ORIGINAL ARTICLE
Urdu Translation and Validation of 12- Item Multiple Sclerosis Walking Scale

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ABSTRACT

Background: The MSWS-12 is a useful patient based tool for testing gait in people with MS. It accounts for patient's own perspective that how their disease has affected their gait. It has been cross-culturally adapted and validated in 51 languages as Italian, Brazilian, Turkish, Korean and Persian.

Aim: To adapt and translate MSWS-12 in Urdu language and to check the validity and reliability of resultant Urdu version on group of MS patients.

Methodology: The Study was conducted in two phases. First phase included its translation in Urdu language which was done according to Beaten et al Criteria. Which includes 5 main steps as forward translation, translation consolidation, backward translation, review by the committee and application of final version. In second phase validity and reliability was assessed. The study included patients with MS between age of 20-50 years who can read and understand Urdu language.

Results: The current Urdu version of MSWS-12 demonstrated great compatibility with the original English version. The MSWS-12-U showed excellent reliability and validity, having ICC value 0.979, while Cronbach's alpha value of 0.90 and 0.979 for test and retest respectively. For validity, CVI score for MSWS-12-U was 0.91. MSWS-12-U showed excellent correlation with TUG having R-value and Rho values of 0.950 and 0.935 respectively. Factor analysis showed that total and commutative variance was 87.665%.

Practical implication: The Urdu version of MSWS-12 will help medical professionals including physical therapist to collect the data more accurately so that they can evaluate patient reported walking difficulties in MS patients.

Conclusion: The study concluded that MSWS-12-U is highly reliable and a valid tool.

Key words: Multiple Sclerosis,Walking impairments, MSWS-12, walking assessment

INTRODUCTION

Multiple Sclerosis (MS) is characterized as an inflammatory disease that primarily causes disruption of myelin sheath and affects multiple systems of body as neurological, musculoskeletal , motor and cognitive systems[1]. MS has a wide range of symptoms and is most commonly diagnosed in people between the age of 20-50 years, characterized by multiple neurological deficit and reduced QOL[2,3,4].

MS is more common in women as compared to men[5,6]. According to a thorough analysis of epidemiological research, the estimated female to male MS incidence ratio has grown from 1.4:1 to 2.3:1.MS has a wide regional spread in terms of incidence and prevalence[7].

According to the incidence of MS, Kurtzke identified three geographical zones: (a) high prevalence >30/100,000, (b) moderate prevalence 5-25/100,000, and (c) low prevalence 5/100,000. The majority of the high and medium risk locations are populated by white people. South Asia has long been thought to be a low-prevalence region[8]. However, recent studies have revealed that the frequency of this disease is growing in this area as well[9]. MS has no longer been a rare disease in Pakistan. MS in Pakistan has moderate prevalence and is estimated in about 10/100,000 people in Pakistan. According to data, the majority of MS symptoms in Pakistan are comparable to those in the West[10].

Apart from other common symptoms as Muscular stiffness, weakness and spasms, myalgia, optic neuritis, ataxic gait, painful sensations, tremors, numbness, paraesthesia, bladder and bowel dysfunction, and psychological issues[5,11] walking is greatly affected by course of the disease which on other hand has a substantial influence on a person's functional independence and quality of life. It has been reported that 80-85% of individuals with MS report gait impairment as a major complaint, and more than a 1/3 are unable to walk as the disease progresses[12,13] which is one of the most common concerns among MS patients with the passage of time[13].

Different tools have been designed and included in clinical trials to evaluate gait impairments faced by MS patients some of them are Time Up and Go Test (TUG) which measures the time taken to cover a specific distance, Timed 25-Foot Walk test, 6 Minute walk test[14]. The development of MSWS-12 has been beneficial in studying walking impairments according to PRO. MSWS-12 has been tested extensively for its validity and reliability[15] and has been used as a criterion in rehabilitation studies as outcome tool[16,17].

This Scales is used to rate impact of MS on patient's walking ability, Running, climbing stairs, maintaining balance during standing and walking, and assistance they needed to walk in last two weeks. The scores are ranked from 1 (not at all) to 5 (extremely difficult) and a total score is obtained. High scores indicates increased gait impairment in patients[11]. This scale has been translated in many version including Swedish Brazilian1[8], Brazilian Portuguese[19], Italian[4] and Dutch[20] languages.

MSWS-12 has been translated in 51 languages as Italian. Brazilian, Brazilian Portuguese, Turkish, Korean and Persian. However up till now there is no valid Urdu version of MSWS-12 available. So the main purpose of this research was to adapt and translate MSWS-12 in Urdu language so that it would be easy for the patients to report about their walking impairments and to check the validity and reliability of resultant Urdu version on group of MS patients.

The translated version of MSWS-12 will help clinicians of Pakistan to collect the data more accurately so that they can evaluate patient reported walking difficulties in MS patients. This significance of the study is to make a valid and reliable Urdu version of MSWS-12.

MATERIALS AND METHODS

This cross-sectional study was conducted after the approval of Riphah international university and the author of MSWS-12 from September 2021 to September 2022. The study was conducted in two phases. In phase one original MSWS-12 was translated in Urdu

language and in phase two, Validity and reliability of the resultant Urdu version was assessed.

Translation process: The whole process of translation was based upon Beaton et al (21) guidelines for cross-cultural adaptation of tool which involves five different stages.

Forward Translation: The most initial step is forward translation in which two bilingual translators having Urdu as their native language were chosen. Both the translators then translated the tool in Urdu language (MSWS-12-T1 and MSWS-12-T2)

Translation Consolidation: After the individual translations, both the translators discussed their translated tools with each other and formed a unified translated version of MSWS-12 tool (T-12).

Backward Translation: Again two translators were chosen who translated back the unified translated version T-12 in English language (BT1 and BT2) both of them belonged to a non-medical background but had English as their First language.

Expert Committee: Then a panel of Expert committee was formed including methodologists, health professionals, language professionals, translators, and researchers, who reviewed the forward translated version of MSWS-12.

Pre-testing the final version: A sample 0f 10 individuals was selected and their demographic data was taken. Then they were asked or fill the questionnaire and after that an interview was conducted to assess whether the patient grasped the meaning of the question or if they faced any difficulty in understanding the question.

Final Version: After all the necessary changes suggested by the panel and through patient interviews, a final Urdu and English version of MSWS-12 was made. Afterwards data collection was started on MS (n=20) by using MSWS-12-U

Participants and data collection: In this Cross-sectional study convenient sampling technique was used and the Participants for the main study were recruited from different hospitals of Lahore, Faisalabad and Sahiwal, namely Life Line Health Care Lahore, Allied Hospital Faisalabad, DHQ Sahiwal, Alkhidmat hospital Sahiwal and Midcity hospital Sahiwal.

The participants were included according to following inclusion criteria: age 20-50 years (2), clinically diagnosed patients with MS Patient of both genders, who were able to walk even with assistive devices and those who can read and understand Urdu language.

While the participants were excluded according to following criteria: Those suffering from any other neurological disease, those who had experienced a relapse 30 days' prior, Unconscious patients and Patients having walking impairment due to any other musculoskeletal issues

Data analysis procedure

- All the data was analyzed by using SPSS Version 26
- Frequencies and percentages were calculated for all the continuous variables
- Reliability was assessed using Cronbach's Alpha and Intraclass correlation coefficient. For Cronbach's Alpha, following scoring was taken.
  - ❖ 0.50-0.69 = poor
  - ❖ 0.70-0.79 = acceptable
  - ❖ 0.80-0.8= good
  - ❖ 0.90 = excellent
- Convergent validity between MSWS-12 and TUG was evaluated by using Pearson's coefficient value and level of significance. R-value > 0.7 - 1 showed good correlation and P-value < 0.05 was considered significant.
- Content Validity Index (CVI) and Content Validity Ratio (CVR) was used to assess content validity of MSWS-12-U

RESULTS

PHASE 1 TRANSLATION OF MSWS-12

Forward translation: Initially MSWS-12 was translated by two translators and a final version was created which was then evaluated by the panel of health care professionals. Some minor

changes were suggested by them and almost all the professionals asked to revise the translation of question number 4, 5, 6 and 7

Backward Translation: After the final Urdu version was created, two translators then translated back the MSWS-12-U in English language and a final English version was formed which was then assessed by panels and no changes were advised by the panel.

Demographics: The mean age and standard deviation of participants was 37.50 ±5.052, and the minimum age of participant was 29 years while maximum age was 47 years. While out of 20 MS patients 6 (30%) were male while 14(70%) were females (Table 1)

Table 1 Patient's demographic data

	n	%age
Male	6	30%
Female	14	70%
Age	37.50 ±5.052 **Min :** 29 years **Max :** 47 years	

Table 2 Validity ratio (CVR) and Content Validity Index (CVI) of MSWS-12-U

Item No.	Description	CVR
1	آپ کے چلنے کی صلاحیت کو محدود کیا	1
2	آپ کے دوڑنے کی صلاحیت کو محدود کیا	1
3	آپ کی سیڑھیاں اترنے اور چڑھنے کی صلاحیت کو محدود کیا	1
4	آپ کے لیے کھڑے ہو کر کام کرنے کو مشکل کیا	0.8
5	کھڑے ہونے یا چلنے پھرنے میں آپ کے توازن کو متاثرکیا	0.9
6	آپ کے دور تک چلنے پھرنے کے صلاحیت کو محدود کیا	0.9
7	آپ کے چلنے کے لیے دکار کوشش میں اضافہ کیا	0.6
8	آپ نے گھر کے اندر چلنے پھرنے کے لیے چھڑی یا فرنیچر کا سہارا لیا	1
9	آپ نے گھر کے اندر چلنے پھرنے کے لیے چھڑی یا فرنیچر کا سہارا لیا	1
10	آپ کی رفتار کو کم کیا۔	1
11	آپ کے ہموار چلنے پھرنے کو متاثر کیا۔	0.9
12	آپ نے اپنی توجہ چلنے پھرنے پر مرکوز کی۔	0.9
	Content Validity Index (CVI)	**0.91**

Table 3 Pilot study Groups

Gender	N	MEAN	SD
Total Reading Healthy Participants			
Male	2	20.00	00
Female	3	20.00	00
Total Reading MS patients			
Male	2	46.50	19.092
Female	3	79.67	9.866

Table 4 Intraclass correlation Value

Reliability Statistics			
	Cronbach's Alpha TEST	Cronbach's Alpha RETEST	ICC
MSWS-12 U	.980	.979	.979

Table 5 Correlation between MSWS-12-U and TUG

R-value	Spearman's ρ	P-Value
0.950	0.929	0.000

Phase 1 validity and reliability

Validity: The content validity ratio for each question and Content validity index is summarized in Table No 2. The CVR for each question was above 0.8 except question number 7 whose CVR was 0.67. Hence the CVI calculated was 0.91. (Table 2)

Pilot study results: For pilot study the sample size was 10 (5 healthy population and 5 MS patients) and both the groups were asked to fill MSWS-12-U. After that total score was calculated for each group. In PwMS, the mean difference and SD of the total MSWS-12-U score was 46.50 ± 19.092 for males and 79.67 ± 9.866 for females. While in healthy population the results were 20.00 ±0.00 for both males and females. The result signifies that MSWS-12 is only valid for Multiple Sclerosis patients. (Table 3)

Test-retest Reliability and Internal Consistency: For test-retest reliability Cronbach's Alpha was calculated and the value near to 1 was taken as significant. For Test the value of Cronbach's Alpha was 0.980. For retest, which was taken after 24hrs, the value of

Cronbach's Alpha was 0.979. The average ICC value obtained was 0.979 which shows good test re test reliability (Table 4).

Convergent Validity: MSWS-12 was correlated with TUG for Convergent validity. Table 5 shows the r- value, Spearman Rho value and p-value for correlation. R-value was obtained was 0.950 which shows good correlation, ρ-value was 0.935 while p value was 0.000 which means it is highly significant. The results showed MSWS-12-U has a good convergent validity (Table 5).

DISCUSSION

The main purpose of the current study was to translate the 12-Item multiple sclerosis scale in to Urdu language and to analyze its reliability and validity in Pakistani MS patients. The results of the current study concluded that MSWS-12-U is reliable and valid tool to be used for MS patients in Pakistan. The validity was analyzed by using 5-point LIKERT scale and TASP table.

The Persian version of MSWS-12 also demonstrated good reliability and validity in MS patients. All the healthy and MS patients responded to all the items in scale and there was no missing data which showed good face validity. The α-value was 0.96 and 0.97 for test and retest respectively which demonstrated good internal consistency, ICC value was 0.98 which showed high reliability while factor analysis showed total variance of 79.24%[11]. The following results are coherent with the present studies which also showed good reliability and validity for MSWS-12-U having CVI 0.91 and ICC value of 0.979.

Bennett el all measured validity and reliability of four clinical measures used for PwMS which include TUG, MSWS, EDSS and T25FW. They concluded that all the four items were strongly correlated having p -value >0.01. However, among all four items EDSS was strongly correlated with MSWS-12 having ρ- value of 0.788. The Results also showed that TUG and MSWS-12 also had an excellent correlation having ρ-value of 0.806. ICC of MSWS-12 was 0.836[22]. As per the results of present study, MSWS-12 has a strong correlation with TUG having ρ-value of 0.935 and ICC for MSWS-12 was 0.979. According to one study translated the MSWS-12 in Brazilian language. They concluded that Brazilian version of MSWS-12 is reliable and a valid tool and demonstrated good internal consistency having ICC value of 0.865 (0.78-0.92) and Cronbach's α-value of 0.943 and 0.951 for Reading 1(test) and reading 2 (retest) respectively. They also concluded that MSWS-12/BR was strongly correlated with T25FW and MSIS-29/BR having r value of 0.577 and 0.803 respectively and p-value of 0.000 for both items.(18) the following results are concurrent with present study, which shows α-value of 0.9 and 0.979 for test and retest respectively, while in present study MSWS-12 was compared with TUG and it showed strong correlation having R-value of 0.950 and p-value of 0.000.

Korean version of MSWS-12 also showed good reliability and validity in MS patients having IIC values for test was 0.732 and for 0.955 for retest. While the α-value for all items of MSWS-12 was 0.976 and 0.972 for test and retest respectively, which showed an excellent internal consistency for 12-item Multiple sclerosis scale. The Intraclass correlation coefficient value was 0.910[23]. As per current study, IIC values for both test and retest ranged from 0.7-1 while ICC value was 0.979 and α-value was 0.90 and 0.979 for test and retest respectively. Hence both results concluded that MSWS-12 is a valid and a reliable tool.

Sebastião et al in 2014 assessed the validity of Timed up and go test with MSWS-12 in Multiple sclerosis patients. The results showed that TUG is highly correlated with MSWS-12 having ρ-value of 0.80[24]. while present study also demonstrated strong correlation between MSWS-12-U and TUG with ρ-value of 0.935.

As apart from Urdu, number of languages are spoken in Pakistan as Pastho, Punjabi, Sindhi etc, so it is recommended that MSWS-12 should be translated in different languages which would enhance its generalizability to small population.

CONCLUSION

The study concluded that present Urdu version of 12-item Multiple Sclerosis Scale (MSWS-12-U) demonstrated great compatibility with primary English version of MSWS-12. The study demonstrated that MSWS-12-U is highly reliable and a valid tool having an overall great Face Validity, Content validity, Construct Validity and Test-retest reliability.

Conflict of interest: Nil
Conflict of interest: None declared

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