Pertanika Proceedings 1 (6): 195 - 199 (2025)

PERTANIKA JOURNALS

PERTANIKA PROCEEDINGS

Journal homepage: http://www.pertanika.upm.edu.my/

Optimising Walking Frame Use among the Elderly: Proposed Recommendation based on User Condition, Walking Frame Design, and Physical Environment Challenges

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ABSTRACT

The effective use of walking frames is essential for enhancing mobility and safety among the elderly individuals with mobility impairments. However, the effective use of walking frames can be hindered by various challenges or issues. This study aims to develop comprehensive recommendations to optimise the use of walking frames among the elderly. Semi-structured interviews and postural observation with walking frame users were performed to gain practical insights. Data were analysed using thematic analysis and postural assessment to identify recurring themes and inform the development of the proposed recommendation. The study identified three main themes of challenges: user-specific issues, walking frame design, and environmental factors. Common user-related issues included physical weakness, imbalance, and fear of falling. Design-related challenges were less quality, no adjustable width function, slow movement, and expensive. Environmental challenges were primarily related to uneven surfaces, slippery floor, and narrow space. Based on these findings, specific recommendations were developed to address each category of the challenges. The proposed recommendations are intended to serve as a foundation for usage and future studies on walking frames, and also are expected to contribute towards the advancement of healthy aging and quality of life for the elderly in Malaysia.

Keywords: Elderly, Malaysia, recommendation, use, walking frame

ARTICLE INFO

Article history:
Received: 30 September 2025
Published: 28 November 2025

DOI: https://doi.org/10.47836/pp.1.6.031

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INTRODUCTION

As the global population ages, the importance of mobility aids, particularly walking frames for the elderly is increasingly recognised. These aids enhance safety and independence

by providing crucial support for walking, reducing fall risks, and enhancing confidence. However, many elderly users face challenges in effectively using walking frames due to various factors, including individual conditions, design issues, and environmental obstacles. User conditions such as physical health, cognitive function, and prior mobility experiences greatly influence how well an elderly person can utilise a walking frame. Some designs may be better suited for users with different levels of strength, balance, and coordination. For instance, those with weak upper bodies may struggle with heavier frames. Additionally, design aspects like weight, adjustability, and aesthetics can affect user engagement; overly heavy or difficult-to-adjust frames may discourage use, leading to reduced mobility and increased reliance on caregivers. The physical environment also plays a critical role, as many elderly individuals live in homes with uneven floors, cluttered spaces, or challenging outdoor areas, which can create obstacles and diminish feelings of safety and autonomy while using walking frames. Thus, in order to create focussed recommendations for maximising walking frame use among the elderly, this study intends to explore these interrelated factors: user conditions, walking frame design, and environmental challenges. These suggested recommendations may serve as a foundation for future research on walking frames and also make a significant contribution to the advancement of healthy aging through a supportive design.

METHODOLOGY

A total of 30 community-dwelling elderly people in Selangor and Kuala Lumpur, aged 60 years and above, who are current walking frame users, participated in this study. Participants were selected through purposive sampling to ensure a diverse representation of experiences. Prior to the data collection, all participants received complete information about the study and signed an informed consent form. To obtain useful insights, semi-structured interviews (face-to-face or via phone) were conducted. An interview guide facilitated discussions on the various aspects of walking frame use, including ownership, usage patterns, challenges encountered, suggestions for improvement, and sociodemographic information. All interviews were digitally recorded using a voice recorder to ensure accurate data capture. Then, a thematic analysis by Braun and Clarke (2006) as shown in Figure 2 was used on the interview data in the form of verbatim transcripts. In addition, two postural observations (the elderly standing and walking with the assistance of a walking frame) using the Rapid Entire Body Assessment (REBA) worksheet form (Figure 1) were also carried out. The Digital Rapid Upper Limb Assessment (RULA) analysis was employed to analyse postural assessment data. The study was granted ethical approval by the Universiti Putra Malaysia Ethics Committee for Research Involving Human Subjects (reference: JKEUPM-2018-122).

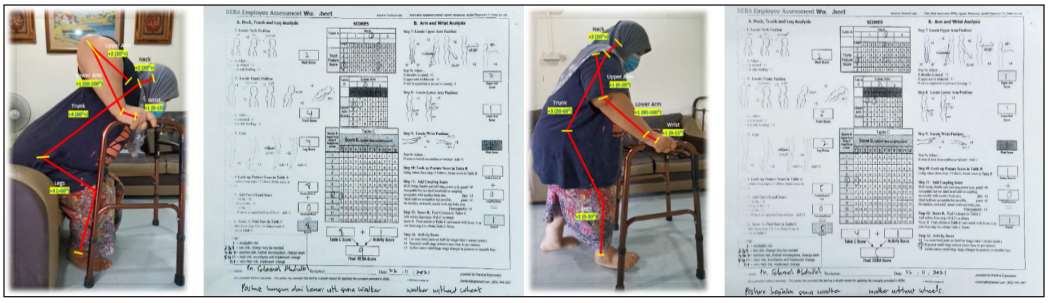

Figure 1. REBA assessment during stand-up and walking using walking frame

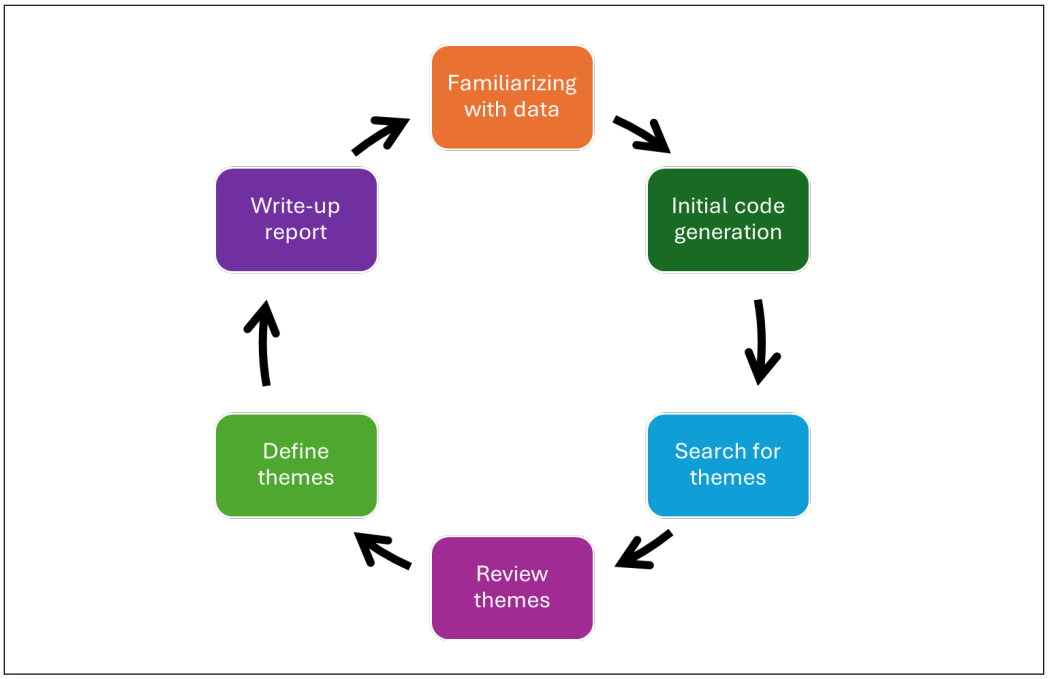

Figure 2. Braun and Clarke (2006) thematic analysis
Source: Braun and Clarke (2006)

RESULTS

Based on the study's findings, recommendations to improve the walking frame guidelines for the elderly users in Malaysia are focussing on addressing the identified issues (Table 1). Besides, a RULA simulation study (Figure 3) suggests that users should first use the chair arm for support before reaching for the walking frame when standing up or sitting down. This approach reduces pressure and discomfort on the upper arm, wrist, and body posture compared to using the walking frame directly. Additionally, it is recommended that users maintain an upright posture and face forward while walking with the frame, as this position

Table 1
Recommendation guidelines for Malaysian elderly walking frame users

Theme issue	Sub-theme issue	Issues	Recommendation guidelines
User condition	Physical	Physical imbalance, limb weakness, surgery on leg/hand due to injury, fatigue	To use a walking frame effectively, first move it forward a short distance after standing up. Step forward with your injured or weaker leg, using your palms for support, followed by your stronger leg. Ensure your feet are at a comfortable distance apart and within the frame's boundaries. Adjust the frame's height for optimal hand grip comfort. Move each side of the frame alternately while walking, without lifting both sides simultaneously. Additionally, perform regular leg exercises, either independently or with a physiotherapist.
	Psychology	Fear of falling, less confident	To obtain guidance and demonstration of proper use from physiotherapy or professional.
Walking frame	Quality	Noise, the handle is damaged easily, the frame is loose, broken wheels, damage rubber pad	To conduct regular inspection to ensure it is in good condition. Replace or repair any damaged parts.
	Design	No adjustable width function, the wheels slide easily, unable to climb stairs/level and less stable due to lightweight	Manufacturers should offer extra-wide walking frames with adjustable mechanisms for larger users. For users, when walking or descending gradients, use brakes to control speed. Seek assistance from a caregiver when navigating stairs, and always follow proper usage procedures.
	Usage	Difficult to stand-up, slow movement	Follow proper usage procedures provided by a professional/physical therapist.
Physical environment	Home environment	Slippery floors, uneven floor, narrow spaces, obstacle	Ensure that the user's path at home while using the walking frame is clear of obstacles, and use anti-slip mats on slippery floor surfaces for safety.

enhances balance by aligning the centre of mass with the base of support. Getting closer to the device also can further improve stability for the user.

CONCLUSION

The effective use of the walking frames is vital for improving mobility and safety among elderly individuals with mobility impairments. This study identified several challenges that hinder their effectiveness and use. The proposed recommendations aim to enhance walking frame usage and serve as a foundation for future research, ultimately contributing to a healthier aging and an improved quality of life for the elderly in Malaysia.

Figure 3. RULA simulation analysis on Malaysian elderly male and female using recommendation technique during stand-up/sit-down and walking using walking frames

ACKNOWLEDGEMENT

Sincere gratitude to everyone who contributed to this study. Special thanks to the elderly participants, Hospital Sultan Abdul Aziz Shah (HSAAS), UPM, and team members for invaluable support, guidance, and insights.

REFERENCES

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. https://doi.org/10.1191/1478088706qp063oa