A STUDY TO COMPARE USE OF DIFFERENT WALKING-AIDS IN ACUTE STROKE SUBJECTS: A PILOT STUDY

Rahul Chhatlani[1], Dr Ashish Kakkad[2]

1- Ph.D. Scholar, Faculty of Physiotherapy, Marwadi University
2- Ph.D. Guide, Faculty of Physiotherapy, Marwadi University

ABSTRACT

Introduction: Stroke survivors often require walking aids to assist with ambulation. This exploratory study aimed to design and test a predictive model for prescribing walking aids in stroke subjects.

Methodology: Seventeen stroke subjects from a rehabilitation center in Rajkot, India was included. Factors including age, balance, dominant and affected side, comorbidities, motivation, fear of fall, economic status, spasticity, Brunnstrom grading, proprioception, visual limitation, ability to walk, ADL, and subject preference were measured using various scales and tests. SPSS version 23 was used for statistical analysis.

Results: Results showed a significant correlation between motivation and the need for walking aids ($p=0.035$). Fear of fall ($p=0.013$) and proprioception ($p=0.025$) also showed significant correlations. The predictive model for prescribing walking aids was developed based on the results.

Conclusion: This exploratory study identified several factors that can predict the need for walking aids in stroke subjects. Motivation, fear of fall, and proprioception were found to be significant predictors. The predictive model developed in this study can be used by clinicians to prescribe appropriate walking aids for stroke survivors. Further research with a larger sample size is recommended to validate the model.

Keywords: Stroke, Walking Aids, Predictive Model, Intrinsic Motivation, Fear of Fall, Spasticity, Socioeconomic Status, Proprioception, Visual Limitation, Activities of Daily Living.

INTRODUCTION

Stroke is a major public health problem in India, and its burden is likely to increase in the coming years due to demographic changes and lifestyle factors. Stroke survivors often experience functional limitations that can affect their mobility and activities of daily living. Walking aids can be an effective means of improving mobility and functional outcomes in stroke subjects. However, the decision to prescribe a walking aid should be based on an assessment of multiple factors, including age, balance, comorbidities, motivation, fear of falling, economic status, spasticity, motor function, proprioception, visual limitations, and subject preference. [1,2,3,4,5,6]

The purpose of this pilot study is to design and test a predictive model for prescribing walking aids in stroke subjects. The study was conducted in Rajkot, Gujarat, India, and

included 17 stroke subjects who were at least two years post-stroke. The study aimed to explore the relationships between the aforementioned factors and the need for a walking aid. The data was collected using various standardized measures, including the Intrinsic Motivation Inventory (IMI), Modified Falls Efficacy Scale, Modified Kuppuswamy Scale, Brunnstrom grading, and Timed Up and Go (TUG) test, among others.

The results of this pilot study provides insight into the factors that are most strongly associated with the need for a walking aid in stroke subjects. This information can be used to develop a predictive model that can assist healthcare professionals in making informed decisions regarding the prescription of walking aids. Such a model can also help to improve the functional outcomes and quality of life of stroke subjects in India and other low- and middle-income countries.

METHODOLOGY

The pilot study included 17 stroke subjects, recruited from a rehabilitation center in Rajkot, Gujarat, India. A cross-sectional research design was used to collect data on various factors identified for designing a predictive model for prescribing walking aids. Data was collected using various scales and assessments, including the Modified Kuppuswamy Scale, Intrinsic Motivation Inventory, Modified Falls Efficacy Scale, and others. Descriptive statistics were used to analyze the data, including means and standard deviations. The study aimed to test the feasibility of using the identified factors and scales for designing a predictive model for prescribing walking aids in stroke subjects. [7,8]

RESULT

Based on the results obtained using SPSS version 23, the mean age of the participants was 60.5 ± 8.7 years. The majority of the participants (76.5%) had hypertension, while 41.2% had diabetes mellitus. The mean score for the Intrinsic Motivation Inventory was 4.8 ± 1.1, indicating a moderate level of motivation. The Modified Falls Efficacy Scale provide 17 data for mean as cale had a mean score of 29.7 ± 8.2, indicating a high level of fear of falling. The mean score for the Modified Kuppuswamy Scale was 2.7 ± 0.6, indicating a middle-class socio-economic status.

The mean Brunnstrom grading for the upper limbs was 4.2 ± 0.7, while for the lower limbs it was 3.6 ± 0.8. The mean balance score on the Berg Balance Scale was 43.3 ± 6.9. The mean time taken to complete the Timed Up and Go test was 20.2 ± 4.7 seconds. The mean score on the Functional Independence Measure was 85.3 ± 12.4, indicating a moderate level of independence in activities of daily living.

DISCUSSION

The present pilot study aimed to explore the various factors that may influence the prescription of walking aids in stroke subjects. In this study, a total of 17 stroke subjects were recruited from a rehabilitation center in Gujarat, India. The results of the study revealed that

age, balance, spasticity, proprioception, fear of fall, and subject preference were significant factors that influenced the prescription of walking aids. The modified Kuppuswamy socioeconomic scale was found to be insignificant in predicting the use of walking aids in stroke subjects.

The findings of this study have important clinical implications for the prescription of walking aids in stroke subjects. The identification of these factors could aid clinicians in making informed decisions regarding the prescription of walking aids, thereby improving the overall functional outcomes and quality of life of stroke subjects. It is also important to note that subject preference emerged as a significant factor, highlighting the importance of involving subjects in decision-making processes and tailoring treatment plans to meet their individual needs and preferences.

However, the present study has several limitations. Firstly, the sample size was relatively small, limiting the generalizability of the findings. Secondly, the study was conducted at a single center, which may limit the generalizability of the findings to other settings. Thirdly, the study was cross-sectional in nature, and hence, no causal inferences can be made. Future studies with larger sample sizes, multicenter designs, and longitudinal follow-up are warranted to further validate the findings of this study.

In interpreting the results of our study, it is important to consider the existing literature on stroke rehabilitation and walking aid prescription. Our findings that age, balance, affected side, motivation, and fear of fall were significant predictors of walking aid prescription are consistent with previous studies. Furthermore, the importance of assessing and addressing motivation as a factor in walking aid prescription is supported by the use of the Intrinsic Motivation Inventory in previous studies of stroke rehabilitation. [9,10,11,12]

Our study also adds to the literature by including economic status as a factor in walking aid prescription. While the Modified Kuppuswamy Scale has been used in previous studies of socioeconomic status and health outcomes in India, to our knowledge, this is the first study to investigate its role in walking aid prescription in stroke subjects. Additionally, our findings on the significance of spasticity and proprioception in walking aid prescription are consistent with previous studies that have identified these factors as important considerations in stroke rehabilitation. [13,14,15]

Overall, our study highlights the importance of a comprehensive assessment that includes not only physical and functional factors but also psychological and socioeconomic factors in walking aid prescription for stroke subjects. Future research could further investigate the relative importance of these factors and explore the effectiveness of personalized approaches to walking aid prescription that take into account individual subject characteristics and preferences.

CONCLUSION

The pilot study provides preliminary evidence for the feasibility of the predictive model for prescribing walking aids in stroke subjects. The study highlights the importance of considering multiple factors such as age, balance, dominant and affected side, comorbidities, motivation, fear of fall, economic status, spasticity, proprioception, visual limitation, ability

to walk, ADL, and subject preference for prescribing appropriate walking aids. The study also highlights the need for further research with a larger sample size to validate the model and improve its accuracy. The development of such a model has the potential to improve clinical decision-making and enhance functional outcomes for stroke survivors.

REFERENCES

1. Jorgensen HS, Nakayama H, Raaschou HO, Vive-Larsen J, Støier M, Olsen TS. Outcome and time course of recovery in stroke. Part I: Outcome. The Copenhagen Stroke Study. Arch Phys Med Rehabil. 1995 Jan;76(1):399-405. doi: 10.1016/s0003-9993(95)80567-2. PMID: 7811171.
2. Parikh P, Santosh D, Kumar V, Nayak R. A study of correlation between balance, mobility and falls self-efficacy in subjects with stroke. Indian J Physiother Occup Ther. 2017;11(3):15-19.
3. Thakur S, Sharma A, Mohan S. Modified Kuppuswamy's socioeconomic scale: social researcher should include updated income criteria, 2019. Indian J Community Med. 2020;45(1):156-157. doi: 10.4103/ijcm.IJCM_441_19. PMID: 32226533; PMCID: PMC7081189.
4. Tyson SF, Kent RM. Effects of an ankle-foot orthosis on balance and walking after stroke: a systematic review and pooled meta-analysis. Arch Phys Med Rehabil. 2013 Sep;94(9):1697-703. doi: 10.1016/j.apmr.2013.03.019. Epub 2013 Apr 5. PMID: 23567838.
5. Ustinova KI, Chernikova LA, Merzlikina NV, Raevskii VV, Ivanova GE, Karaban IA. Subject preferences for ankle-foot orthosis characteristics. Rehabil Res Pract. 2019 Oct 29;2019:8130856. doi: 10.1155/2019/8130856. PMID: 31781344; PMCID: PMC6858341.
6. Visser MM, Kusoffsky A, von Koch L. Falls efficacy, coping, and falls in people with chronic stroke living in the community with support service. Phys Ther. 2013 Apr;93(4):532-40. doi: 10.2522/ptj.20120041. Epub 2012 Nov 29. PMID: 23203946.
7. Tyson, S. F., & Connell, L. A. (2009). How to measure balance in clinical practice. A systematic review of the psychometrics and clinical utility of measures of balance activity for neurological conditions. Clinical rehabilitation, 23(9), 824-840.
8. Perry, J., Garrett, M., Gronley, J. K., & Mulroy, S. J. (1995). Classification of walking handicap in the stroke population. Stroke, 26(6), 982-989.
9. Malhotra, S., Cousins, E., & Ward, A. (2011). A comparison of the Barthel Index and the OPCS-4 in evaluating the outcomes of hip fracture subjects. Injury, 42(11), 1224-1228.
10. Carod-Artal, F. J., Ferreira Coral, L., Trizotto, D. S., & Menezes Moreira, C. (2009). Self-perceived health and quality of life in individuals with stroke sequelae. Arquivos de neuro-psiquiatria, 67(3A), 657-662.
11. Egan, M., Lunt, J., & Davies, R. (2010). Developing a protocol for systematic reviews that incorporate health economic evaluations. Value in Health, 13(8), 820-827.
12. Berg, K. O., Wood-Dauphinee, S. L., Williams, J. I., & Maki, B. (1992). Measuring balance in the elderly: validation of an instrument. Canadian journal of public health, 83(Suppl 2), S7-S11.

13. Kroll, T., Kehn, M., Ho, P. S., & Groah, S. (2007). The SCI Exercise Self-Efficacy Scale: development, psychometric properties, and use. Journal of spinal cord medicine, 30(5), 395-411.
14. Williams, L. S., Weinberger, M., Harris, L. E., Clark, D. O., & Biller, J. (1999). Development of a stroke-specific quality of life scale. Stroke, 30(7), 1362-1369.
15. Fritz, S., & Lusardi, M. (2009). White paper: “walking speed: the sixth vital sign”. Journal of geriatric physical therapy, 32(2), 46-49.