

**UNIVERSITI TEKNOLOGI MARA**

**CHARACTERIZING PRODUCT  
PERFORMANCE PHOTOGRAPHY  
AS VISUAL IMAGING THAT  
INFLUENCES DESIGNER  
THINKING IN USER-CENTRED  
REHABILITATION PRODUCT  
DEVELOPMENT**

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## ABSTRACT

User-centred design in rehabilitation often struggles to translate patient experiences into meaningful design insights. This study addresses that gap by characterizing Product Performance Photography (PPP) as a visual imaging method that influences designer thinking in rehabilitation product development. Grounded in Design Thinking theory, the research explores how visual data can enhance empathy, cognition and ideation among designers engaged in rethinking assistive hand splints for stroke patients. A qualitative multi-method approach was employed, combining three interrelated phases: (i) content analysis of scholarly sources to identify key dimensions of patient experience (PEX); (ii) Product Performance Photography to visually capture real-life interactions between patients and their hand splints; and (iii) Verbal Protocol Analysis (VPA) with designers to examine how these visual cues shaped their reflective reasoning and design decisions. Data were analysed thematically using MAXQDA to reveal recurring patterns of empathy, perception and design response. Findings demonstrate that PPP functions through referential, communicative and aesthetic dimensions, enabling designers to understand patient challenges such as discomfort, stiffness and emotional frustration. The visual data fostered empathetic reflection and inspired adaptive redesign ideas, including softer materials, adjustable wrist joints and easier fastening mechanisms. The study contributes a visual design framework that positions PPP as a mediating artefact within the early stages of Design Thinking (Empathise - Define - Ideate). By foregrounding authentic visual data, PPP transforms photography from passive documentation into an active cognitive tool that drives empathy-based innovation. The research extends beyond the technical domain of product design, highlighting the broader relevance of visual inquiry for healthcare innovation, interdisciplinary design and inclusive creative practice.

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# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

Design has long been recognized as a powerful tool for improving lives, particularly in the realm of healthcare. The significance of thoughtful design extends beyond mere aesthetics; it encompasses the creation of solutions that enhance functionality, accessibility and overall user experience. In healthcare, where the stakes are often life-altering, the role of design becomes even more critical. Effective design can lead to better patient outcomes, increased satisfaction and a more efficient healthcare delivery system. The integration of user-centred design (UCD) principles has revolutionized product development across various industries, including healthcare. UCD is defined as an iterative design process that actively involves users at every stage, from ideation to prototyping and testing. By prioritizing the needs, preferences and behaviours of users, designers can create products that not only meet clinical requirements but also resonate with the end-users' experiences.

Research has shown that UCD yields significant benefits, including improved usability, higher adoption rates and enhanced user satisfaction (Gualandi et al., 2019; Olmsted-Hawala et al., 2010). In healthcare, UCD has led to the development of innovative solutions that address specific patient needs, streamline workflows for healthcare providers and ultimately improve the quality of care. For instance, the design of medical devices, hospital environments and rehabilitation tools has increasingly incorporated user feedback, resulting in products that are more intuitive and effective (Blyth et al., 2012; Carmel-Gilfilen, 2011). As healthcare continues to evolve, the need for empathetic and user-centred design remains paramount, ensuring that the voices of patients and providers are heard and integrated into the design process.

The determinants of design factors in design studies are of long-term interest to researchers and practitioners because effective design requires a deep understanding of the user. While the use of product photos has been extensively studied in consumer contexts, its potential role in mediating design processes, especially in rehabilitation product development, remains underexplored (Cross, 2018; Dorta et al., 2020). This research seeks to bridge this gap by leveraging product performance photography for