PREPARING FOR RESEARCH IN HEALTH

Table of Contents

Section 2: Literature Review Primary text

Introduction

Healthcare advancements and how they improve patient outcomes are influencing the pragmatism of Health Research. They rely a lot on health research. Ever wondering about walking aids is to think about job completion time, and they play a significant role. Walking aids are varied. They include walking frames, canes, and crutches and help people move better. With an ageing population and frailty on the rise, many people are using walking aids. They are crucial to health care in the UK.

For helping those who struggle with mobility, one must understand how effective these aids are. Preparing a literature study is to see how a new walking frame design impacts thing. It will compare to the standard version in terms of task performance time. They will cover everything from benefits and problems to design issues related to walking aids.

Importance of Walking Assistance

Walking aids, those awesome devices helping people move easier and more comfortably, are super necessary. These handy tools come in all shapes and sizes, including canes, crutches with balance walkers, and bespoke frames. Each one is designed to cater to specific needs and support levels. The role of walking aids in health is enormous. They are necessary for people to maintain and regain independence in daily activities.

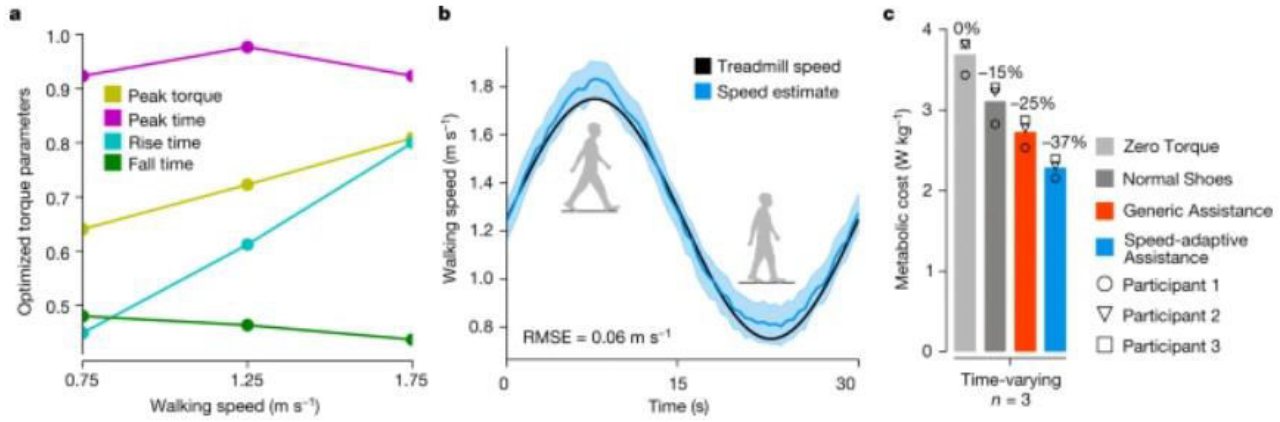

Figure 2: Speed Adaptive Control

(Rahman and Thelen, 2019)

Walking aids are often used by those with health issues like joint disorders, nerve problems, or troubles related to ageing. As more people face problems with walking due to ageing and health conditions, the need for walking aids has increased. More older people in population means It needs to be understood the use of these devices. Also, older people have a higher risk of falling. That is where walking aids step in. They help prevent falls and improve safety by offering firm support. They reduce accident risk and following injuries. By saving energy and reducing stress on joints, they let people do things they found hard or could not do before.

Benefits of Walking Aids

Walking aids can really boost the life quality and function of people with mobility issues. They offer some big pluses, such as better balance and support. These tools are crucial in lowering fall chances, particularly for those with nerve or joint problems. With more stability, individuals feel confident to be more active, encouraging greater independence.

Not to mention, walking aids have been shown to significantly improve how people walk and how fast they do it. For example, someone with a joint disorder like osteoarthritis or a nerve issue impacting their walking can find it much easier to move with the help of these devices. These devices help make walking smoother and better controlled.

Walking aids offer mental benefits besides offering physical help. They lower the worry of moving around, allowing to leave places and mix with society. This breaks away from feelings of being confined or alone and encourages a feeling of belonging and friendly chat.

Walking aids prove vital for healing and betterment in therapeutic settings. They become an interim help assisting people recovering from surgery or injury in regaining strength and trust, thereby quickening the healing timeline (Rahman and Thelen, 2019).

Challenges and Issues Faced with Walking Aids

Walking aids are helpful but not free from problems and possible negatives. There is a risk of discomfort and adjusting woes with these devices. Walking aids can lead to pain, sores, and muscle strain if they do not fit properly or are adjusted to the unique needs of the individual (Hersh, 2022). According to (Huang and Chang, 2020)there may be resistance to accepting walking aids due to the worry of appearing weak or dependent. Hence, it is vital to change these societal beliefs to ensure that people get the needed help without feeling labelled (Morkunas, Paschen and Boon, 2019).

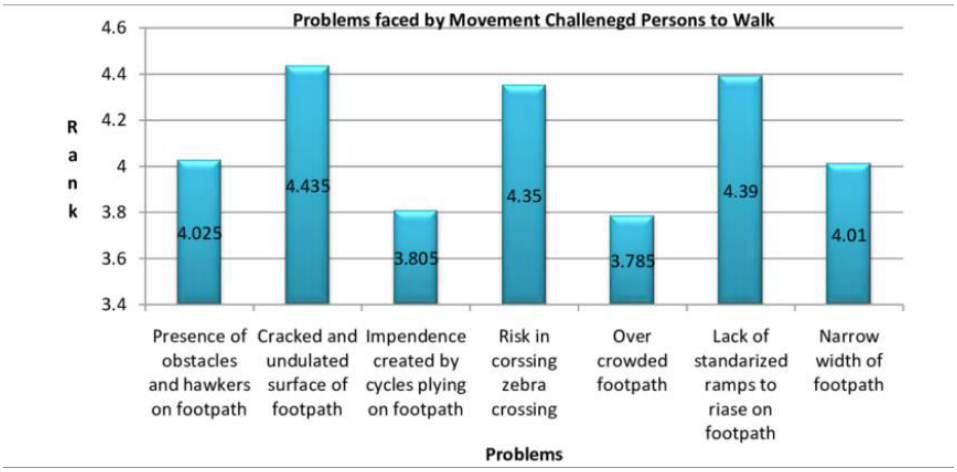

Figure 1: Physically challenged persons' issues to walk

(Bocken *et al.*, 2019)

Moreover, uneven terrain or limited access can pose difficulties for those using walking assistance. Crowded places, stairs, and public transport can be hard to deal with. These situations must be factored in while checking the suitability and effectiveness of walking aids in different environments (Tijjani, Kumar and Boukheddimi, 2022).

Walking aids can be costly to buy and keep up. This can hit hard for folks with low income or scarce insurance. It is critical, then, to make sure these items can be had by everyone, no matter their mobility issues. This ensures equal chances for all.

Discussions on Walking Aid Design

How well a walking aid works and how much a user likes it depends significantly on how it is made. For these tools to offer superior support and feel comfortable, their form should match the body's needs. Things like the grip's angle and handle height should be easy to tweak. When walking aids are adjusted just right, they lessen physical stress and discomfort. This way, they can be used for more extended periods comfortably (Rianmora and Poulpanich, 2022).

This aside, the materials used to make walking aids matter a lot, too. Materials like carbon fiber composites and aluminium are both solid and lightweight. Moreover, this ensures the aids last longer while still being easy to use (Lüdeke-Freund, Gold and Bocken, 2019).

Besides, the ability to maneuver is essential. For instance, spin casters or wheels that swivel make moving and turning easier. Brakes give users a sense of control during movement. Walking aids should also be built for different environments. Things like robust structures for outdoor usage and

easy-to-fold designs for storage in tight places are essential. Plus, advances have led to tailored walking frames that even have seats, storage, or support to help posture (Ma *et al.*, 2020).

Analysing Information

It is crucial to look deep into the research that has been received need to evaluate whether it has good points or bad points. Utilizing this tool is also called the PICO (Population, Intervention, Comparison, Outcome) framework. It is really good at checking if the research methods are up to scratch (Lindh-Rengifo *et al.*, 2021).

Good Elements: Some things make a study strong. High-quality studies use good designs, like real-life observations or randomized controlled trials (RCTs). These methods are suitable as they keep the research unbiased and can make connections.

A large sample size is also good, giving much power to the findings and strengthening conclusions (Minion *et al.*, 2021).

Creatively designed studies, which give details about new and old walking frames - their design, alterations, and how to use them - are all helpful in copying the study and applying its results in healthcare (McDonald and Eisenhardt, 2020).

Bad Elements: Studies can go wrong, too. If the study lacks blinding, that can be a problem. Without blinding, participants and evaluators know the treatment used, which can cause bias. This is especially problematic for subjective outcomes (Priyono, Moin and Putri, 2020).

Time can be an issue, too. If the study lasts only a short time, it might not pick up on long-term effects or see how participant outcomes change, considering a limited understanding of the actual impacts of the intervention (Sciancalepore and Zannone, 2022).

Different results due to varying research tools: Different research methods can confuse direct comparisons. This can make it hard to combine data (Sjödin *et al.*, 2020).

Literature Gaps

Few studies on certain groups: Rare research exists on particular groups like those with specific neurological conditions or levels of mobility issues. Overlooked influence of environment: The effect of features such as the kind of landscape or whether indoors or outdoors may not be considered in existing studies (El-Hakiem Abd El-Nabie, Abd El Aziz and Elshennawy, 2019).

Section 3: Review Conclusion

To conclude, this review summarises the main findings and how they relate to the new research question. This cross-reference strengthens arguments for comparing a modern versus traditional walking frame's effect on walking and turning times.

From what has been found, walking aids significantly help improve movement and steadiness for people with differing levels of walking ability. The pros and cons found in the reviews highlight areas needing more study. High-quality research designs will explain interview specifics, and ample sample sizes boost the study findings' reliability. That said, future studies should investigate potential bias due to insufficient blinding and short follow-up periods.

Moreover, the literature reveals some holes, emphasizing the necessity of targeted research, especially in understanding how walking impacts certain patient groups and considering the environment. They need to be evaluated in coming studies for a comprehensive understanding of the effectiveness of walking aids. This study aims to enhance mobility therapy for those with movement struggles. This is done by timing the completion of daily tasks with average and distinctive walking frames.

Reference List

Bocken, N. *et al.* (2019) 'A review and evaluation of circular business model innovation tools', *Sustainability (Switzerland)*. MDPI. Available at: https://doi.org/10.3390/su11082210.

El-Hakiem Abd El-Nabie, W.A., Abd El Aziz, H.G. and Elshennawy, S. (2019) 'Effect of walking aids and foot orthoses on energy expenditure in children with cerebral palsy: a systematic review', *Bulletin of Faculty of Physical Therapy*, 24(2), pp. 99–112. Available at: https://doi.org/10.4103/bfpt.bfpt_3_19.

Hersh, M. (2022) 'Wearable Travel Aids for Blind and Partially Sighted People: A Review with a Focus on Design Issues', *Sensors*. MDPI. Available at: https://doi.org/10.3390/s22145454.

Huang, S.W. and Chang, T.Y. (2020) 'Social Image Impacting Attitudes of Middle-Aged and Elderly People toward the Usage of Walking Aids: An Empirical Investigation in Taiwan', *Healthcare*, 8(4), pp. 1–20. Available at: https://doi.org/10.3390/healthcare8040543.

Lindh-Rengifo, M. *et al.* (2021) 'Perceived walking difficulties in Parkinson's disease – predictors and changes over time', *BMC Geriatrics*, 21(1). Available at: https://doi.org/10.1186/s12877-021-02113-0.

Lüdeke-Freund, F., Gold, S. and Bocken, N.M.P. (2019) 'A Review and Typology of Circular Economy Business Model Patterns', *Journal of Industrial Ecology*. Blackwell Publishing, pp. 36–61. Available at: https://doi.org/10.1111/jiec.12763.

Ma, K. *et al.* (2020) 'Structural design and motion simulation of walking aid', in *Journal of Physics: Conference Series*. Institute of Physics Publishing. Available at: https://doi.org/10.1088/1742-6596/1570/1/012031.

McDonald, R.M. and Eisenhardt, K.M. (2020) 'Parallel Play: Startups, Nascent Markets, and Effective Business-model Design', *Administrative Science Quarterly*, 65(2), pp. 483–523. Available at: https://doi.org/10.1177/0001839219852349.

Minion, J.T. *et al.* (2021) 'PICO Portal', *Journal of the Canadian Health Libraries Association*. Canadian Health Libraries Association, pp. 181–183. Available at: https://doi.org/10.29173/JCHLA29590.

Morkunas, V.J., Paschen, J. and Boon, E. (2019) 'How blockchain technologies impact your business model', *Business Horizons*, 62(3), pp. 295–306. Available at: https://doi.org/10.1016/j.bushor.2019.01.009.

Priyono, A., Moin, A. and Putri, V.N.A.O. (2020) 'Identifying digital transformation paths in the business model of smes during the covid-19 pandemic', *Journal of Open Innovation: Technology, Market, and Complexity*, 6(4), pp. 1–22. Available at: https://doi.org/10.3390/joitmc6040104.

Rahman, K.S. and Thelen, K. (2019) 'The rise of the platform business model and the transformation of twenty-first-century capitalism', *Politics and Society*, 47(2), pp. 177–204. Available at: https://doi.org/10.1177/0032329219838932.

Rianmora, S. and Poulpanich, K. (2022) 'Concept Development in a Walking Assistive Device: Offset Handle With a Small Base Area', *International Journal of Knowledge and Systems Science*, 13(1). Available at: https://doi.org/10.4018/IJKSS.306259.

Sciancalepore, S. and Zannone, N. (2022) 'PICO: Privacy-Preserving Access Control in IoT Scenarios through Incomplete Information', in *Proceedings of the ACM Symposium on Applied Computing*. Association for Computing Machinery, pp. 147–156. Available at: https://doi.org/10.1145/3477314.3508379.

Sjödin, D. *et al.* (2020) 'Value Creation and Value Capture Alignment in Business Model Innovation: A Process View on Outcome-Based Business Models', *Journal of Product Innovation Management*, 37(2), pp. 158–183. Available at: https://doi.org/10.1111/jpim.12516.

Tijjani, I., Kumar, S. and Boukheddimi, M. (2022) 'A Survey on Design and Control of Lower Extremity Exoskeletons for Bipedal Walking', *Applied Sciences (Switzerland)*, 12(5). Available at: https://doi.org/10.3390/app12052395.