

A scoping review on methods for assessing product comfort: considerations for footwear comfort

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Introduction

In footwear research, footwear comfort has become an increasingly popular topic. Commonly used assessment tools include the visual analogue scale, the Likert scale and self-reported ranking (Lindorfer et al., 2018). Data collection methods for footwear comfort often focus on participants' interactions with footwear, and tasks performed. However, existing literature on product comfort suggests that comfort is not only influenced by external physical factors. In a review on theoretical product comfort models by Vink and Hallbeck (2012), comfort has been defined as '*pleasant state or relaxed feeling of a human being in reaction to its environment*'. The review further explains that each individual experiences comfort differently based on various internal (e.g. sensation, emotions, expectations) and external (e.g. features of product, tasks performed, environment) factors. Perception of comfort is a complex subject, yet many commonly used assessment methods are often simplified and unable to encapsulate this complexity.

Purpose of the study

The purpose of this scoping review was to explore current methods in assessing product comfort. The considerations for footwear comfort will be explored in this presentation.

Methods

This scoping review followed the framework of Levac et al. (2010). Studies were included if they included assessment of product comfort or discomfort or both. Studies were excluded if they only related to psychological comfort, visual and hearing comfort, eyes, mouth or internal organs, injection, sedation, surgical or invasive procedures, being performed when participants are unconscious, and in participants with cognitive impairments or receiving palliative care.

The articles were reviewed, and data was extracted in the topics relevant to their potential influences on the quality of the comfort assessment. The characteristics extracted from the included studies were related to the following topics: 1) product information 2) methods of assessing comfort 3) characteristics of comfort assessment tools used, and 4) participant characteristics. The studies were also separated into two categories of products: non-wearable and wearable products. When a study referenced a comfort / discomfort assessment tool within their methods, the literature was also further investigated for their validity and reliability.

Results

In this scoping review, 15 studies were found to be investigating foot orthoses and/or footwear. Only 11 out of 106 studies used a validated tool or was a validation study, one of which was a foot orthoses study.

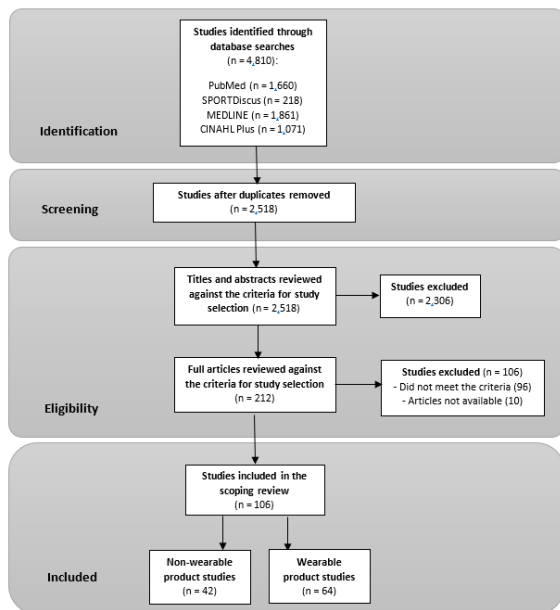


Figure 1. Flow diagram of the identification and study selection processes.

The validated tools found in the included studies were Quebec User Evaluation of Satisfaction with assistive Technology (QUEST) and its translated versions, Wheelchair Seating Discomfort Assessment Tool (WcS-DAT), Socket Comfort Score (SCS), Comprehensive lower-limb amputee socket survey (CLASS), Trinity Amputations and Prosthetic Experience Satisfaction Scale (TAPES), Prosthetic Evaluation Questionnaire (PEQ), and The Nordic Musculoskeletal Questionnaire (NMQ).

Discussion and conclusion

The validated tools found within this review were related to assistive devices and prosthetics, suggesting the advancement in product comfort assessment in this area of healthcare research. The validated tools include questions and statements on topics such as sensations, emotions, beliefs, habits, social influences, product features, product usability, activities, and detailed areas of comfort/discomfort as part of their evaluation of comfort/discomfort perceptions. All of which could be adapted for footwear comfort research.

The current lack of validated tools and standardised protocols in footwear comfort assessment could result in data not providing a holistic overview of the perceived comfort experienced by the users and difficulty in comparing data between different research studies even for the same product. Good practice learned from different disciplines can be applied in future development of footwear comfort assessment tools and protocols.

References

- Levac, D., Colquhoun, H., & O'Brien, K.K. (2010). Scoping studies: Advancing the methodology. *Implementation Science*, 5, 69.
- Lindorfer, J., Kröll, J., & Schwameder, H., (2018) Comfort assessment of running footwear: Does assessment type affect inter-session reliability? *European Journal of Sport Science*, 19, 177–185.
- Vink, P., & Hallbeck, S. (2012). Editorial: Comfort and discomfort studies demonstrate the need for a new model. *Applied Ergonomics*, 43, 271–2