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Original Article

Cross Cultural Adaptation and Validation of Kannada Version of the Motivation in Stroke Patients for Rehabilitation Scale in Hospitalized Stroke Patients

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ABSTRACT

Objective: Stroke survivors are frequently described as apathetic, lacking interest, and having poor motivation, which might hinder treatment outcomes. A Japanese version of the motivation in stroke patients for rehabilitation (MORE) scale was developed to evaluate the motivation level of stroke patients and was translated into an English version by the original author. The following study aimed to cross-culturally adapt and validate the Kannada (local language) version of the MORE scale in stroke patients.

Material and Methods: A structured scale translation procedure was performed by a linguistic expert fluent in English and Kannada in accordance with the stages for linguistic validation. The translation procedure involved forward translation, backward translation, final correction, and preliminary pilot testing. The final cross-culturally adapted Kannada version of the MORE scale was obtained, and validation was evaluated based on criterion validity using Pearson's correlation test. Statistical significance was set at p-value < 0.05. Data were analysed using the SPSS software (SPSS Inc., Chicago, IL, USA) version 29.0.10.

Results: There was a positive correlation (p < 0.05) between the total score of the English and Kannada versions of the MORE scale with a Pearson correlation coefficient of r = 0.995 and an intra-class correlation coefficient of ICC = 0.998 (95% CI for ICC = 0.996-0.998).

Conclusion: The Kannada version of the MORE scale has been culturally adapted to assess motivation among the Kannada-speaking population and is a valid tool for assessing motivation among individuals with stroke.

Keywords: Cross cultural adaptation, Kannada, MORE scale, Motivation, Stroke, Validation

INTRODUCTION

Stroke significantly impacts daily living and quality of life for patients and caregivers,^[1] with one in six people experiencing a stroke.^[2] With over 13.7 million strokes annually and 5.8 million deaths, it is the second-largest cause of death and disability-adjusted life years globally.^[3] Stroke patients often lack motivation and interest, negatively impacting treatment outcomes.^[4] Physiotherapists motivate them to maintain home exercises, but only 31% adhere. Noncompliance can lead to a negative prognosis and hinder recovery.^[5] Motivation is crucial for rehabilitation, enhancing self-directed training and physical activity during hospitalization.^[6]

In neurorehabilitation, motivation serves as a crucial connection between cognition and motor function,

significantly influencing the rehabilitation results. Motivation is conceptually defined as the drive that guides individuals, including animals, to initiate and maintain actions aimed at achieving a specific goal.^[7] Two basic principles influence patients' therapy approaches. The initial point is that the adult brain is plastic or adaptive and can restructure itself to recover compromised cognitive and motor abilities.^[8] The second principle emphasizes the necessity of continuous, specialized motor training for sustained improvements at any stage post-stroke. This training should actively involve the brain's learning systems, motivation, and attention to ensure the effectiveness of the intervention.^[9]

Motivation in stroke rehabilitation is a dynamic phenomenon, with both internal and external motivation playing crucial

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roles.^[10,11] Enhanced inner drive during the early stages of rehabilitation enhances outcomes and determines motor and functional improvements^[4,12] Evaluating motivation as part of pre-rehabilitation assessments helps identify individuals who will benefit most from rehabilitation efforts^[10] Three patient-reported tools for stroke patients are the adapted achievement motivation questionnaire (AAMQ), stroke rehabilitation motivation scale (SRMS), and motivation in stroke patients for rehabilitation scale (MORE scale).^[9]

The MORE scale was recently designed by Yoshida et al.^{[13].} One of the potential motivation evaluation instruments for individuals recovering from stroke is the MORE scale, which investigates both intrinsic and extrinsic motivation by referring to personal and social relationship factors. It has proven to be a reliable instrument for assessing the motivation of stroke patients engaged in rehabilitation. The MORE scale was originally developed in Japanese and is therefore only usable by patients who are proficient in the language. The original author translated the scale from Japanese into English. Due to the absence of assessment tools for motivation levels in the local language, the translation and validation of the Japanese version of the MORE scale into the Kannada language was necessary to assess its adaptability for use in other regions. Therefore, the objective of this study is to cross-culturally adapt and validate the Kannada version of the MORE scale in stroke patients.

MATERIAL AND METHODS

This is a cross-sectional, observational study that included 85 stroke patients from a tertiary care hospital in the southern region of India. Ethical approval was obtained from the Institutional Ethics Committee under the reference number NIPT/IEC/Min//21/2022-2023/. The individuals included in the study were those admitted and visited the Medicine and Neurosurgery departments, as well as those who visited the physiotherapy department of Justice K.S Hegde Charitable Hospital in Mangalore, Karnataka.

Sample size calculation: The sample size for the study was calculated according to the thumb rule. According to the thumb rule, taking five points for each item on the scale, the required sample size was 85. That is., there are 17 items on the MORE scale, so $17 \times 5=85$.

Scale translation and cross-cultural adaptation: A structured scale translation procedure was performed by a linguistic expert fluent in English and Kannada in accordance with the stages for linguistic validation. Prior to the translation of the scale, permission for the translation of the MORE scale to the Kannada version was granted by the original author, Taiki Yoshida.^[13] The translation procedure involved forward translation, backward translation, final correction, and

preliminary pilot testing, which were performed with five samples of stroke patients, and the necessary modifications were made. The final cross-culturally adapted Kannada version of the MORE scale was obtained, and validation was performed on 85 stroke samples after ethical clearance from the institution's scientific committee.

Inclusion and exclusion criteria: Patients who are diagnosed with first-time ischemic or hemorrhagic stroke, including both males and females, undergoing physiotherapy treatment with Glasgow Coma Scale^[14] score>12 and Mini-Mental State Examination^[15] score>21, who agree to participate in the study. Those who did not know how to read and understand English and Kannada and were medically unstable were excluded from the study.

Criterion validation: Patient data were collected via a data collection form, which included patient identity number, age, sex, occupational and educational status, type of stroke, lesion side, and hand dominance. After obtaining consent from the patient, both the Kannada and English versions of the MORE scale were administered to the same patient, and scale validation was carried out based on criterion validity using Pearson's correlation test.

Scale items: The MORE scale encompasses 17 items that are organized into multiple categories. Four of these items (1, 2, 3, and 4) pertained to patients' goals, whereas three items (11, 12, and 13) related to success and failure experiences. Item 14 focused on physical condition and cognitive function, and items 16 and 17 pertained to resilience. Four items (5, 6, 7, and 8) related to the influence of rehabilitation professionals, with item 9 pertaining to patients' relationships, item 10 to patients' supporters, and item 15 to patients' behaviour changes. The MORE scale uses a Likert scale to evaluate each of its 17 items, with rating options ranging from "strongly disagree" (1) to "strongly agree" (7).^[13]

RESULTS

The collected data were summarized using descriptive statistics: frequency, percentage, mean, and S.D. A paired t-test was used to compare the English and Kannada versions of the MORE. To find the agreement between each component of both versions of the MORE scale, the Pearson correlation coefficient ("r"), as well as the intra-class correlation coefficient (ICC), were used. Statistical significance was set at p-value < 0.05. Data were analysed using the SPSS software (SPSS Inc., Chicago, IL, USA) version 29.0.10.

This study included 85 stroke patients who received physiotherapy. Of these, 55 were male and 30 were female, accounting for 64.7% and 35.3% of the participants, respectively. In terms of education, 44.7% had completed 10th grade, 25.9% had finished 12th grade, 15.3% were

undergraduates, and 14.1% had completed 8th grade. Regarding the location of the brain lesions, 45.9% had lesions on the right side, and 54.1% had lesions on the left side. The types of strokes were distributed, with 24.7% of the patients having haemorrhagic stroke and 75.3% having ischemic stroke. Hand dominance showed that 96.5% of the participants were right-handed handed, and 3.5% were left-handed. The occupational distribution included 16.5% teachers, 15.3% individuals in business, and 10.6% housewives. The remaining participants were accountants, retired individuals, and bank employees, accounting for 9.4%, 8.2%, and 7.1% of the sample, respectively, and a few had other occupations [Supplementary Table 1].

A paired t-test was used to compare the components of the English and Kannada versions of the MORE. There was no significant difference (p > 0.05) in the entire component of the MORE scale between the English and Kannada versions [Supplementary Table 2].

The Pearson correlation coefficient ("r") as well as the ICC were used to find the agreement between the cumulative scores of the English and Kannada versions of the MORE scale. There was a strong positive correlation (p < 0.05) between the total score of the English and Kannada versions of the MORE scale. In addition, the obtained ICC coefficient was found to be significant (the 95% CI for ICC did not include the value of "zero") for the cumulative score between the two versions.

Hence, the translated version of the MORE scale was a valid tool for evaluating motivation levels in Kannada-speaking stroke patients [Table 1, Figure 1].

Table 1: Cumulative score of the English and Kannada versionsof the MORE scale.				
Cumulative score	"r"	p-value	ICC	95% CI for ICC
English and Kannada	0.995	< 0.001*	0.998	0.996 to 0.998*
r: Pearson correlation coefficient, ICC: Intraclass correlation coefficient, CI: Confidence interval, * Significant, p value < 0.05. MORE: Motivation				

in stroke patients for rehabilitation scale.

DISCUSSION

In this study, the MORE scale was translated into Kannada, and validation was performed in Kannada-speaking stroke patients. This study revealed that the Kannada adaptation of the MORE scale proved efficient in assessing the degree of motivation for rehabilitation among stroke patients undergoing treatment in a rehabilitation unit. It could serve as a tool for healthcare professionals to identify fading motivation in patients, motivate them to actively engage in rehabilitation activities, and facilitate their return to regular daily routines. Cross-cultural adaptation and translation of the MORE scale to Kannada is important because, to date, no motivational tools are available to evaluate the motivational



Figure 1: Agreement between the English and Kannada versions of the MORE scale. There was a strong positive correlation (p < 0.05) between the total scores in the English and Kannada versions of the MORE scale. MORE: Motivation in stroke patients for rehabilitation

level of Kannada-speaking stroke patients. Kannada is the primary language spoken in the Indian state of Karnataka and is one of the official languages of India. Much of the population in Karnataka speak Kannada, and it is also spoken in neighbouring states. Given that the MORE scale is a patient-reported outcome measure, it is crucial to have it available in the language spoken by patients to increase patient compliance and understanding.

Cross-cultural adaptation is necessary to ensure that the concepts and items within the scale are equal in the original and translated scales. Maintaining the scale's accuracy and consistency across various cultural settings is crucial. Failure to adapt instruments can lead to misinterpretations and misleading findings, as concepts and items may not be understood in the same way across cultures.^[16] In this study, cross-cultural adaptation plays a crucial role because the MORE scale was developed in Japan, and Japanese and Indian cultures are different. The English version of the MORE scale is straightforward and easily comprehensible by stroke patients. A pilot test of the Kannada translation was conducted with a small group, which led to minor modifications. The revised Kannada MORE scale was then administered to 85 participants to assess criterion validity, with the English version serving as a reference point for comparison.

The study compared the English and Kannada versions of the MORE scales and found no significant difference (p > 0.05) in the entire component, with a cumulative score of t = 0.63, p = 0.530. The study also evaluated the agreement between the two scales and found a strong positive correlation (p<0.001) between the components with r = 0.995 and ICC = 0.998 (95% CI for ICC = 0.996-0.998). A study on the cross-cultural adaptation and validation of the Kannada version of the MORE scale for stroke patients' motivation for rehabilitation yielded significant results. The positive correlation between the total scores of the English and Kannada versions of the MORE scale (r = 0.995) indicated a strong relationship between the two versions. Additionally, the high intra-class correlation coefficient (ICC) of 0.998 further supports the reliability and consistency between the English and Kannada versions. These findings suggest that the translation and cross-cultural adaptation processes effectively maintained the essence and measurement properties of the original MORE scale across languages. The high correlation coefficients indicate that the Kannada version captures motivation for rehabilitation in stroke patients as effectively as the English version does.

In support of the current study, Yoshida *et al.*^[13], Park *et al.*^[17] and Tan *et al.*^[18], studies validated the motivation scale in patients with stroke, which resulted in a positive correlation between the scales with r = 0.951, r = 0.536,

and r = 0.207, respectively, whose values are closely related to the current study. In contrast to the current study, Kusec *et al.*^[19] compared Motivation for Traumatic Brain Injury Rehabilitation Questionnaire (MOT-Q) with the Brain Injury Rehabilitation Trust Motivation Questionnaire-Self (BMQ-S) and found no correlation, but MOT-Q correlated with insight (r = -0.37) and BMQ-S with insight, apathy, depression, and anxiety r=-0.44, r=0.50, r=0.55 and r=0.49 respectively. Tatla *et al.*^[20] compared the Pediatric Motivation Scale (PMOT) with the Pediatric Volitional Questionnaire (PVQ) and found a moderate correlation in the rehabilitation subsample (r =0.71, p<0.01) but no correlation with the healthy subsample (p > 0.05).

In conclusion, this study's outcomes demonstrate that the cross-cultural adaptation and validation of the Kannada version of the MORE scale have been highly successful, providing a valuable tool for assessing motivation in stroke patients undergoing rehabilitation in Kannada-speaking populations.

CONCLUSION

The culturally tailored Kannada version of the MORE scale is a reliable instrument for evaluating motivation within the Kannada-speaking community, particularly among individuals who have experienced stroke. This study suggests a way to improve the rehabilitation behaviour of stroke patients, with the goal of motivating patients to exercise, thereby assisting medical professionals in optimizing treatment by evaluating the motivational level of stroke patients using the MORE scale.

Ethical approval: The research/study approved by the Institutional Ethics Committee at Nitte Institute of Physiotherapy, number NIPT/ IEC/Min//21/2022-2023 dated 9th February 2023.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent.

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