EXTENDED ABSTRACT

An Ergonomic Analysis of Malaysian Elderly Walking Frame User Posture

Mohd Rizal Hussain[1], Asmidawati Ashari[2], Rahimah Ibrahim[1], Ruhaizin Sulaiman[3]

[1] Laboratory of Medical Gerontology, Malaysian Research Institute on Ageing (MyAgeing™), Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia
[2] Department of Human Development and Family Studies, Faculty of Human Ecology, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia
[3] Department of Industrial Design, Faculty of Design and Architecture, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia

Corresponding email: mrizal@upm.edu.my

SUMMARY

This study was to analyze walking frame user posture among the 15 participants of Malaysian elderly aged 60 and above in Selangor and Kuala Lumpur. This study utilized two postural observations and a computer simulation of the elderly user using Rapid Entire Body Assessment (REBA) and Rapid Upper Limb Assessment (RULA) analysis. The results revealed that the majority of respondents show a slightly bent posture, bowed their heads and appears difficulty during the use walking frame, which requires further investigation and appropriate techniques in the way the walking frame is used. Some recommendations were also suggested in this study.

Keywords: Walking Frame, REBA, RULA, Elderly, Malaysia

INTRODUCTION

A walking frame is frequently prescribed and used by elderly people to compensate for deficiencies in balance, coordination, strength, as well as avoid the risk of falling while walking. Malaysian elderly are also not excluded from using this walking frame. Although there are research findings that show the benefits of using a walking frame, there are some issues reported by other studies on walking frame use that may contribute to harm to personal health and increase the risk of falls for users, especially on the ergonomic aspect (1,2,3) However, to what extent does the use of a walking frame affect the user in terms of ergonomics, particularly body posture? Thus, this study was to analyze walking frame user posture during usage among Malaysians elderly.

METHODOLOGY

A total of 15 participants of community-dwelling older persons walking frame users aged 60 and above in Selangor and Kuala Lumpur were recruited via purposive and snowball sampling. This study conducted postural observations using Rapid Entire Body Assessment (REBA) worksheet form and a computer simulation using Rapid Upper Limb Assessment (RULA) analysis in Computer Aided Application namely CATIA. REBA is a method of assessing risk factors for overall body disorders based on posture (4), with the assessment consist several body postures (trunk, neck, legs, upper arm, lower arm and wrist). While RULA is a technical method for use in ergonomics studies of workplaces where reports of work-related upper bodies (neck, trunk, upper limbs) are made. 5th percentile manikin female and 95th percentile manikin male were created for use in simulation based on Malaysian elderly anthropometry data. Data analysis generates a score that represents the level of MSD risk (Fig. 1).

Score	Level of MSD Risk
1	negligible risk, no action required
2-3	low risk, change may be needed
4-7	medium risk, further investigation, change soon
8-10	high risk, investigate and implement change
11+	very high risk, implement change

Fig. 1: REBA and RULA MSD risk description

RESULTS AND DISCUSSION

Results of REBA assessment during observation revealed that the majority of participants obtained a score of between 4 to 7 during sit-to-stand (53.3%) and walk with walking frame (73.3%) tasks, which classified

medium risk levels that need further investigation and changes. This is because their postures show slightly bent and bowed heads (Fig. 2). A similar result was also obtained through RULA analysis for both posture tasks with a final score of 6, which require changes in the way a walking frame is used (Fig. 3). It might cause difficulty and discomfort as well as require more energy consumption, which may indirectly increase the risk of body instability and falls due to a posture disturbance (5). Some recommendations may be suggested such as taking the user's anthropometry aspect into account during usage and providing a manual or demonstration on how to use the walking frame appropriately and ergonomically.

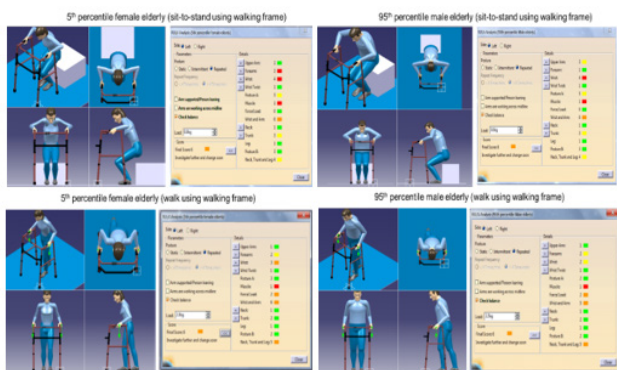**Fig. 2: User posture during sit-to-stand and walk with walking frame**

Fig. 3: Simulation of RULA analysis

CONCLUSION

The study through REBA and RULA tools revealed that Malaysian elderly walking frame users were subjected to poor ergonomics practices. As a result, suggestions for improvement have been made for future action to reduce the negative impact on the user's physical and mental health.

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