

SYNOPSIS

The skin, the largest organ of the human body, and more specific post burn scars are the topic of this thesis. A burn injury is a traumatic event followed by a variety of interventions from acute care to multidisciplinary aftercare. Physical therapy for scars is a relatively new treatment modality, lacking knowledge amongst health care practitioners and evidence based therapy.

This thesis focusses on the post-burn dysfunctioning of patients with hypertrophic scars and used the International Classification of Functioning Disability and Health (ICF) framework to describe the different assessment tools and questionnaires. The general Introduction of this thesis illustrates the ICF with the different domains (Body Structures/Body Function, Activity, Participation) as well as the broad impact of post burn scars on patients. The different assessment measures and the physical treatments are introduced.

The quality of various ways to evaluate burn scars were addressed in Part 1 of this thesis. Four chapters are included. The first chapter elaborates on the reliability of the Semmes Weinstein monofilament test (SWMT) with the 'Ascending Descending' method to assess the touch pressure threshold in burn scars. Both interrater and intrarater reliability was shown for upper extremities burn scars and healthy subjects. Chapter 2 is a study investigating both reliability and validity of a dual assessment tool to measure TEWL and colour. The Scarbase Duo® a new, compact and affordable device was shown to be valid and reliable for repeated measures and between 2 raters. In the third chapter the most frequently used Health Related Quality of Life questionnaires were sought. The Burn Specific Health Scale-Brief (BSHS-B), the Short Form-36 items and the European Quality of Life 5 Dimensions (EQ-5D) were by the content of their subscales classified within the ICF framework. Overlaps and gaps were explored and revealed that the BSHS-B covered most ICF domains, had 5 unique subscales and was the only to include Personal Factors. The SF-36 had one unique subscale and none of the measures addressed contextual factors. This theoretical exercise was empirically evaluated in Chapter 4 with a prospective multicentre study. High convergence was shown between the generic measures (EQ-5D and SF-36). The EQ-5D and the SF-36 showed better discriminant validity than the BSHS-B across burn severity groups defined by the number of surgeries. This study illustrated that a short generic scale can provide interesting information but should be combined with a more comprehensive condition-specific scale in order to capture the full impact. Overall, this study supports the view that currently the most frequently used scales to measure functioning fall short to measure the full impact of a burn injury.

Part 2 of this thesis elaborated on the effects of vacuum massage on Body Structures and Body Functions. In Chapter 5 a comparative study between a usual care group and an intervention group receiving vacuum massage investigated the effects on pain, itch and TPT. Between-group analyses revealed no statistically significant differences between the groups over time. Within-group analysis for pain revealed a statistically significant improvement over time for both groups. A significant improvement for TPT was found in the intervention group, for itch the usual care group showed a statistically significant improvement. The short-term effects on Body structures; epidermal and dermal thickness and density assessed with high-frequency ultrasound scanning, were investigated in Chapter 6. Moreover the possible role of vacuum massage as a form of mechanotherapy was described. Significant changes in the epidermal density were found immediately after application and dermal density decreased after application and was still present after two hours. The results suggest that this the vacuum massage may lead to dermal extracellular matrix remodelling.

This thesis illustrated the use of the ICF to evaluate the content of Patient Reported Outcome Measures and advocates its use in post burn clinical evaluations and within research. The effects of vacuum massage (and manual therapy) on burn scars and scars in general is an issue still under debate. The effects of vacuum massage on quality of life and other scar characteristics such as elasticity requires further research. Despite its exploratory nature, this study offers some insights into mechanotherapy within physical therapy modalities. The findings of this thesis have a number of important implications for future practice and research in post burn aftercare.