

Reasoning of dissertation topic and competency of potential supervisor for admission onto joint LSU and TU doctoral studies in 2019

Area of research (title and code)	
Field of research (title and code)	
Topic of research	Neurological rehabilitation
Institution	LSU

Potential supervisor

Pedagogical and scientific degree	Name, surname	Academic position
Assoc. Prof. dr.	Vilma Dudoniene	Director of physiotherapy study programme

Short reasoning of proposed dissertation topic

Title
COMPARATIVE EFFECTIVENESS OF LAND VERSUS WATER BASED EXERCISE ON FUNCTIONAL STATUS OF PATIENTS WITH NEUROLOGICAL DISORDERS
<p>Summary</p> <p><i>Background.</i> Neurological disorders (Stroke, Multiple Sclerosis, Parkinson disease) significantly affect the functional status and activities of daily living of patients. Different physiotherapy techniques (Bimanual therapy, Constraint induced movement therapy, Bobath or Motor Relearning Programme, task specific therapy, non-task exploration therapy) are applied in neuro-rehabilitation to improve patients' functioning. Aquatic therapy has been used to treat different diseases from the antique era. The aquatic environment has unique properties, such as buoyancy, turbulence, hydrostatic pressure and resistance that can be used to gain a range of exercise benefits. Buoyancy reduces body weight and helps people who have difficulties to move on land. Turbulent water can provide an environment for static and dynamic balance training with minimal risk of injury. Resistance is important for strength training in water. Aquatic therapy is applied widely in various therapeutic fields.</p> <p>Despite the widespread use of aqua therapy in rehabilitation, it is still unclear how effective it is in neuro-rehabilitation.</p> <p><i>Question 1</i> – Can motor learning in the pool be beneficial for the tasks (up and go, functional reach, gait parameters, balance, muscle strength, functional independence) performed on land?</p> <p><i>Question 2</i> – Can water provide an enriched environment and speed up the recovery?</p> <p><i>Question 3</i> – Is motor learning in the pool beneficial only for the pool tasks?</p> <p><i>Question 4</i> – Can aqua-aerobics (40-66% of HRR according to Karvonen) improve executive functions?</p> <p><i>Methods.</i> Neurological patients will be divided into two groups: Aqua therapy and Land therapy. Functional status at baseline and after different interventions (least 8 weeks of duration) will be evaluated using: Up and go test; Mini mental test; functional reach test; static and dynamic balance, muscle strength; cognitive functions, Ashworth spasticity scale, and functional independence tests.</p> <p><i>Procedures:</i> Aqua therapy will combine elements of Aqua jogging, Halliwick, Watsu, Ai chi and Bad Ragaz Ring methods.</p> <p>Land therapy will be based on functional training and exercises performed on land.</p> <p>Expected outcomes: Aqua therapy is effective in treatment of patients with neurological disorders.</p> <p><i>Lambeck J, Gamper U, Pöyhönen T, Einarsson I, Hall J, Daly D. Aquatic research muscle recruitments patterns in the bad ragaz ring method: a preliminary study. Turkish Journal of Physiotherapy and Rehabilitation 2013;24(2):S98</i></p>

Waller, B., Lambeck, J., & Daly, D. (2009). Therapeutic aquatic exercise in the treatment of low back pain: a systematic review. *Clinical rehabilitation*, 23(1), 3-14.

Lambeck, J., & Gamper, U. (2009). The halliwick concept. *Aquatic exercise for rehabilitation and training*, 45-72.

Bayraktar, D., Guclu-Gunduz, A., Yazici, G., Lambeck, J., Batur-Caglayan, H. Z., Irkeç, C., & Nazliel, B. (2013). Effects of Ai-Chi on balance, functional mobility, strength and fatigue in patients with multiple sclerosis: a pilot study. *NeuroRehabilitation*, 33(3), 431-437.

Jorgić, B., Dimitrijević, L., Lambeck, J., Aleksandrović, M., Okičić, T., & Madić, D. (2012). Effects of aquatic programs in children and adolescents with cerebral palsy: systematic review. *Sport science*, 5(2), 49-56.

Please indicate the links between the proposed topic for the doctoral thesis and health promotion / physical therapy / sports study programs.

Proposed topic is directly related to physical therapy.

Is the proposed topic for the doctoral thesis related to currently funded research projects?
No.

Is the proposed topic for the doctoral thesis related to joint research with a foreign institution?

Consultant **Johan Lambeck (Aquatic Physical Therapy International)**

Currently I am supervisor of 0 doctoral student.

Supervisor

(signature)

Vilma Dudoniene

(Name, surname)

Date 11 March, 2019