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Original Article

Physiotherapy Section

Validation of Gujarati Translated Version of Stroke Impact Scale

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ABSTRACT

Introduction: Stroke Impact Scale (SIS) is an outcome measure for assessment of quality of life in post stroke patients. SIS version 3.0 and SIS-16 has been translated by MAPI Research Institute into various languages like Turkish, Spanish etc. The need to translate a questionnaire is apparent if the target population is known to be of different language from source questionnaire.

Aim: To validate the Gujarati translation of SIS version 3.0 and SIS 16 for clinical and research work.

Materials and Methods: SIS version 3.0 and SIS 16 were translated into Gujarati from English using Forward-Backward-Forward method. To ensure the face and content validity using group consensus method, each item was examined by group of experts having mean experience of 11.78 years in the field of neuro rehabilitation. Each item was analysed for content, meaning, wording, format, ease of administration and scoring. Each item was scored by expert group as either accepted, rejected or accepted with modifications. Procedure was continued until 80% of consensus for all items. Concurrent validity was examined on 26 chronic stroke survivors with mean age 55.23±12.47 (35-74 years) by correlating different domains of SIS with domains of suitable standardized tests.

Results: Out of 8 domains and 59 items spread across the domains, 48 items were accepted with >80% consensus in phase 1. Total 9 items were modified in phase 2 as per suggestions given by experts with no change in meaning of original English item. Pearson's and spearman's correlation coefficients were used to assess the strength of association between the measures. Moderate positive correlations were found for Memory, Communication, Activities of Daily Living, Mobility and Hand function domains of SIS while weak positive correlation was found for participation and physical domains of SIS 3.0.

Conclusion: Gujarati translated version of SIS 3.0 and SIS 16 is a valid tool to be used in clinical practice for quality of life of chronic stroke patients.

Keywords: Health, Language, Psychometric properties

INTRODUCTION

The World Health Organization (WHO) clinically defines stroke as the rapid development of clinical signs and symptoms of focal neurological disturbance lasting for more than 24 hours or leading to death, with no apparent cause other than vascular origin [1]. In 2015, stroke was the second most frequent cause of death after coronary artery disease accounting for 6.3 million deaths [2]. The overall prevalence of stroke is higher among Asians and in India it is about 250-300/10,000 populations per year [3]. The estimated adjusted prevalence rate of stroke ranges from 84-262/100000 in rural to 334-424/100000 in urban areas. The incidence rate is 119-145/100000 based on the recent population based studies [4].

Quality Of Life (QOL) decreases, even among those who have no post stroke disability [5].

Multiple risk factors including age [6,7], gender [8], dependency in Activities of Daily Living (ADL)/disability [7], social support [9], depression [7,8,10] have been associated with poorer Health Related QOL in stroke survivors.

SIS is an instrument to measure QOL in post stroke patients. Development of the SIS was based on a study at the Landon Center on Aging, University of Kansas Medical Center [11].

SIS version 2.0 [12], SIS version 3.0 [13] and SIS -16 [13] are various modifications done in original SIS.

SIS version 3.0 is composed of 59 items investigating 8 domains like Strength, Memory, Emotion, Communication, ADL, Mobility, Hand function, Social Participation. Each domain contains different number of items ranging 4-10. Low total score indicates high impact on QOL of stroke survivors.

SIS version 3.0 and SIS-16 has been translated by MAPI Research Institute into various languages like Turkish, Spanish, Dutch etc., [14].

Very few instruments for stroke are translated and validated in Indian languages e.g., Hindi and Kannada translated version of Stroke-Aphasia Quality of Life (SAQOL-39) [15,16], Punjabi translated version of Hospital Anxiety and Depression Scale [17] Gujarati translation of MMSE [18].

Current study is a part of larger study titled "Factors affecting stroke outcome" at Ahmedabad, Gujarat where QOL of post stroke patients are to be studied by authors. SIS version 3.0 and SIS 16 patient and proxy version are self- administered questionnaire. There are language barriers and cultural differences in few questions with reference to its applicability at local center which was faced by authors during data collection hence, current study was conducted to translate and validate the SIS into local Gujarati language.

MATERIALS AND METHODS

A cross-sectional observational (methodological study) was conducted at adult neuro rehabilitation department of SBB college of Physiotherapy, Ahmedabad, Gujarat, India after approval from Institutional Ethics Committee with reference no. PTC/IEC/22/2015-16.

Permission was obtained from MAPI Research Institute to translate SIS version 3.0 and SIS 16 patient and proxy version into Gujarati language. Linguistic Validation was done using Forward-Backward-Forward method.

To ensure face and content validity of Gujarati version using group consensus method, each item was examined by group of experts (n=7) with mean experience 11.78 years. The experts were neurologist (n=2), physical therapists working in neuro rehabilitation (n=4), nurse in Neurology ward (n=1).

For concurrent validity informed written consent was obtained from patients suffering from stroke or their primary caregivers (if patient was not able to sign).

After Linguistic validation, each professional was contacted personally by primary author for their expert opinion as phase 1 validation. Each item was analysed by professionals for content, meaning, wording, format, ease of administration and scoring. Each item was scored as either accepted, rejected or accepted with modification. Coded responses were then given to secondary author for analysis. Consensus was defined as agreement with a question by at least 80% of participant [19]. Procedure was continued until 80% of consensus for all items. Items which were not accepted even with modifications (< 80% consensus) in phase 1 of validation, went for phase 2 validation.

Concurrent validity describes how well questionnaire correlates with an existing gold standard measure [20], and it was assessed by comparing final score of each domain with respected domain of gold standard outcome measures like National Institutes of Health Stroke Scale (NIHSS), Mini Mental State Examination (MMSE), Functional Independence Measure (FIM), Stroke Rehabilitation Assessment of Movement (STREAM).

As the present study was part of a larger (yet unpublished) study, 26 subjects suffering from chronic hemiparesis of either haemorrhagic or ischemic type with mean age 55.23±12.47 years (35-74 years) were selected from the adult neuro rehabilition OPD of SBB College of Physiotherapy, between January to March 2017. Patients were excluded if they had severe perceptual or cognitive issues MMSE <24/30. Gujarati translated SIS questionnaire was filled by the patients and other outcome measures were tested by the therapist.

STATISTICAL ANALYSIS

Data were analysed with use of SPSS version 16.0 with level of significance kept at 5%. Pearson's and spearman's correlation coefficients were used to assess the strength of association between the measures.

RESULTS

Face and Content Validity: Out of 8 domains and 59 items spread across the domains, 48 items were accepted with >80% consensus in phase 1. Total 9 items were modified in phase 2 as per suggestions given by experts with no change in meaning of original English item. 2 items required rigorous conceptualization regarding its applicability in adult stroke survivors with reference to Indian context. In phase 2, meeting was arranged for all participants where it was decided not to change overall categorization of item numbers. The statement of question was to write alphabets or to translate it into Gujarati "varnamala". After the discussion it was decided not to modify it but to rewrite English alphabets into Gujarati only.

In item 5a (cut your food with a knife and fork), as per Indian food and habits, 3 options were added: cutting chapatti, making morsel/bite and eating with spoon. Similarly, in item no. 6 g (climb one flight of stairs), approximately 12 steps were added as further explanation of the statement. Revised draft was given to 10 chronic stroke patients for patient testing.

Age (years)	55.23±12.47
Post stroke duration (months)	28.5±32.53
Gender-Male/Female	5/21 (19.23/80.76)
Dominance-Rt/Lt	24/2 (92.30/7.69)
Side of Hemiparesis-Rt/Lt	10/16 (38.46/61.53)
Type of stroke-Ischemic/Haemorrhagic	22/4 (84.61/15.38)

[Table/Fig-1]: Demographic details of patients.

Concurrent Validity: Concurrent validity was tested on 26 subjects suffering from chronic stroke with mean age 55.23±12.47 years and mean post stroke duration 28.5 months. [Table/Fig-1] shows demographic details of studied population (n=26).

SIS Domain Number	SIS Domain Name	Comparative Measure	Spearman's Correlation	Interpretation
1	Strength	NIHSS Motor	-0.254 (p=0.211)	Weak negative – nonsignificant
2	Memory	MMSE	0.384 (p=0.053)	Moderate positive – significant
3	Emotion	Not tested		
4	Communication	NIHSS communication FIM communication	0.559 (p=0.003)	Moderate positive highly significant
5	ADL	FIM Motor (Locomotion + Mobility)	0.323 (p=0.107)	Moderate positive nonsignificant
6	Mobility	FIM Motor STREAM Basic Mobility Gait speed	0.537 (p=0.005) 0.646 (p=0.000) 0.273 (0.177)	Moderate positive highly significant Moderate positive highly significant Weak positive nonsignificant
7	Hand function	STREAM Upper extremity	0.490 (p=0.011)	Moderate positive significant
8	Participation	FIM Social Cognition	0.292 (p=0.148)	Weak positive nonsignificant
Physical		FIM Motor STREAM Basic Mobility	0.291 (p=0.149) 0.263 (p=195)	Weak positive nonsignificant Weak positive nonsignificant

[Table/Fig-2]: Correlation of SIS domains with similar domains of other outcome measures.

[Table/Fig-2] Shows correlation of 8 SIS domains with similar domains of other outcome measures which explains concurrent validity of Gujarati translated version of Stroke Impact Scale version 3.0.

DISCUSSION

Present study aimed to find out validity of Gujarati translation of SIS version 3.0. In phase 2 of face and content validation process, 2 items required rigorous conceptualization regarding its applicability in adult stroke survivors with reference to Indian context. Dressing and food habit of people across the country varies from culture to culture. With reference to eating style, item 5 (difficulty in using fork and knife) has limitation in its applicability to very few high socio economical class people of developing country like India. Here eating pattern with hand is more preferable in the community dwelling people. Use of fork and knife while eating may not be applicable to entire population. So, for cultural adaptation of this item, 3 options (cutting chapatti, making morsel/bite and eating with the spoon) were added.

Similarly in the architectural variations, item no. 6 g (one flair of stairs) may differ in terms of average number of steps. So for better clarity "one flair of stairs – approximately 12 steps" was added.

SIS strength domain was correlated with NIHSS motor using Spearman's correlation where r= -0.254 (p=0.211) which shows weak negative correlation which is nonsignificant. Duncan PW et al., examined the concurrent validity of SIS version 3.0 [13] and SIS-16 using Pearson correlations and the Motricity Index [21] and found excellent correlation with the SIS strength domain (r= 0.67)

SIS Memory domain was correlated with MMSE using Spearman's correlation r= 0.384 (p=0.053). In agreement to the present study

Duncan PW et al., also found an adequate correlation between MMSE and SIS Memory domain (r=0.42) [13].

In the present study SIS domain Emotions was not correlated with any variable. Duncan PW et al., examined the concurrent validity of SIS version 2 and found excellent correlation (r=-0.77) with Geriatric Depression Scale and SF-36 Mental Health (r= 0.74) [12].

SIS domain ADL was correlated with FIM motor component (locomotion + mobility) where moderate positive correlation was found using Spearman's correlation r= 0.323 (p=0.107) which is non-significant. In agreement to present study Duncan PW et al., found excellent correlation of SIS ADL/IADL domain with the Barthel Index (r=0.72) and the Lawton M et al., IADL (Lawton Instrumental Activities of Daily Living) (r=0.77) [13,22].

In the present study SIS Mobility domain was correlated with FIM motor (locomotion + mobility) using Spearman's correlation where moderate positive correlation was found with r= 0.537 (p=0.005) which is highly significant. In agreement to the present study Duncan PW et al., found an excellent correlation of Barthel Index with SIS mobility domain (r=0.69) [13].

In the present study, SIS domain communication was correlated with communication domain of FIM using Spearman's correlation where moderate positive correlation was found with r= 0.559 (p=0.003) which is highly significant. While Duncan PW et al., correlated SIS Version 2 with FIM social/cognition domain and found adequate correlation (r=0.53) and NIHSS Language domain with adequate correlation (r=-0.44) [13].

SIS mobility domain was correlated with STREAM basic mobility domain using Spearman's correlation and moderate positive correlation was found with r= 0.646 (p=0.000) which is highly significant. Along with this mobility domain was correlated with gait speed where weak positive correlation was found with r= 0.273 (p=0.177) which is non-significant. In agreement to present study SIS Version 2 mobility domain was correlated with SF 36 Physical functioning domain and Duke Mobility scale where excellent correlation found with r=0.84 and with r= 0.83 respectively.

SIS hand function domain was correlated with STREAM upper extremity domain where significant moderate positive correlation was found with r= 0.0.490 (p=0.011). Duncan PW et al., has also found excellent correlation of SIS version 2 hand function domain with FMA- Upper extremity Motor component with r=0.81SIS Participation domain was correlated with FIM Social cognition where weak positive correlation was found, with r= 0.292 (p=0.148) [13]. SIS version 2 participation component was correlated with Physical Role and Social Functioning components of SF-36 and adequate correlation (r=0.45) and excellent correlation (r=0.70) was found, respectively. Whereas, with Emotional Role component of SF-3 poor correlation was found with r=0.28 [13].

SIS strength, hand function, mobility and activities of daily living components are combined to form one physical domain which represents the mean of final scores of the four domains.

SIS physical domain was correlated with FIM Motor domain and STREAM basic mobility domain where weak positive correlation was found, with r= 0.291 (p=0.149) and r= 0.263 (p=0.195) respectively. In contrast to the present study, Duncan PW et al., have correlated SIS version 2 Physical domain with Barthel Index [13], FIM Motor, SF-36 Physical functioning and Lawton M et al., IADL where excellent correlation was found, with r=0.76, r=0.79, r=0.75 and r=0.73 respectively [22].

Lin KC et al., evaluated the minimum detectable change (MDC) and clinically important difference (CID) within four physical domains of SIS 3.0 and noted that CID estimates may have been influenced by the age of the participants and baseline degree of severity [23].

The differences in the baseline characteristics of study samples may be responsible for the differences in the strength of correlation compared to Duncan PW et al.

CONCLUSION

Gujarati translated version of SIS version 3.0 is a valid tool to be used in clinical practice.

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