

Hindi Translation and Evaluation of Psychometric Properties of Functioning Everyday with a Wheelchair (FEW) Tool on Individuals with Spinal Cord Injury: A Pilot Study

Swati Malik*, Jaskirat Kaur**, Majumi M. Noohu***

Abstract

Objective: Functioning Everyday with A Wheelchair (FEW) Tool is a self-report questionnaire to be administered over time to consumers of wheeled mobility and seating technology, as a dynamic indicator or profile of perceived user function related to wheelchair use. The aim of this study was to translate this tool into Hindi language, so as to make it available for use in a population who don't understand English; and to test its content validity and internal consistency in Spinal Cord Injury population.

Methods: The FEW tool was translated into Hindi and made ready for application by a translation committee. The tool was then reviewed by a review committee to check the translations. Then, pilot testing was done, where subject responses and comments were noted. A sample of 15 subjects was recruited for pilot testing. Lastly, the content validity for the tool was determined by a panel of 10 subject matter experts (SMEs).

Results: The CVR for each individual item on the scale was found to have a significant value at $p < 0.05$. The overall content validity of the scale was determined by the CVI (0.89), which was significant. The Internal Consistency Reliability of the tool, calculated at the time of pilot testing was found to have a significant value for the Cronbach's alpha (0.87).

Conclusion: The Hindi translated version of the FEW tool holds content validity and internal consistency for use in subjects using wheelchairs with spinal cord injury.

Keywords: Spinal cord injury; Content validity; Internal consistency reliability; Functioning Everyday with a Wheelchair; Cross cultural adaptation; Environment.

Introduction

The wheelchair is among one of the most important devices used in rehabilitation for mobility. Wheelchairs are used to enhance function, to improve independence, and to enable a person to successfully live at home and in the community. On the other hand, a wheelchair may be perceived as negatively impacting a person's life if it does not enable

him/her to participate fully in social and community activities.[1]

People with spinal cord injury rely on assistive technology, especially their wheelchair, to perform in many of life's activities.[1] Seating and mobility are important considerations for individuals with Spinal Cord Injuries, because the seated position forms the foundation from which they perform the essential activities of daily living, including tasks involving mobility.[2] Approximately 82% of persons with spinal cord injury are dependent on wheelchair for mobility. For many patients with spinal cord injury, a wheelchair is the primary means of locomotion.[3,4]

Little empirical work has been done to assess the effects of wheelchair interventions on consumers. Most literature on wheelchairs is focused around issues of design, consumer

Author Affiliation: *Postgraduate Scholar, ISIC institute of Rehabilitation Sciences, New Delhi, **Assistant Professor, ISIC Institute of Rehabilitation Sciences, New Delhi, ***Assistant Professor, Centre for Physiotherapy and Rehabilitation Sciences, Jamia Millia Islamia, New Delhi

Reprint request: Majumi M. Noohu, Assistant professor, Centre for Physiotherapy and Rehabilitation Sciences, Jamia Millia Islamia, New Delhi-111025.

Email: mnoohu@jmi.ac.in

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preferences, use, disuse, abandonment, cost, and policy. What is not known is how wheelchairs and related factors of a physical disability affect overall participation. Hence, the user's assessment of daily participation as well as wheelchair provision needs to be considered to identify gaps in activity involvement by people with SCI.[1] Emphasis on collecting data from a patient's perspective parallels a shift in theoretical premises in the field of rehabilitative technology, from a medical assessment model to a client-centered perspective. The value of subjective assessments has increasingly been recognized along with the growing awareness of the need for client-centered interventions.[5]

There are a variety of instruments available regarding wheelchair functioning such as Seating Identification Tool (SIT),[6,7] Wheelchair Outcome Measure (WhOM),[7,8] Wheelchair Physical Functional Performance (WFPF),[7,9] Wheelchair User's Functional Assessment (WUFA)[7,9] etc. However, the available instruments do not provide valuable information regarding consumer's self-perceived function with their seating-mobility device. The Functioning Everyday with a Wheelchair (FEW) tool was designed for use by researchers and practitioners to quantify consumer perceived function related to seating-mobility technology.[7]

With a population of one billion and the national language being Hindi, a majority of people speak Hindi in India. Apart from India, there are large numbers of Indians who are settled in various parts of the world and have Hindi as their mother tongue. There isn't any scale available, which deals with the seating and mobility issues for patients of Spinal Cord Injury in the Indian scenario. The FEW is a self administered tool which can be used in India and it can be easier to administer if it is translated into Hindi.

The advantages of translation are that, the translation and adaptation of an instrument is usually less demanding. The cross-cultural differences are dealt with, in the translation process to suit the target population in a different language. The instrument may also

be used for comparison of results between countries.[10] Therefore, the aim of this study was to develop FEW into the Hindi language for availability to a large Hindi speaking population of India and to obtain a conceptual equivalence between the original and translated versions which then allows comparison amongst various international trials.

Methods

A convenience sample of 15 wheelchair users with Spinal Cord Injury was recruited from Indian Spinal Injuries Center, New Delhi. Subjects who met the following criteria such as age 18 years or older,[7] using manual/power wheelchair for at least 2 weeks,[11] patients who are native speakers of Hindi Language, patients with a primary level of education and adequate cognitive status on assessment were included in the study. Subjects with medical conditions which could hamper the use of a wheelchair were excluded from the study. The study was approved by research and ethics committee of ISIC Institute of Rehabilitation Sciences, New Delhi.

The translation of the FEW into Hindi was done by the EORTC manual guidelines.[12] The EORTC manual is an accepted and widely used procedure for translations. The FEW tool was translated into Hindi by a Translation Committee, which comprised of five translators working for the Hindi Section, Government of India. Translator 1 and 2 translated the tool into Hindi, translators 3 and 4 back-translated the tool into English. Translator 5 was the coordinator for the whole process, and was involved in both. The forward translation and back translation processes. The scale was then reviewed by a translation Review Committee, which comprised of 2 senior physiotherapists, 2 senior occupational therapists, and 2 peer counselors. The comments and suggestions of the Review Committee were then sent back to the : Translation Committee for corrections in the next intermediate Hindi version of the

scale. After repeating this process thrice, the final translated copy was then ready to be sent for pilot testing.

In the pilot testing phase, the Hindi translated version of the FEW tool was administered to a sample of 15 spinal cord injury patients. The scores of the administered tool were retained for calculating the internal consistency of the tool. Apart from this, an interview was conducted to find out the problems with the Hindi translated version of the FEW tool. The suggestions were incorporated in the final translated Hindi version of the FEW tool and the scale was sent for content validity.

The scale was reviewed by the rehabilitation professionals to determine the face validity. Content validity was determined by calculating the Content Validity Ratio (CVR).[13] It determined, if the skill or knowledge measured by this item was:

- Essential (score = 1)
- Useful, but not essential (score = 0)
- Not necessary (score = -1)

The Quantification was done according to the formula:

Where n_e is the number of subject matter experts (SME) indicating 'essential' and N is

$$CVR = \frac{n_e - N/2}{N/2}$$

the total number of SMEs. Responses for all items were pooled and the number indicating 'essential' for each item was determined. The CVR is an item statistic that is useful in the rejection or retention of specific items. After the items had been identified for inclusion in the final form, the Content Validity Index (CVI) was simply calculated as the mean of the CVR values of the retained items.

Internal Consistency Reliability was determined by calculating the Cronbach's Alpha by the formula[14]

k = number of separately scored test items

$$\text{Coefficient } \alpha = \frac{k}{k-1} \left[1 - \frac{\sum s_i^2}{s_t^2} \right]$$

$\sum s_i^2$ = sum of the item variances for all test

items

s_t^2 = variance of the total test scores

Data Analysis

Statistical Package for Social Sciences (SPSS) for Windows version 16 was used for the data analysis. Mean age of participants was calculated using descriptive analysis. Content Validity was calculated using the Content Validity Ratio formula. Content Validity Index was calculated by taking out a mean of the values of the individual CVRs of each item. Reliability analysis was done for internal consistency of the Functioning Everyday with a Wheelchair (FEW) Hindi version by calculating the Cronbach's Alpha value.

Results

The demographic details of the subjects (n=15) who participated in the study is tabulated in Table 1. The mean (S.D.) of individual items of Hindi translated version of the FEW Tool is tabulated in Table 2 to

Table 1: Demographic Details of the Sample (N=15)

Variables	N = 15	
Age (in yrs.) (Mean ± SD)	27.53 ± 6.79	
Time since injury (in months) (Mean ± SD)	887 ± 851	
Time since same wheel chair (in months) (Mean ± SD)	473 ± 510	
Gender (Male/ Female)	13/ 2	
Type of wheel chair	Active	2
	Semi Active	6
	Passive	7
Type of Injury	Quadriplegia	4
	Paraplegia	11

Table 2: Mean and S.D. of Individual Items of Hindi Translated Version of FEW Tool

S. No.	Item Number (N)	Mean ± S.D.
1	1	3.93 ± 1.71
2	2	4.27 ± 1.22
3	3	4.33 ± 1.50
4	4	3.73 ± 1.53
5	5	2.73 ± 1.94
6	6	3.47 ± 1.84
7	7	2.53 ± 2.29
8	8	4.47 ± 1.64
9	9	3.27 ± 2.05
10	10	1.93 ± 1.79

Table 3: Content validity for the Hindi translated version of the FEW tool

S. N.	Item Number (N)	CVR
1	1	.99*
2	2	.99*
3	3	.80*
4	4	.80*
5	5	.80*
6	6	.99*
7	7	.99*
8	8	.99*
9	9	.80*
10	10	.80*
11	CVI	.89*

determine Internal Consistency Reliability. The mean score of the ten items on the tool was 3.67 with a S.D. of ± 12.09 (Table 2).

The Content Validity Ratio (CVR) at $p < 0.05$, for each item of Hindi translated version of the FEW Tool is given in Table 3. CVI was calculated as a mean of the CVR values of the 10 items of the tool. The content Validity Index (CVI for the tool was found to be 0.89 (Table 3). The value of Cronbach's alpha for the Hindi translated version of the FEW tool was found to be 0.87 (internal consistency reliability).

Discussion

The Functioning Everyday with a Wheelchair (FEW) tool measures functional performance of seating-mobility users at a single point in time and, if administered repeatedly, over a period of time. Utilization of the FEW instrument throughout the service delivery of seating-mobility technology may facilitate practitioner-client interaction by promoting discussion of consumers' current and future skills, goals, preferences, and environmental contexts.

Translation Process

Stage I

Step 1: Forward Translation

The aim of this first step was to translate the FEW into Hindi and produce a version that would be conceptually as close as possible to the original questionnaire, using culturally and clinically appropriate expressions. The English

questionnaire was given to two translators. Translator 1 was an English-Hindi-English translator working for the Hindi Section, Govt. of India. He has 24 years experience in the field of translations. Translator 2 was an English-Hindi-English translator working for the Hindi Section, GOI. He has 5 years experience in the field of translations. Translator 5 was the moderator for the entire process. He has 21 years experience in the field of translations. All three translators have Hindi as their native language and have a very good command over English. The first two translators independently translated the FEW. The linguistic register of the questionnaire was equated to that of a person of 12-14 years of age, which led to excluding, as far as possible, technical terms or over sophisticated, pedantic or formal words or phrases. Wherever there were discrepancies between the two, the points were personally discussed between the translators and moderator of the translation committee.

In stage I during forward translation some of the items with discrepancies were as follows. For the title, translator 1 put the heading as 'वील चेयर उपकरण' (wheelchair upkaran), which means 'wheelchair tool', whereas it originally is Functioning Everyday with the Wheelchair tool. Translator 2 put the heading correctly, but the word रोजमर्रा (roz-marrah) was difficult to understand according to the prescribed linguistic register. Agreement could not be reached and thus, the moderator used the word हर रोज in its place, giving alternating wording to be resolved in back translation. For the phrase 'Directions to Client', the word 'directions' was translated as निर्देश (nirdesh) by translator 1 and हिदायत (hidayatein) by translator 2. Agreement was reached to use the word निर्देश (nirdesh), as it is the closest translation for the word direction. The sentence formation for the directions was followed as per the translation of translator 1, as it was simpler and easier to perceive and it also matched with the sentence formation of the original English version. Options were seen with the words यदि (yadi) by translator 1 and अगर (agar) by translator 2. The version

by translator 2 was used as it was more frequently used in spoken language and easily understood by the patient. Similarly for the scores provided in the beginning, words such as पूर्णतः सहमत (purnateh sehmat) by translator 2 were not used. Instead पूरी तरह से सहमत (puri tarah se sehmat) would be easily understood and was thus used for the intermediate version. For item 1, the sentence formation of translator 2 was accepted by the translators and the moderator, as its language matched best with the original version. For item 2, the language of translator 2 was taken, but the word मेल खाती है (mel khati hai) was used instead of अनुरूप है (anuroop hai) for its ease of understanding.

Item 3-5 had words उपयुक्ता (upyukta-ta) and फिट (fit). Both were used for the word 'fit'. The word फिट (fit) by translator 1 was accepted for the problem to be resolved in back translation. The rest of the language was kept the same as used by translator 2. Item 6 has the word 'transfer', which is an activity. It is a noun for which no suitable Hindi word could be found. Thus the word 'transfer' was retained in the Hindi version, as it has a clinical significance for the target population. In item 7, the word निजी (niji) was used by Translator 1, and स्वयं (swayam) was used by translator 2. The word स्वयं (swayam) is difficult to understand in spoken Hindi and hence, the version by translator 1 was taken. For the rest of the sentence formation, translator 2's wording was accepted. For items 8-10, language for sentence formation and ease of understanding was taken by translator 2. The word उपयुक्ता (upyukta-ta) was replaced by फिट (fit).

By the above process, an intermediate Hindi version was prepared with the agreement of the two translators on all the items and minor additions by the moderator. The intermediate version was then ready to go for back translation.

Step 2: Back Translation

Two independent translators, who were unfamiliar with the original English version, back translated the intermediate Hindi version into English. Translator 3 was an English-Hindi-English translator working for the Hindi Section, Govt. of India. He has 24 years experience in the field of translations. Translator 4 was an English-Hindi-English translator working for the Hindi Section, GOI. The two translators independently back-translated the intermediate Hindi version of the FEW into English; without any reference to the original English version.

The problems encountered in the back-translations were as follows. The voice of item 1 is passive in both the versions, whereas that of the original version is active. Translator 3 translated the word कुशलता (kushalta) as 'skillfully', while translator 4 translated it as 'efficiently'. In item 4, the word 'operate' was back translated as 'handle'. In item 5, the words 'different surface heights' was back-translated as 'elevated and depressed surfaces'. The words 'it's functioning' were used instead of the wheelchair. The word indoor was translated as 'घर के अंदर (ghar ke andar) and outdoor was translated as 'घर के बाहर (ghar ke bahar), which when back translated, came out as 'premises'.

The translated and back translated versions along with the original English version were presented in front of a multi-disciplinary committee, which comprised of 2 physiotherapists, 2 occupational therapists, 2 peer counselors and a rehabilitation psychologist. They reviewed the tool and suggested the remedial steps to be taken for further translations of the scale into Hindi.

The committee found the word मजबूती (mazbooti) to not match with the English version. मजबूती (mazbooti) meant 'strength', whereas the word in the original version was 'stability'. In item 4, the word 'operate' was written as चला पा रहा हू (chala pa raha hu), and back translated as 'handle', thus, the

committee members suggested that the wording for the phrase should be changed. Also, in items 4 through 10, the end phrase was कर पा रहा हूँ (kar pa raha hu), which meant 'I am able to do' and not 'allows me'. Hence the committee members suggested that rephrasing of the language should be done. Another change suggested by one committee member was for the word 'indoors', which was translated as घर (ghar). Changes were made so that, the word included a broader meaning and included indoor places apart from the patient's house.

Stage II

Step 1: Forward Translation

In the second stage of the translation process, the word 'शरीर' (shareer) was replaced by 'आसन' (aasan), as it best matches the word posture when back translated into English. The voice of the question was changed to match the active voice of the original version. The word घर (ghar) was changed to the word 'परिसर' (parisar). This was done, as the word घर (ghar) was limiting the patient's ability to roam around only with respect to the home. The word 'परिसर' (parisar) was used instead. The phrase 'कर पा रहा हूँ' (kar pa raha hu) was rephrased as 'कर पाने में सहायक है' (kar pane me sahayak hai). The wording of item number 5 was changed to match the patient's ability to specifically reach on different heights, and carry out the tasks.

Step 2: Back Translation

The word 'आसन' (aasan) back translated as posture, matching the original wording. The word 'परिसर' (parisar), although back translated as complex/ compound, but best matched the meaning of the question in Hindi, and was found to be better suited than the word घर (ghar) by the expert panel. The phrase 'कर पाने में सहायक है' (kar pane me sahayak hai), back translated as "helps me to", which was found not to match with the original version, which said 'allows me to'.

The back translation of the item no. 5 did not come out similar to the original version.

The original version stated that 'the ability to reach and carry out' was together. But in the back translated version, the words 'reach' and 'carry out' were coming out separately and were found to change the meaning of the questionnaire. The word 'चलायमान' (chalaymaan) when back translated meant 'mobile or movable', and not 'mobility'.

The committee recommended the following changes at this stage. Firstly, they accepted the word 'परिसर' (parisar), as it better matched the ability to explain the meaning of the word 'indoors' in the original version. Secondly, they suggested changes for the phrase 'कर पाने में सहायक है' (kar pane me sahayak hai), because it did not mean 'allows me to', as in the original version. Thirdly, they suggested changes in the phrasing for item number 5, because the two items 'reach' and 'carry out' were coming out as separate items in the Hindi translated version and not as a single unit as in the original version. Lastly, they suggested that the word 'चलायमान' (chalaymaan) be changed, as it back translated as 'movable', and not 'mobility'.

The changes suggested by the committee members were then incorporated into the next stage of the translation process, to form the third intermediate copy of the scale.

Stage 3

Step 1: Forward Translation

The word 'सहायक' (sahayak) was changed to 'अनुमति' (anumati) to match the original wording. The language of item number 5 was rephrased to suit the questionnaire's original version. The word 'चलायमान' (chalaymaan) was changed to 'गतिशील' (gatisheelta). The phrasing of the instructions was done according to the suggestions given by the expert committee.

Step 2: Back translation

The word अनुमति (anumati) back translated as 'allowing', which matched the original version. The back translation of item number

5 matched the original version in its content. The word 'गतिशीलता' (gatisheelta) came out as 'mobility' and the error was corrected.

As the back translated version of the third intermediate Hindi version of the scale came out to match the original English version, and was without any more errors, it was accepted by the translation review committee as the final version. (Appendix 1)

The Hindi version of the tool was administered on 15 spinal cord injury patients for pilot testing, who had been randomly selected on the basis of the inclusion criteria stated in the methodology. After the administration of the scale, a structured interview was administered to the patients to determine whether the wording used made any of the translation items difficult to answer, confusing, difficult to understand, upsetting or offensive and/or, whether the patient would have asked the question in a different way.

The problems encountered during the scale administration were, that some patients found the word स्थिरता (sthirta) (stability) in question number 1 difficult to understand. The word संचालित (sanchalit) (operate) in question number 4 was difficult for most of the patients. Some patients also reported that they could not comprehend the exact meaning of the word 'परिसर' (parisar). The language of question number 1 was confusing for some patients and 1 patient could not understand the meaning of the word रोज़मर्रा (roz-marrah). The meaning phrase विभिन्न सतह ऊचाईयों (vibhinna satah uchaiyan) was not clear.

On the basis of this interview, the provisional translation required adaptation to incorporate the changes suggested by the pilot population. The tool was then taken back to the translation committee for providing alternating wording. The necessary changes were incorporated and the final version of the scale was thus prepared. The scale was reviewed by rehabilitation professionals and face validity was established. After the translation and pilot testing phase, the scale was ready for the determination of the content

validity of the scale. A quantitative review were conducted to determine content validity. During the quantitative review of the tool, none of the items on the scale were rated as 'not essential' by the reviewers. Items 3, 4, 5, 9 and 10 were each rated as 'useful, but not essential' by the reviewers. The content validity ratios indicated good content validity of the scale. The Internal Consistency Reliability of the tool, calculated at the time of pilot testing was found to have a significant value for the Cronbach's alpha.

The development of the Hindi translated version of the FEW would help the physical therapist to measure the perceived user function related to wheelchair use in people with SCI. The development of the scale in Hindi ensures that the common man would be easily able to understand and comprehend the tool. The Hindi translated version of the FEW can also be used to make international comparisons and cross cultural research studies. Clinically, having standardized assessments available in Hindi will assist the clinicians in providing culturally sensitive assessments to clients who do not understand English.

Further studies can be done to determine other psychometric properties of the scale. The Hindi translated version of the FEW tool can be used in clinical practice in the future to check the efficacy of the user perceived function with a wheelchair and to follow up with patients and with different clinical and environmental conditions.

Conclusion

The Hindi translated version of the functioning everyday with a wheelchair (FEW) tool, has been found to have adequate content validity and good internal consistency on spinal cord injury subjects using wheelchairs, so this tool can be used to assess the user perceived functions related to wheelchair use in spinal cord injury subjects.

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