indicate misfit items.

units into ''meter'' units in the Metric System. Metric System was also used in The Netherlands to prepare the Dutch PEDI, with the addition of four items during the adaptation works, thus resulting in a 201-item Dutch PEDI [20,21].

The PEDI was standardized by Haley et al. by obtaining normative data for 412 American non-

disabled children, aged between six months and 7½ years [1]. Cronbach's α coefficients found during the standardization for FS-sc, FS-m and FS-sf were calculated respectively as 0.99, 0.97 and 0.98. Our Cronbach's α coefficients for the FS subscale was fully in agreement with the original PEDI coefficients (0.99 for self-care, mobility and social function
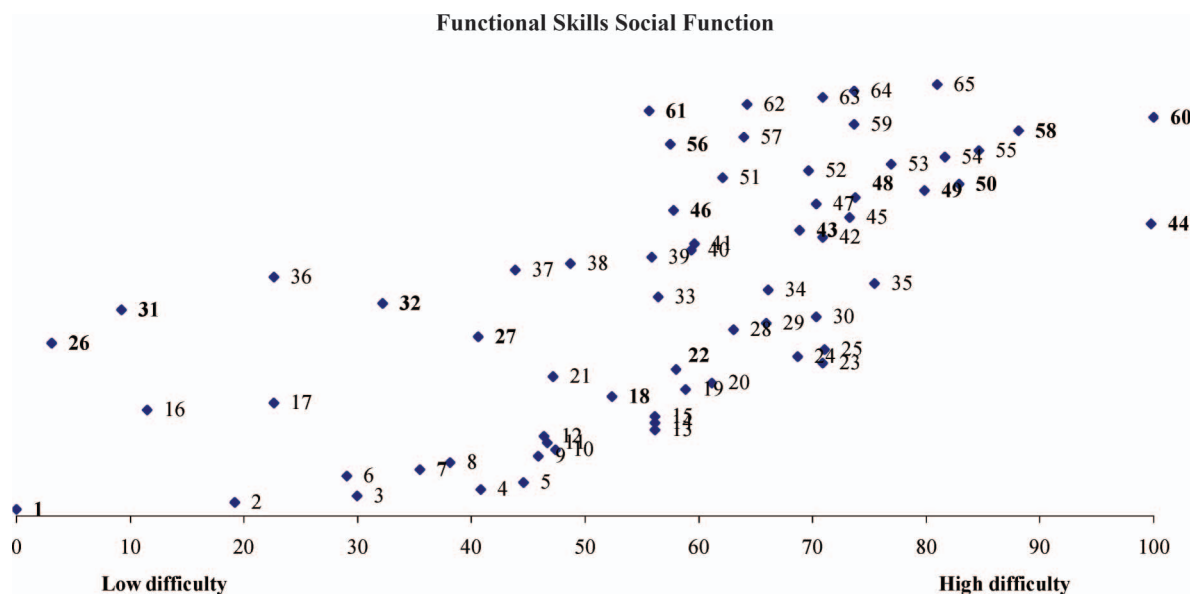
Figure 3. Item difficulties of the Turkish translation of the PEDI for Functional Skills-social function subscale. Bold numbers indicate misfit items.

domains). The Dutch PEDI seems to have calculated lower Cronbach's alpha values for FS subscale (respectively 0.89, 0.74 and 0.87) [22]. While Cronbach's α coefficients for CA scale of the original PEDI were 0.97 for CA-sc and 0.95 for CA-m and CA-sf, we found higher Cronbach's α coefficients for CA scales (respectively 0.99, 0.98 and 0.98). High Cronbach's α coefficients (≥0.98) and high ICC (≥0.96) values were found in our study, which indicated a good reliability for the Turkish translation of the PEDI. Test-retest reliability in our study was also found to be good.

The validity and reliability of the original PEDI in USA has been shown long ago [1,23]. During recent years, the PEDI has been employed in several countries, in studies investigating its validity and reliability. Such researches have indicated that there may be some society differences among countries. For example, since children often use bicycles as a principal means of transport for going to school or shopping in The Netherlands, bicycling was added in the FS-m domain in the Dutch PEDI [20]. Bicycling skills were also stated to be an important skill in Slovenia and Sweden [24,25]. In our country, bicycling is not the principal transport means for children, but we also consider it as an important skill. PEDI was also translated into the national languages in Spain and Norway for validity and reliability investigation [26–28].

In our study, internal construct validity was confirmed by good fit to the Rasch measurement model. The fit statistics conducted in the study was acceptable, except the items shown in Table III. Rasch probabilistic rating scale model was used in

the development and construction of the PEDI scales [1]. Since we were unable to encounter any study in the literature using the Rasch unidimensional measurement model to evaluate internal construct validity of PEDI, we could not compare out misfit items with the results of other societies. However, Rasch analysis was used in studies with various purposes related with PEDI. For example, Rasch analysis was used to investigate cross-cultural validation of the Dutch translated PEDI [21] and to measure functional changes in children with ABI [11].

In the study, we found the item entitled "Washes body thoroughly, not including face" (item no. 35) in the FS-sc subscale to be misfit. This item is a relatively difficult one as compared with other items in the FS-sc subscale. In Turkish culture, even the child grows up and has ability to wash his/her body, some Turkish mothers do not allow self-bathing of their children due to safety and hygiene reasons, and help them bathing. This approach by families may explain the misfit status of this item. Misfit status of item entitled "Eats pureed/blended/strained foods" (item no. 1) may be due to the fact that this item is the easiest item, in contrast to item no. 35, because, even infants with lower ability may eat pureed food. This can continue with higher ages also.

The most difficult items of the FS-m subscale, "Manages seat belt or chair restraint" (item no. 14) and "Gets in and out of car and opens and closes car door" (item no. 15), were also found to be misfit. The fact that some families in our study do not possess a car and that the children of these families may not have performed this activity before could

explain the performance level of this activity. In addition, because of the protective approach of Turkish families, parents assist children in such activities related with children's safety. The first item in the FS-m subscale is the second easiest item of this subscale. Seating on toilet when supported by equipment or by a caregiver is an easy activity starting at early ages and continuing later, which may explain the misfit status. Social and cultural differences among the societies as well as families' approaches toward their children affect functional performances of children [21]. For example, Srsen et al. reported that Slovene children obtained lower scores than their American peers in item no. 14 (Manages seat belt or chair restraint) and in item no. 24 (Steps/transfers into and out of an adult-sized tub) in the FS-m subscale, which was attributed to Slovene parents being more cautious [24].

The misfit item in FS-sf subscale, "Orients to sound" (item no. 1), is an ability acquired since infancy period. The other misfit items in this subscale, "Shows awareness and interest in others" (item no. 26) and "Notices presence of other children may vocalize and gesture towards peers" (item no. 31), are also the abilities acquired at quite early ages and continued at higher ages. The misfit status of item no. 60 entitled "Crosses busy street safely without an adult" is attributed to the intense traffic in Ankara and to the fact that parents do not allow their children to step into streets alone. Another misfit item was item no. 44 in the FS-sf subscale, "Can state full home address; if in hospital, name of hospital and room number". We ascribe this situation to the fact that home addresses are made up of a long structure composed of roads, streets, districts, towns and provinces, which makes it difficult even for older children to know definitely their home address. This item was also the second difficult one in the study. However, it is the most difficult seventh item in the original PEDI item hierarchy.

We converted Rasch into 0 – 100 model in order to define better the level of difficulties in our study and to compare them with the difficulty hierarchy defined in PEDI manual. Our items hierarchy was found to be very similar to the one shown in Appendix III of the PEDI manual. While the easiest items in our study were item nos. 1, 5, 2 and 10 in the FS-sc subscale, these were ranked as 1, 10, 5 and 20 in the PEDI manual. The most difficult items in this subscale were respectively 58, 48, 37 and 63, while the same order was 23, 58 and 63. As for the FS-m subscale in our study, the easiest items were ranked as 6, 1, 25 and 16, while the same order was as 6, 1, 25 and 16 in the PEDI manual. Our most difficult items in this subscale were item nos. 14 and 15, with scaled scores being around 100. In the PEDI manual, scaled scores of item nos. 14 and 15 were between 80 and

90. Our item map in the FS-sf subscale was similar to the one given in the PEDI manual.

Internal consistency, overall reliability and test-retest reliability of the Turkish translation of the PEDI were all good. In our study, mean scores of healthy Turkish children were calculated by dividing them into 14 age groups of six-month intervals, but their normative data were not calculated. In the next stage, we are planning to calculate PEDI normative scores for our country and to apply them to disabled children before and after rehabilitation. We believe that PEDI is a detailed and useful instrument for the evaluation of efficiency of pediatric rehabilitation programs. Although the lengthy structure of PEDI seems somewhat disadvantageous at first glance, we think that its structure, with clear questions not allowing any interpretation by the applier is, in fact, superior. Further studies are required to determine the cross-cultural validity of the Turkish translation of the PEDI instrument.

Acknowledgements

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