

# Passive Hydrotherapy WATSU® for Rehabilitation of an Accident Survivor: A Prospective Case Report

Agnes M. Schitter<sup>a</sup> Johannes Fleckenstein<sup>a,b</sup>

<sup>a</sup>Institute of Complementary Medicine IKOM, University of Bern, Bern, Switzerland;

<sup>b</sup>Department of Sports Medicine, Institute of Sports Medicine, Goethe-University Frankfurt, Frankfurt/M., Germany

## Keywords

Hip fractures · Pelvis · Mind-body therapies · Pain management · Stress disorders, post-traumatic · Psychosomatic medicine · Aquatic therapy · Aquatic bodywork · Relaxation

## Summary

**Background:** WaterShiatsu (WATSU) is a passive form of hydrotherapy in warm water (35 °C) that aims at relaxation, pain relief, and a sense of security. This case report focuses on a patient's experience of integrating WATSU into her rehabilitative care. **Case Report:** A 52-year-old woman survived a severe motorcycle accident in which she sustained several fractures on the right side of her body, including ribs, the pelvis, and the femur. After discharge from stationary care, she independently scheduled 8 weekly WATSU sessions with an experienced WATSU therapist also trained in physiotherapy and psychosomatics. Quantitative and qualitative data obtained from the patient's diary and the therapist's notes is presented. **Results:** The patient associated WATSU with physical and emotional release, reconciliation with her body, and trunk mobilization (followed by ameliorated breath). She ascribed WATSU lasting effects on her body image and reported continuous improvement by the Patient-Specific Functional Scale. The therapist employed WATSU to equalize awareness throughout the body and for careful mobilization. Due to complications (elevated inflammation markers), only 6 of 8 scheduled sessions were administered. **Conclusions:** WATSU was experienced as helpful in approaching a condition that the patient felt insufficiently covered by conventional physiotherapy alone. In early rehabilitation, additional medical/physiotherapeutic skills of contributing complementary therapists are advocated.

© 2018 S. Karger GmbH, Freiburg

## Schlüsselwörter

Beckenringfrakturen · Mind-Body-Therapien · Schmerz · Posttraumatische Belastungsstörung · Psychosomatik · Hydrotherapie · Aquatische Körperarbeit · Entspannung

## Zusammenfassung

**Hintergrund:** WasserShiatsu (WATSU) ist eine passive Hydrotherapieform in warmem Wasser (35 °C), die Entspannung, Schmerzreduktion und Geborgenheit zu vermitteln sucht. Im vorliegenden Fallbericht wird darauf fokussiert, wie eine Patientin WATSU im Rahmen ihrer Rehabilitation erlebte. **Fallbericht:** Bei einem Motorradunfall erlitt eine 52-jährige Frau schwere Verletzungen, unter anderem zahlreiche Brüche an Rippen, Beckenring und Oberschenkelknochen. Nach der stationären Betreuung ergänzte sie ihre Rehabilitation um 8 WATSU-Sitzungen bei einer erfahrenen Physiotherapeutin, die auch über körperpsychotherapeutische Kompetenzen verfügt. Quantitative wie qualitative Inhalte aus ihrem Tagebuch und den Unterlagen der Therapeutin werden berichtet. **Ergebnisse:** Die Patientin verband die Auflösung emotionaler und körperlicher Spannungszustände, die Versöhnung mit ihrem Körper und erleichterte Atmung (infolge Rumpfmobilisation) mit WATSU. Sie schrieb WATSU dauerhafte Veränderungen ihres Körperschemas zu und berichtete in der «Patient-Specific Functional Scale» kontinuierliche Fortschritte bei als schwierig empfundenen Alltagsaktivitäten. Die Therapeutin nutzte WATSU, um die Aufmerksamkeit auf den Körper in seiner Gesamtheit zu lenken und zur Applikation sanfter Mobilisationen. Infolge von Entzündungsanzeichen konnten nur 6 der 8 geplanten Sitzungen durchgeführt werden. **Schlussfolgerungen:** WATSU wurde von der Patientin in einer Situation, in der sie sich durch konventionelle physiotherapeutische Maßnahmen unzureichend begleitet fühlte, als hilfreiche Unterstützung empfunden. In frühen Stadien der Rehabilitation sind medizinische/physiotherapeutische Kenntnisse von behandelnden Komplementärtherapeutinnen angezeigt.

## Introduction

Therapies of complementary and alternative medicine (CAM) are gaining popularity [1, 2] and are being used alongside conventional healthcare efforts in pain conditions [3, 4].

This case report is the first to depict how passive hydrotherapy – WaterShiatsu (WATSU), a complementary therapy – was added to a rehabilitative process independently by a patient after a severe motorcycle accident. During WATSU, a therapist uses the forearms and hands to support and move the immersed patient and to stimulate Shiatsu acupressure points. In addition, the buoyancy and turbulences of the water are acting on the patient's body. Reportedly, WATSU was introduced in programs that search to address stress [5, 6], anxiety [7], symptoms of depression [6–8], posttraumatic stress disorder [7, 9], and pain [5, 7, 10, 11], and to foster awareness [5, 8, 12]. The purpose of this case report is to depict the gains and challenges in the use of this complementary therapy during outpatient rehabilitation.

## Methods

This report follows adaptations of the CARE Guidelines [13] for therapeutic massage and bodywork publications [14]. Informed consent was obtained from the patient, the persons starring in the demo videos, and all individuals mentioned in the acknowledgements. According to Swiss regulations, the term 'research' applies to 'method-driven search for generalizable knowledge' only (Human Research Act (HRA), chapter 1, section 1, article 3a) [15]. A physiotherapeutic case report does not meet this definition; hence, the notionally concerned ethics committee in written form declared itself not competent to express its approval and waived further assessment.

## Case Report

### Patient Descriptors

A Swiss nursery school teacher (female, 52 years, 178 cm, 63 kg, no children) rode as a passenger on a motorcycle when it was hit by another vehicle. The accident caused multiple fractures on the right side of her body including the femur (displaced medial femoral neck fracture with fracture through the posterior part of the femoral head, and AO-type C2 distal fracture), the acetabulum (T-type fracture with central protrusion of the femoral head), and the ribs II–X (with pneumothorax and hemorrhage into the right lung). As this happened during a holiday in Norway, she was initially brought to a hospital near the site of the accident but from there transferred straight to Oslo University Hospital for orthopedic surgery. The fragmented distal femur and the pelvis were fixed by plates, while the acetabulum and proximal femur were replaced with a total hip arthroplasty. The fractures of the thorax were treated conservatively. Five days after the accident, she was repatriated to Switzerland, together with her husband who was injured in this accident as well. Following a couple of weeks at the hospital and almost 1 month in a rehabilitation center, she started an intensive rehabilitative outpatient program. It initially contained physiotherapy 2–3 times a week, as prescribed by the surgeon who provided aftercare, and autonomously added WATSU on a weekly basis. From week 13 post accident onwards, the patient also chose to utilize monthly osteopathic consultations.

### Complications

During recovery, elevated inflammation markers occurred recurrently without detectable cause. An overlooked Baker's cyst in the right leg ruptured

4 months after the accident and had to be intervened surgically. A timeline illustrating the first half-year after the accident is given in Online Supplemental Figure 1 (Online Supplemental Material; [www.karger.com/?DOI=487768](http://www.karger.com/?DOI=487768)).

### Personal History

During adolescence the patient suffered 6 years of sexual abuse and she experienced several potentially traumatizing events as an adult – amongst other things, 2 motor vehicle accidents. Her lungs had to be glued due to an alpha-1-antitrypsin deficiency in 2006, and her husband sustained an ischemic stroke in 2009, from which he recovered well.

She stated to have known and applied CAM therapies before the current event, namely, massages, kinesiology, Aura-Soma (a form of chromotherapy), WATSU, and osteopathy (which she had occasionally utilized in search for pain relief and improved articular function).

### Clinical Findings

#### Psychological Aspects

At the beginning of the outpatient rehabilitative interventions, the patient reported signs of posttraumatic stress: intrusive thoughts (nightmares, flashbacks), vegetative reactions, and elevated arousal (sleep disturbances, disproportionate vigilance, and jumpiness). She stated that she had been afraid to die during the accident and described amnesia concerning the 3 days following the accident. Her optimism regarding her future was diminished. In addition, she was worried about her husband's condition.

#### Physical Aspects

The patient started WATSU when she was discharged from stationary care, with the allowance to bear 15 kg of weight on her injured leg and with no allowance to adduct the injured hip or to abduct it against resistance. Flexion of both hip and knee was allowed up to 90°. When standing upright, the patient kept her right hip in flexion for relief, thus causing excessive lordosis in the lower back.

Superficial sensation was diminished in the lateral portion of the knee; the distal thigh and knee were swollen. The movability of the skin was reduced in the injured areas, with the scars being least flexible and most adherent and painful around the distal thigh and the abdomen.

The patient reported constant pain in the affected regions (numeric rating scale 2–4 out of 10), which in the upper part of the body caused respiratory compromise and limited walking with crutches.

### Treatment Hypotheses

A life-threatening event upon several potentially pre-traumatizing incidents resulted in a stressful state, implicating considerable suffering and fear for the patient. At the same time multiple injuries on the right side of her body led to severe muscular imbalances across the body and the patient had begun to develop a distorted body scheme.

Accordingly, the treatment objectives were

- *Emotional*: Stress regulation (enhancement of resources, facilitation of homeostasis)
- *Mental*: Equalization of perception and bearing of the two sides of the body; restoration of confidence in the affected areas
- *Physical*: Increase of the range of motion and function (e.g. ameliorated breath), pain reduction

### Rationales Regarding WATSU

- Regulation of stress by providing the patient with an environment that feels thoroughly 'safe': being held and treated gently [8–10]
- Equalization of the 2 sides of the body by application of symmetrical 3-dimensional movements, and training of body perception and awareness by exertion of plenty of sensory input [16]
- Increase of the range of motion (as permitted) and function by (a) mobilization of scars and tissues, (b) reduction of swelling (hydrostatic pressure might reduce swelling, but warmth might increase it, caution!), and (c) reduction of pain by warmth, relaxation, possibly by activation of C-

tactile fibers due to current [17, 18] and activation of A-fibers by massage and changes in the temperature between water and air (Gate Control Theory [19]).

#### Assessment Measures

##### Quantitatively

At the beginning of every treatment session, the current general, emotional, mental, and physical condition was estimated by the patient using a numeric rating scale (ranging from 0 = worst to 10 = best), and changes in medication were documented. The functional progress of the patient was evaluated at the beginning of every session, employing the Patient-Specific Functional Scale (PSFS) [20].

In response to the patient referring to increased swelling of the knee at the second session, the circumference of the knee was measured before and after treatment from the next session onwards, with one measurement being taken at the middle of the patella and another one 7 cm proximal of the patella [21].

##### Qualitatively

The patient kept a diary about her rehabilitation process. The time period covering the WATSU treatments was systematically analyzed employing a qualitative and quantitative approach [22]: Narrations were first broken down into analytical units and single pieces of information were extracted. Afterwards, these pieces of information were expressed in independently comprehensible short paraphrases. A content analysis of about 50% of all analytical units was performed to extract thematic categories. The accuracy of these categories was tested by integration of the remaining items, which led to amendments in the definition of the categories and ultimate classification of all analytical units. The categories were then recapitulated to main categories. In addition, all sub- and main categories were presented as numerical information, providing numeric and absolute values of frequency. All steps of this procedure were checked for plausibility by the second author (J.F.).

The therapist kept records of the focus of each session and of special events, observations, and feedbacks, which were summarized for this report.

#### Practitioner Descriptors

The WATSU therapist in this case has been working as physiotherapist for 17 years, 6 of which she also practiced WATSU. In addition, she holds a diploma in holistic body therapy (for 6 years) and in integrative body psychotherapy (IBP, for 2 years). She runs her own physiotherapeutic practice.

#### Therapeutic Intervention

From repatriation on, the patient underwent the regular treatment regimen as it is provided by the Swiss healthcare system based on mandatory insurance. This includes fully reimbursed physiotherapy to secure optimal recovery and improvement of muscular and sensorimotor function.

WATSU – an adjunct treatment to conventional care in this case report – is a passive hydrotherapy administered in thermoneutral (35 °C/95 °F/308.15 K) water [23, 24]. The mental framework underlying WATSU is: «Being, not doing». In contrast to physiotherapeutic exercises, WATSU does not entail a patient's conscious effort, performance, or success. Instead, the therapist searches to facilitate relaxation and to provide a sense of safety by WATSU's gentle stretches and massages [23].

The application of WATSU elements takes the singularity of a patient's state into account, as e.g. the potential need for floating devices on the patient's legs for optimal comfort. A specific characteristic of the reported situation was the presence of limitations communicated by the surgeons. These limitations had to be obeyed strictly during the actual treatment, but also during transfers in and out of the pool. To closely monitor the hip position while moving an entire body 3-dimensionally is a delicate and challenging task. In a demo video available at <https://boris.unibe.ch/92748/> it can be seen how slow movements in this position cause the hips neither to abduct nor to adduct (whereas quick ones will). Therefore, additional training in physiotherapy was indispensable for the assigned WATSU therapist.

#### Intervention Administration

Eight treatment sessions were scheduled on a weekly basis over 2 months. Each session lasted 60 min; an additional 15 min were provided for preliminary talk, feedback, conjoint definition of the focus and scope of each session, and for measurements; another 15 min for feedback, integrational conversation, and measurements after the session. The therapist used this extra time also for gait training in the water, to foster awareness, for guided visualization, and to recommend self-care exercises as homework.

## Results

#### Quantitative Outcomes

Of the 8 scheduled WATSU sessions, 6 were delivered. Sessions 2 and 3 were cancelled by the patient in agreement with her physician due to elevated inflammation markers.

The self-estimated general, emotional, mental, and physical conditions, as reported at the beginning of each session, continuously improved while the reported medication intake decreased and the patient continuously progressed in most functional areas that she had defined as difficult in the PSFS. No systematic changes of the swelling of the knee were observed (Online Supplemental Table 1, Online Supplemental Material; [www.karger.com/?DOI=487768](http://www.karger.com/?DOI=487768)).

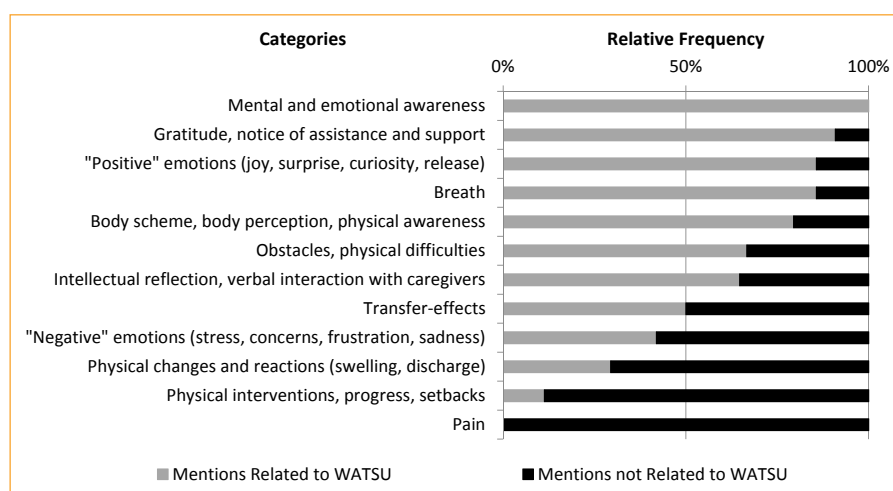
#### Qualitative Outcomes

##### The Patient's Diary

The patient's diary of the concerned time frame contained information concerning the WATSU sessions and observations related to them (expectations, transfer effects; in total, 186 mentions) as well as information concerning physiotherapeutic and osteopathic treatments, other medical interventions, the overall progress during the week, and events that were of specific significance to the patient (in total, 149 mentions). Results from the analysis of qualitative data on the patient's description of her experiences, subdivided according to their content into the categories (1) emotional aspects, (2) mental aspects, and (3) physical aspects are presented in Online Supplemental Table 2 (Online Supplemental Material; [www.karger.com/?DOI=487768](http://www.karger.com/?DOI=487768)). The relative frequencies of all categories derived from the patient's diary are presented in figure 1.

With respect to WATSU, the patient's notes centered around emotional release, reconciliation with her body, and trunk mobilization (followed by ameliorated breath). She mentioned that WATSU added a certain quality of secureness to her rehabilitation experience and helped her to shift focus from problems and paresthesia to positive emotions and pleasant body perceptions, e.g. by re-introducing the experience of unimpeded motion and relaxation. As a result, she ascribed WATSU lasting beneficial effects on her body image. Notes not related to WATSU mainly described the daily progress and setbacks, and the duration and intensity of trainings/interventions. Reflection of the treatments based on the notes of the therapist and comments from the patient diary containing crucial additional information are summarized in Online Supplemental Table 3 (Online Supplemental Material; [www.karger.com/?DOI=487768](http://www.karger.com/?DOI=487768)).

**Fig. 1.** What did the complementary therapy add? Relative frequencies of all categories derived from the patient's diary.



### The Therapist's Notes

The therapist kept record of the focus of each session and of special events, observations, and feedbacks. Positions mentioned in Online Supplemental Table 3 are illustrated in part in demo videos. (Please follow the links in Online Supplemental Table 3. Note: The person treated in the videos is not the patient of the reported case and therefore presents with full joint mobility.)

## Discussion

High-impact events as, e.g., vehicle accidents can result in severe traumata like fractures of the pelvis [25] which lead to extremely time-consuming rehabilitation processes [26, 27]. The complexity of the condition is pronounced, and even after excellent osseous restoration, patients often suffer considerable pain as well as impairments in their physical and mental quality of life [28–30]. Guidelines for the management of long-term incapacity to work suggest relaxation training (a core element of many CAM therapies – and certainly of WATSU) as one intervention [31]. While the term ‘complementary therapy’ leaves a notion of ‘additional costs’, analyses of registries indicate that integrating such approaches in the management of long-term pain can introduce a continued reduction in drug prescription/consumption, in contrast to observed increases under conventional medicine alone [32]. This stands in line with registry analyses concluding that doctors who are additionally trained in CAM produce similar health outcomes at lower costs [33, 34]. Accordingly, the World Health Organization prompts governments to support and facilitate research and to implement complementary and traditional medicine into conventional medical routines [35, 36]. However, in the illustrated case, osteopathy was only partially reimbursed and WATSU was a full out-of-pocket expense.

Like many users of CAM therapies, the patient in this case report was female and had already been exposed to CAM treatment modalities before the current event [3]. When she suffered considerable trepidation and musculoskeletal pain, she recollected the properties of WATSU and resorted to it. Over the course of the re-

ported weeks, her condition improved continuously (Online Supplemental Tables 1 and 3, Online Supplemental Material; [www.karger.com/?DOI=487768](http://www.karger.com/?DOI=487768)). Considering her traumatic history and the distress she presented with at the beginning of her outpatient rehabilitation, the patient was originally at risk of an unfavorable rehabilitation course [37–39]. Given the multimodal setting and the singularity of this case, it remains unclear whether some of this success can be attributed to WATSU. Analysis of the diary, however, revealed that in this patient's point of view conventional and complementary care addressed different aspects of her recovery. For example, the topic ‘mental and emotional awareness’ was exclusively mentioned in connection with WATSU whereas ‘pain’ was a subject never related to WATSU. In her feedback, she described WATSU as a stabilizing resource and featured its positive impact on emotional and mental states – precisely reflecting changes in perception and body image and highlighting the facilitating contribution of WATSU to emotional release and physical discharge. In contrast, her feedback unrelated to WATSU centered on physical achievements and performance in a rather mechanistic and functional context and diction. This allows for the conclusion that this patient experienced WATSU as what it really considers itself to be: complementary.

The therapist delivering WATSU was a trained physiotherapist and as such capable of fully capitalizing on the beneficial effects of immersion on pain perception, tonicity and joint loading [40] while continuously observing the allowed range of motion in the affected joints – a task by which a regular therapist might be overtaxed. She was also alert towards signs of inflammation and competent to advise the patient on how to proceed when they augmented. Due to the generous time frame of a WATSU setting and the extensive training of its providers, traumatic emotional contents – which regularly occur in the aftermath of severe physical trauma [37] – can be processed in a constructive spirit, as was exemplified in this case. Technically, aquatic exercise could have been part of this patient's regular physiotherapy during rehabilitation [40]; however, the lack of a hydrotherapy pool, open wounds that cannot be covered, or – as in this case – elevated inflammation markers can easily impede this.

## Limitations

This case report depicts a current real-life scenario. The therapist chose parameters and interventions according to her expertise. Since CAM therapists are following the salutogenic model, they search to enhance their clients'/patients' capacity for – and perception of – self-efficacy by focusing on resources rather than (potential) problems and limitations [41]. Thorough devotion to this approach might have influenced this therapist's decision to define reduction of physical pain as a goal, yet not to choose pain as an explicit parameter – which would entail assessing it systematically and making it a regular issue at every encounter.

Successful cooperation between complementary and conventional medicine is not yet the 'new conventional': neither did the WATSU provider communicate directly with other contributors in this outpatient setting nor could notes concerning this case be retrieved from the other involved medical staff with hindsight.

In her diary, the patient noted down whatever she estimated noteworthy. Therefore, her personal perception is thoroughly reflected; however, structured questionnaires might have led to different findings.

In this sense, this case report offers a unique perspective, focusing on psychological/behavioral aspects of patient care and management. Here, the CAM intervention WATSU was experienced as helpful in approaching a condition that is difficult to address by conventional physiotherapy alone [42]. In early rehabilitation, additional medical/physiotherapeutic skills of contributing complementary therapists are advocated.

## References

- 1 Eardley S, Bishop FL, Prescott P, Cardini F, Brinkhaus B, Santos-Rey K, Vas J, von Ammon K, Hegyi G, Dragan S, Uehleke B, Fonnebo V, Lewith G: A systematic literature review of complementary and alternative medicine prevalence in EU. *Forsch Komplementmed* 2012;19(suppl 2):18–28.
- 2 Clarke TC, Black LI, Stussman BJ, Barnes PM, Nahin RL: Trends in the use of complementary health approaches among adults: United States, 2002–2012. *Natl Health Stat Report* 2015;79:1–16.
- 3 Murthy V, Sibbritt D, Adams J: An integrative review of complementary and alternative medicine use for back pain: a focus on prevalence, reasons for use, influential factors, self-perceived effectiveness and communication. *Spine J* 2015;15:1870–1883.
- 4 Adams J, Andrews G, Barnes J, Broom A, Magin P: *Traditional, Complementary and Integrative Medicine: An International Reader*. Basingstoke, Palgrave Macmillan, 2012.
- 5 Schitter AM, Nedeljkovic M, Baur H, Fleckenstein J, Raio L: Effects of passive hydrotherapy WATSU (WaterShiatsu) in the third trimester of pregnancy: results of a controlled pilot study. *Evid Based Complement Alternat Med* 2015;2015:437650.
- 6 Zimmermann F: Mindfulness-based practices as a resource for health and well-being. *Med Acupunct* 2015; 27:349–359.
- 7 Smeeding SJ, Bradshaw DH, Kumpfer K, Trevithick S, Stoddard GJ: Outcome evaluation of the Veterans Affairs Salt Lake City Integrative Health Clinic for chronic pain and stress-related depression, anxiety, and post-traumatic stress disorder. *J Altern Complement Med* 2010;16:823–835.
- 8 Maczkowiak S, Hölter G, Otten H: WATSU – The effect of differently accentuated movement therapy interventions on clinically depressive patients (WATSU – Zur Wirksamkeit unterschiedlich akzentuierter bewegungstherapeutischer Interventionen bei klinisch depressiven Patienten). *Bewegungstherapie Gesundheits-sport* 2007;23:58–64.
- 9 Scaer R: *The Body Bears the Burden: Trauma, Dissociation, and Disease*. New York, Routledge, 2014.
- 10 Faull K: A pilot study of the comparative effectiveness of two water-based treatments for fibromyalgia syndrome: WATSU and AIX massage. *J Bodyw Mov Ther* 2005;9:202–210.
- 11 Gimenes RO, Santos EC, Silva TJPV: WATSU in the treatment of fibromyalgia: pilot study (WATSU no tratamento da fibromialgia: estudo piloto). *Rev Bras Reumatol* 2006;46:75–76.
- 12 Marafon G: Techniques of body mediation from alternative medicine – WATSU; in 9th Congress of the European Federation of Sexology, Rome, 2008.
- 13 Gagnier JJ, Kienle G, Altman DG, Moher D, Sox H, Riley D; the CARE Group: The CARE Guidelines: consensus-based clinical case reporting guideline development. *J Med Case Rep* 2013;7:233.
- 14 Munk N, Boulanger K: Adaptation of the CARE Guidelines for therapeutic massage and bodywork publications: efforts to improve the impact of case reports. *Int J Ther Massage Bodywork* 2014;7:32–40.
- 15 HRA: Federal Act on Research Involving Human Beings: Human Research Act. The Federal Council of Switzerland, [www.admin.ch/opc/en/classified-compilation/20061313/index.html](http://www.admin.ch/opc/en/classified-compilation/20061313/index.html), 2014.
- 16 Zimmermann Y, Hölter G, Wassink K: 'Achtsame' Körpererfahrung in der Psychomotorik. *Motorik* 2008; 31:90–101.
- 17 Bystrova K: Novel mechanism of human fetal growth regulation: a potential role of lanugo, vernix caseosa and a second tactile system of unmyelinated low-threshold C-afferents. *Med Hypotheses* 2009;72:143–146.
- 18 McGlone F, Wessberg J, Olausson H: Discriminative and affective touch: sensing and feeling. *Neuron* 2014; 82:737–755.
- 19 Melzack R, Wall PD: Pain mechanisms: a new theory. *Science* 1965;150:971–979.
- 20 Stratford P, Gill C, Westaway M, Binkley J: Assessing disability and change on individual patients: a report of a patient specific measure. *Physiother Can* 1995;47: 258–263.
- 21 Soderberg GL, Ballantyne BT, Kestel LL: Reliability of lower extremity girth measurements after anterior cruciate ligament reconstruction. *Physiother Res Int* 1996; 1:7–16.
- 22 Mayring P: *Einführung in die qualitative Sozialforschung*, ed 5. Weinheim, Beltz, 2002.
- 23 Dull H: *WATSU: Freeing the Body in Water*. Victoria, Trafford Publishing, 2004.
- 24 Craig AB, Dvorak M: Thermal regulation during water immersion. *J Appl Physiol* 1966;21:1577–1585.
- 25 Tile M: Acute pelvic fractures: I. Causation and classification. *J Am Acad Orthop Surg* 1996;4:143–151.
- 26 Gabbe BJ, Hofstee DJ, Esser M, Bucknill A, Russ MK, Cameron PA, Handley C, de Steiger RN: Functional and return to work outcomes following major trauma involving severe pelvic ring fracture. *ANZ J Surg* 2015; 85:749–754.

## Online Supplemental Material

**Online Supplemental Figure** To access the supplemental figure, please refer to [www.karger.com/?DOI=487768](http://www.karger.com/?DOI=487768).

**Online Supplemental Tables** To access the supplemental tables, please refer to [www.karger.com/?DOI=487768](http://www.karger.com/?DOI=487768).

## Acknowledgements

The authors wish to thank Krista Dick, Cristina Marti, Christian Seewald, and Christian Rothenbühler for their help in the making of the demo videos and the Swiss Institute for Aquatic Bodywork for providing free access to its in-house therapy pool.

## Funding

No funding was required to generate this article.

## Disclosure Statement

Both authors declare that they have no conflicts of interest. Until June 2016, the first author was chairwoman of the Swiss Aquatic Bodyworkers' Association and member of the supervisory board of the Swiss Institute for Aquatic Bodywork. These previous honorary engagements do not alter the author's adherence to publication ethics.

- 27 Nusser M, Holstiege J, Kaluscha R, Tepohl L, Stuby F, Roderer G, Krischak G: Return to work after fractures of the pelvis and the acetabulum (Berufliche Wiedereingliederung nach Becken- und Azetabulumfrakturen). *Z Orthop Unfall* 2015;153:282–288.
- 28 Borg T, Berg P, Fugl-Meyer K, Larsson S: Health-related quality of life and life satisfaction in patients following surgically treated pelvic ring fractures. A prospective observational study with two years follow-up. *Injury* 2010;41:400–404.
- 29 Lefavre KA, Slobogean GP, Ngai JT, Broekhuysen HM, O'Brien PJ: What outcomes are important for patients after pelvic trauma? Subjective responses and psychometric analysis of three published pelvic-specific outcome instruments. *J Orthop Trauma* 2014;28:23–27.
- 30 Morshed S, Knops S, Jurkovich GJ, Wang J, MacKenzie E, Rivara FP: The impact of trauma-center care on mortality and function following pelvic ring and acetabular injuries. *J Bone Joint Surg Am* 2015;97:265–272.
- 31 National Institute for Health and Care Excellence (NICE): Workplace health: long-term sickness absence and incapacity to work; Public Health Guideline. [www.nice.org.uk/guidance/ph19](http://www.nice.org.uk/guidance/ph19), 2009.
- 32 Sundberg T, Petzold M, Kohls N, Falkenberg T: Opposite drug prescription and cost trajectories following integrative and conventional care for pain – a case-control study. *PLoS One* 2014;9:e96717.
- 33 Baars EW, Kooreman P: A 6-year comparative economic evaluation of healthcare costs and mortality rates of Dutch patients from conventional and CAM GPs. *BMJ Open* 2014;4:e005332.
- 34 Kooreman P, Baars EW: Patients whose GP knows complementary medicine tend to have lower costs and live longer. *Eur J Health Econ* 2012;13:769–776.
- 35 World Health Organization (WHO): 'Beijing Declaration' on Traditional Medicine. [www.who.int/medicines/areas/traditional/congress/beijing\\_declaration/en/](http://www.who.int/medicines/areas/traditional/congress/beijing_declaration/en/), 2008.
- 36 World Health Organization (WHO): Executive Board and World Health Assembly Resolutions on Traditional Medicine. [www.who.int/medicines/areas/traditional/trm\\_assembly\\_doc/en/](http://www.who.int/medicines/areas/traditional/trm_assembly_doc/en/), 2014.
- 37 Vincent HK, Horodyski M, Vincent KR, Brisbane ST, Sadasivan KK: Psychological distress after orthopedic trauma: prevalence in patients and implications for rehabilitation. *PM R* 2015;7:978–989.
- 38 Lindert J, von Ehrenstein OS, Grashow R, Gal G, Braehler E, Weisskopf MG: Sexual and physical abuse in childhood is associated with depression and anxiety over the life course: systematic review and meta-analysis. *Int J Public Health* 2014;59:359–372.
- 39 Rolli Salathe C, Elfering A: A health- and resource-oriented perspective on NSLBP. *ISRN Pain* 2013;2013:640690.
- 40 Becker BE: Aquatic therapy: scientific foundations and clinical rehabilitation applications. *PM R* 2009;1:859–872.
- 41 Antonovsky A: The salutogenic perspective: toward a new view of health and illness. *Advances* 1987;4:47–55.
- 42 Synnott A, O'Keeffe M, Bunzli S, Dankaerts W, O'Sullivan P, O'Sullivan K: Physiotherapists may stigmatise or feel unprepared to treat people with low back pain and psychosocial factors that influence recovery: a systematic review. *J Physiother* 2015;61:68–76.