ORIGINAL ARTICLE

# Translation and Validation of Pediatric Functional Independence Measure Scale in Urdu Language among Preterm Children

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## ABSTRACT

**Aim:** To translate and validate the Pediatric Functional Independence Measure (WeeFIM) scale in Urdu language among preterm children for the purpose of cross cultural adaptation.

**Methods:** The validation study was carried out at Lahore College of Physical Therapy (LMDC). In Lahore, the existent English version of the WeeFIM scale, already validated as an excellent tool for measuring functional limitations in the pediatric population, was forward and backward translated into the Urdu language to test its validity and cross-cultural adaptation as per Bombardier, Beaton, and Guillemin's guidelines. Forward and backward translation was conducted by two independent translators with adequate credentials; one of the translators was a professor of Urdu literature and the other was a medical professional working in the field. A final Urdu version of the WeeFIM scale was created and discrepancies were resolved by bilingual experts, which were validated by an expert panel of 10 therapists. The validated version was then tested on a sample size of 52 children with a history of preterm birth in next phase to determine the reliability of Urdu version of instrument.

**Results:** The Cronbach's alpha for the Urdu version of WeeFIM was calculated to be 0.965 after translation, while Cronbach's alpha after application to preterm children was 0.837. The inter-item correlation after application to the concerned population was calculated to be 0.636, 0.523, and 0.754 for all three domains, respectively.

**Conclusion:** Urdu version of WeeFIM scale is valid and reliable tool for preterm children.

**Keywords:** Translation, Validation, Preterm children, WeeFIM-I, WeeFIM-II.

## INTRODUCTION

Different instruments are now a day used to assess the health status of children with functional and developmental disabilities. Every one of these instruments measure limitations and functional abilities of children while performing daily living activities[1].

One of the instruments used currently for children who are at risk of disabilities is Pediatric Functional Limitation Measure (WeeFIM) scale. It is an adapted version of functional independence measure (FIM). FIM was originally developed by National Task Force for medical rehabilitation in 1983 which was known for measuring functional independence in adults and also assess severity of disability[2].

WeeFIM is an 18-item instrument. These items are divided into 6 domains (self-care, transfer, sphincter control, locomotion, social cognition and communication).It consists of three dimension (motor, behavior and cognitive)[3]. This scale is most commonly used to assess the functional limitations in premature children during daily living.

It is a 7-level rating system which ranges from 7 (complete independence) to 1 (total assistance). WeeFIM is used to measure a child's performance in everyday life for functional skills. It is proven to be very helpful in measuring functional independence for the children at the ages of 6 months to 7 years. It can also assess the developmental disabilities in the children aged 6 months-21 years. The advantage of WeeFIM scale is that it is less time consuming and provides more relevant information which is required for evaluating the functional outcomes in children with disabilities. Another advantage is that this scale is discipline free, so it can be administered by health care professionals, pediatrician, rehabilitation specialist and physical therapists as well[2].

All over the world, an average of 15 million babies were born that are preterm yearly. Prematurity is said to be the main reason for neonatal mortality and second cause for death in children before the age of 5 years. Among these children about 5% are born before 28 weeks (extremely preter). 15% are born between

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28 to 31 weeks and 20% at 32 to 33 weeks and almost 60%-70% are born between 34 to 36 weeks of gestation[4].

Globally, the prevalence of preterm birth is about 9.6%. Whereas, in an under developed country like Pakistan it is much higher which is up to 15.7%[5]. Studies have shown that these children show poor social and interactive skills. And reduced attention and functional limitations are the main and common problems with premature children[4].

Survival in the early premature children has been improved vastly over past couple of decades. It is because of the extensive perinatal and neonatal care. It has been confirmed in many studies that these children have more chances of developing a neurosensory impairment as compared to their term peers. In the absence of intellectual, motor and sensory disabilities, minor motor disabilities do occur in 5-15% of normal birth weight babies but the rate is much higher in children born preterm. Along with major motor and sensory disabilities these children also sometimes suffer from associated problems like learning disabilities, poor social skills and low self-esteem[6].

The WeeFIM is administered by the way of direct observation, interview or a combination of both. WeeFIM has been used exclusively in pediatric rehabilitation which includes premature individuals including children with cerebral palsy, spina bifida, genetic impairments and pediatric burns.[1] WeeFIM is the most common and popular instrument to measure the functional ability of children with cerebral palsy. This instrument can assess adequately child's level of independence during activity and participation in everyday living[3].

WeeFIM scale is widely used in Pakistan for assessment of functional status in disabled and non-disabled children. In this study we focus on premature children who present with or without disabilities. The age group used in this study is 1-7 years.WeeFIM has been translated in many other languages previously which includes Turkey, Chinese, Korean etc. but not in Urdu language. WeeFIM has been validated for American children but because of the vast cultural and environmental differences among America and Pakistan, the normative data for Pakistani children was needed.

The rationale of this study was to translate the WeeFIM scale into Urdu language and to investigate psychometric

properties of WeeFIM in preterm children in Pakistan which will help the clinicians and caregivers to easily apply the scale without linguistic barriers.

## MATERIAL AND METHODS

Cross cultural linguistic validation study was conducted in which the original Pediatric Functional Independence Measure Scale (WeeFIM) was translated into target language i.e., Urdu Language (forward translation) by two independent translators[7], one translator was familiar with the concept of the questionnaire and had a medical background and the other translator was not familiar with the questionnaire but both were bilingual. Two translated versions of the questionnaire were created and then both translations were compared[8]. Blind backward translation of these two initially translated versions of questionnaire were conducted and compared. The final version examined by expert panel and full psychometric testing of the pre-final version of translated version in a sample of 52 of target population (preterm children and their caregivers at Ghurki Trust and Teaching Hospital, Lahore and COMPASS Special School, Lahore) who fulfill inclusion criteria that includes children with preterm birth with or without any visible disability[9]. Children of 4 to 7 years of age and parents with preterm child who understands Urdu language. Sample size is calculated by using World Health Organization (WHO) software under the following formula with 0.05 prevalence (P) 95% confidence interval (1-α) and 0.10 precision (d). The sample size was 52. A prior consent was taken from parents before testing. Data was analyzed by using SPSS version 23. The study variables were presented in the form of descriptive statistics. Permission from the Ethics Committee of the LCPT was obtained.

## RESULTS

**Reliability Statistics:**
**Internal Consistency:** After translation the final Urdu version was examined by expert panel, psychometric properties were assessed and the Cronbach's alpha of translated version of WeeFIM scale turned out to be 0.965.

| Cronbach's Alpha | .965 |
|---|---|
| Number of Items | 144 |

Inter-Rater and Intra-Rater reliability: The Intra-class Correlation coefficient ranged from 0.024 to 0.637 after testing on preterm population.

| Intraclass Correlation Coefficient | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Intraclass Correlation | 95% Confidence Interval | | F Test with True Value | | | |
| | | Lower Bound | Upper Bound | Value | df1 | df2 | Sig |
| Single Measures | .024 | .013 | .043 | 2.758 | 51 | 3621 | .000 |
| Average Measures | .637 | .482 | .765 | 2.758 | 51 | 3621 | .000 |

**Inter-item correlation:** The inter-item correlation after data application of the Urdu-version of WeeFIM of three domains that were motor, behavioral and cognitive with total score of WeeFIM was 0.636, 0.523 and 0.754 respectively. The p-value for all these three domains was (p=0.000) which was less than 0.05 denoting significance.

| Domains/Wee Film | Statistics | Total score of WeeFIM |
|---|---|---|
| Motor | Pearson correlation | .636 |
| | Sig. (2-tailed) | .000 |
| | N | 52 |
| Behavioral | Pearson correlation | .523 |
| | Sig. (2-tailed) | .000 |
| | N | 52 |
| Cognitive | Pearson correlation | .754 |
| | Sig. (2-tailed) | .000 |
| | N | 52 |

## DISCUSSION

The Pediatric Functional Independence Measure (WeeFIM) is a validated instrument which is used for measuring the functional progress of children in America with multiple neurodevelopmental disorders[10]. WeeFIM scale has been translated and validated into many languages over the years including Turkish, Chinese, Korean and Brazilian. Uptill now, there is no evidence on the validity and reliability of WeeFIM scale in Urdu language. The aim of this study is translation of WeeFIM scale in Urdu language and investigation of its internal content validity and reliability. Translation of this scale in Urdu language will help with overcoming the linguistic and cultural barriers and help clinicians and caregivers to better understand and apply WeeFIM and identify potential limitations in children with preterm birth[3]. This study follows the guidelines of Beaton and Gulliman for translation and validation of Urdu version of WeeFIM scale[11]. In this study the researcher have targeted content validity which shows the degree to which the items are co-related.

In the original version, WeeFIM instrument consists of 18 items which are then divided into 6 subscales (self-care, transfer, locomotion, social cognition, sphincter control, communication) but in 2005 and in 2007 Chen et al and Aybay et al divided the instrument into motor and cognitive subscales[12].

The scale was divided into three domains cognitive, motor and behavioral. In this study, the inter-item correlation of cognitive, motor and behavioral domains is determined. The Pearson co-relation 'r' for all three domains were assessed which was 0.770 for motor, 0.829 for behavioral and 0.909 for cognitive domains which is shown in Table 6.2. So the content validity for the Urdu version-I of WeeFIM scale was found to be in good co-relation with the total as according to Portney and Watkins criteria who used to interpret the correlation as follows: 'r' less than or equal to 0.25 indicates little or no correlation, 'r' more than or equal to 0.50 and less than or equal to 0.75 indicates moderate correlation, 'r' more than or equal to 0.75 and less than or equal to 1 indicates good correlation. Cronbach's Alpha after translation is also identified, which indicates the reliability of the translated Urdu version-I of the scale. The Cronbach's Alpha as mentioned in Table 6.1 was calculated to be 0.965 which was excellent. These results were obtained after the revised version by an expert panel of ten physical therapists. It was seen that translated version of WeeFIM scale is valid and reliable for application.

Reliability of the Urdu version of WeeFIM instrument was assessed when it was applied to the preterm population between the ages of 4 to 7 years. The sample size was 52. The Cronbach's alpha (internal consistency) of the Urdu version-II instrument was assessed after it was applied on the target population.

The scale was found to be reliable as the Cronbach's alpha value was found to be 0.837 compared to 0.99 which was reported in a sample which included a population of 573 non-disabled children[1].

The Pearson co-relation of all the domains were assessed after the application of the Urdu version of the instrument in preterm population, shown in Table 6.4 which was 0.636 for motor, 0.523 for behavioral and 0.754 for cognitive domains. So, the Pearson co-relation 'r' which measures the content validity is good for this scale according to Portney and Watkins criteria. As for the construct validity, the WeeFIM scale in its present form could not satisfy the requirements for Rasch measurement model.

The inter-rater reliability, internal and external construct validity was not identified in this study because this was a

preliminary study, which was considered to be a major limitation of this study.

## CONCLUSION

Urdu version of WeeFIM scale is valid and reliable tool for preterm children.

**Conflict of interest:** Nothing to disclose

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