11. Solodka O. M. Aktual'ni problemi rozvitku suchasnogo informacijnogo suspil'stva / O. M. Solodka // Informacijna bezpeka ljudini, suspil'stva, derzhavi. -- 2014. -- № 1. – 21-26s.
12. Sociologija veshhej. Sbornik statej / Pod red. V. Vahshtajna. – M.: Izdatel'skij dom «Territorija budushhego», 2006. – 392s.

Pugachev D.L. Problems of formation of spirituality and self-realization of the person of teenagers in a new social paradigm. The objective of this article was to identify and assess potential threats that the new social paradigm may pose to formation of spiritual core of modern teenagers - virtualization of interpersonal communication, escape to the virtual world and the changes in the perception of familiar things through manipulation of the media and the Internet. Examples of the conscious refusal to fulfill one’s gender roles in such a technologically and economically advanced country like Japan were given. The relation to the education of children in LGBT families adopted in many countries was further criticized and assessed. The lack of common rules, when there is no clear set of criteria permissibility has been named as one of the major problems of society virtualization. That, in our opinion, greatly complicates the self-realization is in adolescence. Virtual space where permissiveness is bordered with artificial and sometimes inappropriate rules is often a difficult challenge for the formation of spirituality, because the world where there are no boundaries of what is permitted can produce an emptiness in the «self-image» of a teenager. A so-called «Overton Window» which restructures the public opinion of a whole generation of young people around the world rather immerses the formation of spirituality of a teenager in chaos than opens new perspectives for self-realization. In this perspective the article deals with targeted attack on anonymity and freedom of the Internet by the US government that impends to take total control of the personal life of every person on the planet in future.

Key words: Internet, spirituality, self-realization, gender roles, values orientations.

Liuda Radzevičienė, Vaida Aleknavičiūtė-Ablonskė,
Agnė Savenkovienė, Ilona Dobrovolskytė, Lina Miliūnienė

THE EFFECT OF HIPPOTHERAPY FOR PERSON AFTER COMA

Liuda Radzevičienė, Vaida Aleknavičiūtė-Ablonskė, Agnė Savenkovienė, Ilona Dobrovolskytė, Lina Miliūnienė. **The effect of hippotherapy for person after coma.** The present research has been based on the case study. The changes of balance in trunk muscles, body mobility were evaluated during the hippotherapy sessions. During hypotherapy activities such as touching various parts of the horse’s body (e.g. the neck, flank, back) or reaching for an object (e.g. ball or ring), which involves crossing the midline while maintaining appropriate balance and posture are performed. Positive results were set up in isometric grip strength accordingly in right and in left hands 47 and 2 % and functional mobility in 50%. We found out greater EMG of RA, EO, LT and MF muscles in right vs left side during walking, and RA, LT during riding. We presume that increased grasping muscle strength is related with the increased trunk muscle strength and increased ability to maintain upright position.

Key words: Awakening after coma, trunk muscles, functional mobility, hippotherapy

Introduction. Traumatic brain injuries in humans are known to cause a diversity of disorders involving sensorimotor, cognitive and behavioral dysfunction. The motor disabilities following traumatic brain injuries can be diverse, since the neural damage of post-traumatic brain injuries can be distributed throughout many areas of the central nervous system (Fujimoto et al., 2004; Keren et al., 2000). Motor performance can be affected by damage to various loci in the nervous system. The functional consequence may be related to a reduction in muscle strength (paresis), to sensory disturbances interrupting feedback and feed forward mechanisms, tonus disorder (spasticity), co-ordination, and motor control disorganization (Keren et al., 2000; Teasdale, 1995).

Hippotherapy is a physical therapy treatment strategy that utilizes horse's movement to achieve functional outcomes. Horses and their movement provide new possibilities of movement and cognitive functions for psychomotor skills of people. The effect of riding is multifunctional; therefore it is difficult to mark out a single effect or benefit. Benefits of hippotherapy include mobilization of the pelvis, spine, and hip joints; normalization of muscle tone and symmetry; strengthening of weak muscles; improvements in standing posture; stimulation of deep proprioception in joints; sensory integration; increased coordination; awareness of one's body in space; and normalization of movement patterns (Bracher, 2000, Sterba, 2007).

Motor disturbance in post-traumatic brain injury involve various components of the motor control system and motor recovery may be gradual and prolonged (Keren et al., 2001; Powel et al., 2002). It is clearly defined, that some functional motor improvement may only be achieved for several post injury subjects affected by the more severe traumatic brain injury. Furthermore, in stroke population, major functional improvements may be achieved during the first 3 months after injury, but for the traumatic brain injury population (especially immediate post-coma phase) the major functional improvements may be achieved only after 2 years or more, post-injury (Keren et al., 2001).

The overlap of various disciplines involved in the rehabilitation process for subjects after traumatic brain injury is widely documented. However, until recently there is still lack of evidence to confirm the effectiveness of hippotherapy to functional impairment after traumatic brain injury.

The aim of research: changes of trunk muscles electromyography (EMG), grasping force and functional mobility after hippotherapy for person after coma.

Methodology and organization of the research. All the experimental procedures were performed in accordance with the Declaration of Helsinki (1964). The subject passed the inclusion criteria into experimental: mini mental test (MMT) score higher than 20 score; the expanded disability status scale (EDSS) score lower than 6; there were no fear/allergy for horses; no epilepsy. The case study was attended by men (age 23) who underwent coma (11 days, Glasgow coma scale 9 – severe brain injury) after head trauma before 2 years with the paretic right side, they were evaluated before and after 10 procedures of hippotherapy (HT) in Šiauliai university HT centre at Kurtuvėnai regional park. During the riding session the subject was secured by physiotherapist, horse leader and side walkers, also wore a helmet and was surrounded by safety belts.

The electromyography (EMG) of the following trunk muscles was evaluated: rectus abdominis (RA), external oblique (EO), longissimus thoracis (LT), and multifidus (MF) muscles. After careful preparation of the skin (shaving, abrasing and cleaning with alcohol wipes) to obtain low impedance, bipolar sensor Ag/AgCl surface bar electrodes (DataLog type no. MVC8 USB, Biometrics Ltd, Gwent, UK) were used for EMG recording. For the RA muscle, the electrodes were placed 3 cm superior to the umbilicus. For the EO muscle, electrodes were placed midway between the anterior superior iliac spine and rib cage. For the LT muscle, the electrodes were placed 4 cm lateral to the L1 spinous process and for the lumbar MF muscles, the electrodes were placed 2 cm lateral to the lumbosacral junction (Ekstrom et al., 2007). The electrode position for each subject was marked with a waterproof pen and observed by the centimeter tape; therefore, the same recording site was used in each experiment. The ground electrode was positioned on the wrist of the left hand. EMG signals were recorded by the amplifiers (gain 100), sampled at 5kHz, band pass filtered (pass band 20-460 Hz), notch-filtered at 50 Hz using a Butterworth low-pass filter with an upper cutoff frequency of 20 Hz. The EMG signal was telemetered to a receiver that contained a differential amplifier with an input impedance of 5 MΩ. The input noise level was less than 5μV, and the common mode refection ratio was higher than 96dB. Before recording the EMG, we set the channel sensitivity at 3V and excitation output at 4600mV as recommended by the manufacturer. EMG files were stored simultaneously on the biometrics memory card and computer hardware, and dedicated software (Biometrics DataLog, Gwent, UK) was used for data processing and analysis. EMG signals were converted to the root mean square (RMS, in mV), as a measure of the physiological activity in the motor unit during contraction (Fukuda et al., 2010) EMG amplitude. To account for the occurrence of the electromechanical delay, the onset of EMG integration of the RA, EO, LT and MF muscles was set at 30 milliseconds prior to the onset of torque (Wang et al., 2011).

The EMG of rectus abdominal (RA), external oblique (EO), longissimus thoracis (LT), and multifidus (MF) muscles was measured: (1) in standing up from sitting and to sitting from standing position; (2) during walking of 10 meters' distance; (3), and during riding on horse.

In the first task the subject was asked to stand up from chair, remain standing for 10 seconds and sit down. In the second task the subject, with the support, walked 10 meters' distance, and time (sec) and steps were counted. In the third task the subject riding on horse overpassed 67 meters' distance in 35 seconds.

The isometric grip strength and symmetry of the left/right hands was measured by ERGOS II Work Simulator System (ERGOS dynamometry) (Dusik et al., 1993). During the task the subject was sitting on the chair and squeezed the grip of the device for a five second trial. A rest period of five seconds is given in between a number of three trials. The subject functional mobility was evaluated using Rivermead motor assessment gross function scale (Adams et al., 1997).

Mathematical statistics. The research data were processed employing Microsoft Excel 2010 software for mathematical statistical analysis. The data are reported as group mean values. The changes between the injury effect (left vs right side), time impact (before and after hippotherapy) were evaluated using Student's test ($p<0,05$ level of significance).

Results of the research. EMG of the trunk muscles (Fig. 1) was statistically greater in the right vs the left side in the RA, EO, MF before HT and RA, EO, LT after HT, as well as statistically lower in the right vs the left side in the LT and MF before HT.

The trunk muscles EMG was statistically greater after HT in the right side of the LT and MF muscles, also the left side of the RA, LT, MF muscles. The trunk muscles EMG was statistically lower after HT in the right side of the RA and EO muscles, also the left side of the EO muscles.

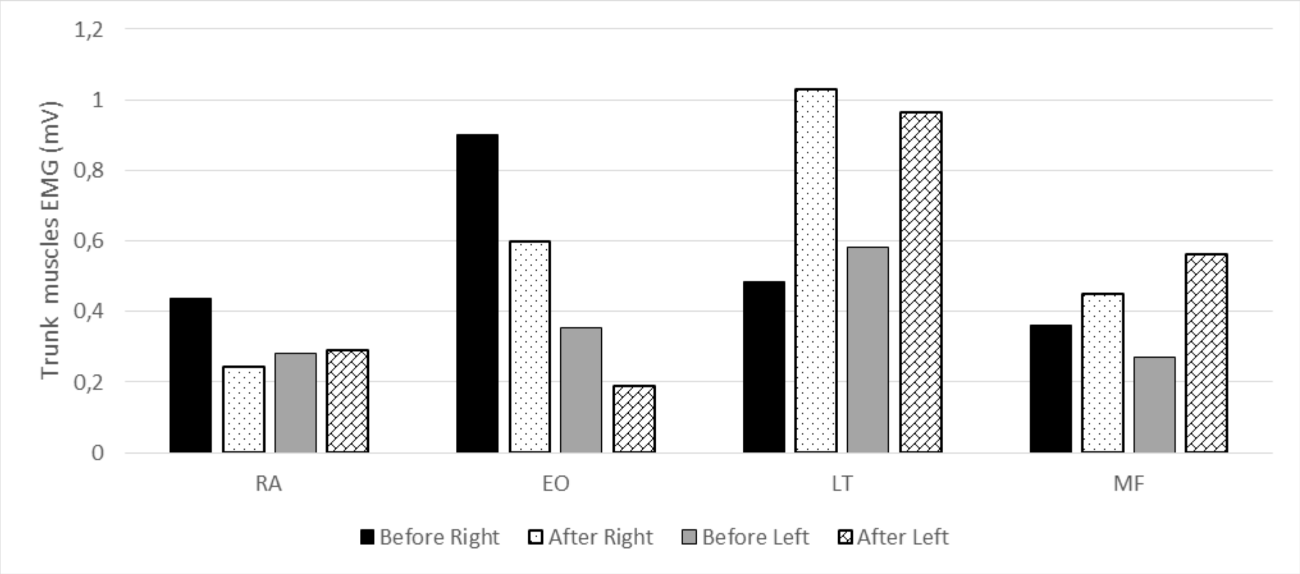

Figure 1. EMG between right and left sides in RA, EO, LT and MF during walking; *p<0,05 – between left and right sides; #p<0,05 – difference before and after HT trunk muscles.

EMG of the trunk muscles (Fig. 2) was statistically greater in the right vs the left side in the RA, EO before HT and EO, LT after HT, as well as statistically lower in the right vs the left side in the LT before HT, and MF before and after HT.

The trunk muscles EMG was statistically greater after HT in the right side of the MF muscles, also the left side of the MF muscles. The trunk muscles EMG was statistically lower after HT in the right side of the RA, EO and LT muscles, also the left side of the RA, EO, LT muscles.

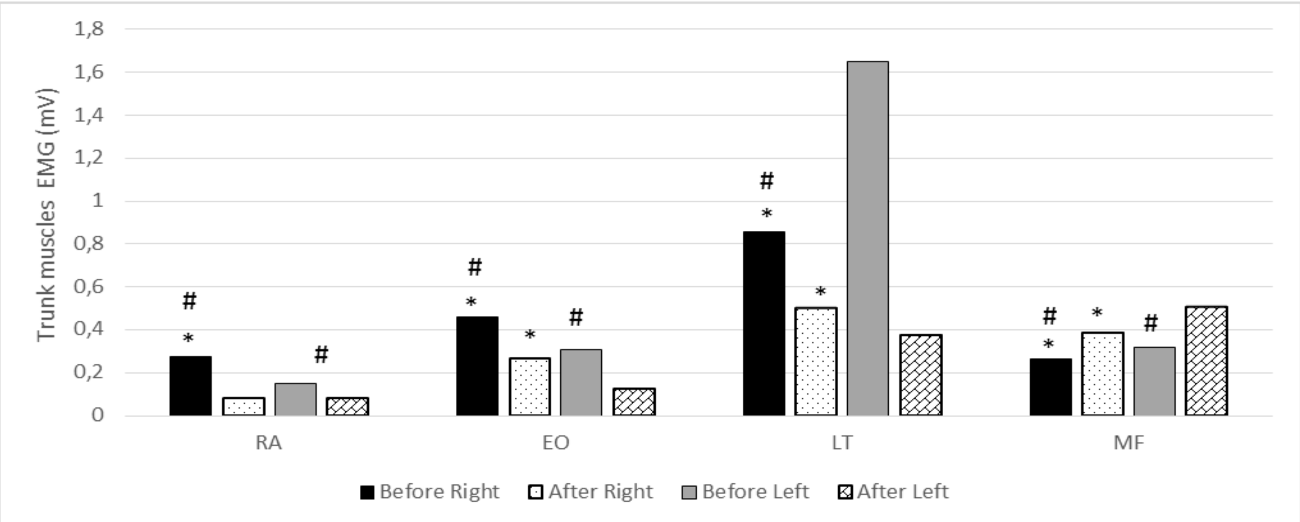

Figure 2. EMG between right and left sides in RA, EO, LT and MF from sitting to standing position; *p<0,05 – between left and right sides; #p<0,05 – difference before and after HT

EMG of the trunk muscles (Fig. 3) was statistically greater in the right vs the left side in the RA, EO, LT before HT and RA, EO after HT, as well as statistically lower in the right vs the left side in the MF before and after HT and LT after HT.

The trunk muscles EMG was statistically greater after HT in the right side of the LT, MF muscles, also the left side of the LT, MF muscles. The trunk muscles EMG was statistically lower after HT in the right side of the RA, EO muscles, also the left side of the RA, EO muscles.

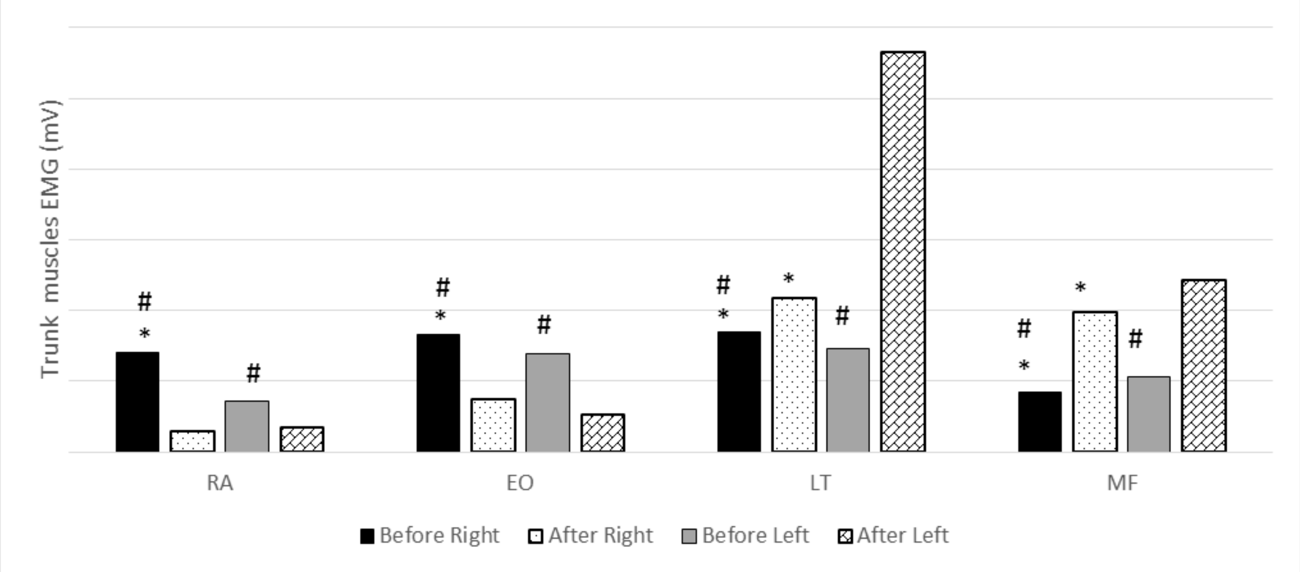

Figure 3. EMG between right and left sides in RA, EO, LT and MF from standing to sitting position; *p<0,05 – between left and right sides; #p<0,05 – difference before and after HT

EMG of the trunk muscles (Fig. 4) was statistically greater in the right vs the left side in the RA, LT before HT and EO after HT, as well as statistically lower in the right vs the left side in the MF before and after HT and LT after HT.

The trunk muscles EMG was statistically greater after HT in the right side of the RA, EO, MF muscles, also the left side of the RA, EO, LT, MF muscles. The trunk muscles EMG was statistically lower after HT in the right side of the LT muscles.

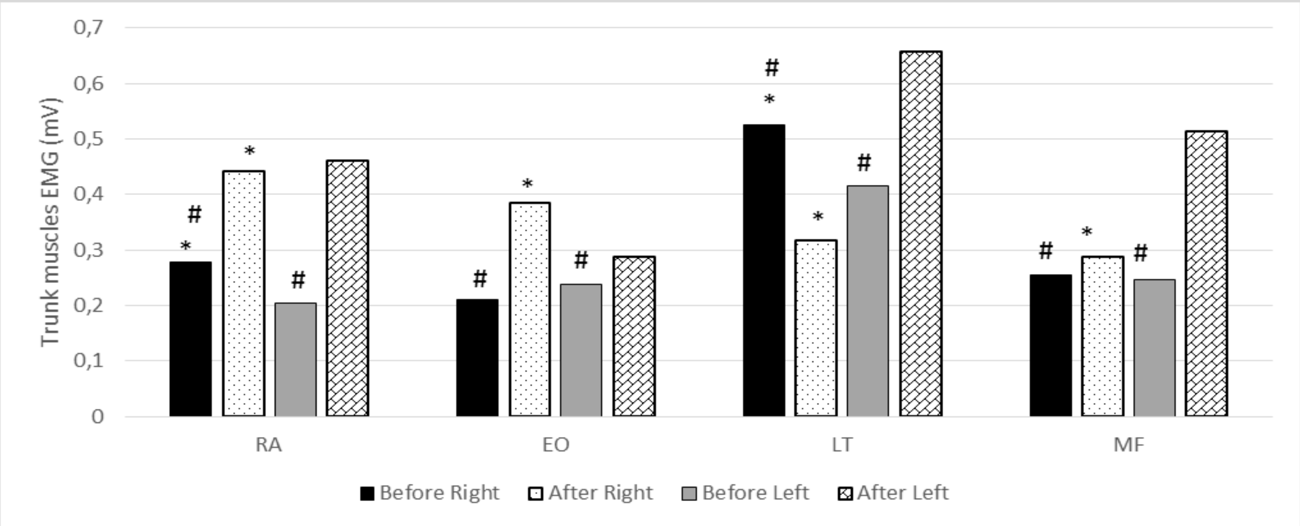

Figure 4. EMG between right and left sides in RA, EO, LT and MF during riding; *p<0,05 – between left and right sides; #p<0,05 – difference before and after HT

After HT isometric grip strength was greater accordingly in the right (47%) and left (2%) hands. The isometric grip strength symmetry between the right and left hands occurs after HT ($p<0.05$)

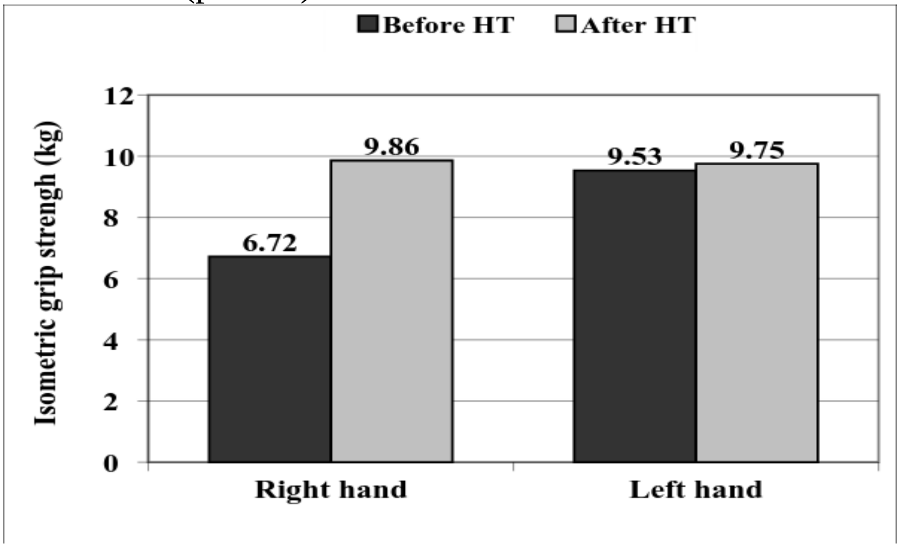

Figure 5. Isometric grip strength and balance results (right and left hand) before and after hippotherapy.

Table 1.

Functional mobility before and after hippotherapy

Assessment	Before	After
Steps	36	29
Rivermead motor assessment gross function scale	6	9

After HT the step length increased (20%) and functional mobility in 50% was set up as well.

Discussion on the results of the research

This study was conducted to test whether the neuromechanic behavior of trunk muscles was different between the sides of the subject who had undergone coma after head trauma. The main findings of this study were that: after HT in the left side EMG of trunk muscles increased ($p<0.05$) during all three tasks and in right sides in the first and second task, also after HT the subject’s functional mobility and hand grasping force increased.

The major functional impairments after TBI include reduced muscle strength, sensory impairment (disturbed afferent and efferent information), and disorder, coordination and motor control disorganization (Keren et al., 2000).

It is well known, that CNS plays the key role in muscle activity amount needed to support, or stabilize, the spine in an optimal manner. All trunk muscles are important contributors to spine stability. In our study, we found greater EMG of RA, EO, LT and MF muscles in the right vs left side during walking, and RA, LT during riding. The body asymmetry in upright posture is associated with various outcomes such as decreased loading of the affected side (Bohannon et al., 1985; Aruin, 2006), degenerative changes of the pelvic tilt, which is common in individuals with hemiparesis. The presence of body asymmetry, the CNS adopted a strategy of activating muscles on the contralateral side of the body to compensate for the effects of an additional mechanical constraint (Sackley, 1991; Aruuin 2006). Dickstein (2010) et al reported, that the trunk muscle correlation between the two sides in the hemiplegic patients was significantly lower than in the healthy indicating that for severely afflicted patients, simultaneous activity of both sides might be impaired both when the muscles serve as prime movers or for restraint.

Moreover, we found the differences between the left and right sides during standing up from sitting and sitting down from standing position. Motor and sensory deficits are two of the major factors influencing performance in the trunk reposition to trunk forward flexion and backward extension positions. Lisa (2015) et al. reported that the activity of the RA and EO muscles on the paretic side was reduced when compared with that of the RA and EO muscles on the non-paretic side during trunk flexion for patient after stroke. However, the abdominal muscles (RA, EO) seem to serve a unique function in trunk motor control (Crommert, 2010).

After HT in left side EMG of RA, EO, LT, MF muscles increased ($p<0.05$) during all three tasks and in right side in the first and second task, and in the third task it increased ($p<0.05$) only in RA, EO, MF muscles. In HT, horse moves in three-dimensional spaces: up and down, forwards and backwards, to the left and to the right. Furthermore, movements of a horse's hips, pelvis and limbs provoke rider's movements in all three dimensional spaces. Our results are similar to other studies. Rebecca (2012) et al. demonstrated improvements in proper trunk alignment due to the horse exercising his pelvic muscles during HT for children with cerebral palsy. It has already been shown that muscle force production might be improved and that greater strength can be translated into functional gains. We presume that subject increased ability to maintain an upright sitting position is related with the increased core strength.

It is well defined that reaching to grasp an object of interest requires complex sensorimotor coordination involving eye, head, hand and trunk for subjects after stroke and with cerebral palsy (Saavedra et al., 2008). Trunk compensation may also be associated with insufficient trunk and proximal muscle strength (Wu et al., 2013). Subjects with chronic hemiparesis compensate for arm movement deficits with new degrees of freedom in trunk movements (Pereira et al., 2010; Cirtea and Levin, 2000; Thielman et al., 2008). We have found that after HT hand muscle grasping force in paretic hand increased by 47%. Stability of the spine allows movements of trunk and at the same time is a foundation that extremity movements can independently act (Reeves et al., 2007). We presume that increased grasping muscle strength is related with the increased trunk muscle strength and increased ability to maintain upright position. Furthermore, after HT functional mobility increased by 50%. Trunk control has been shown to be a valid predictor of stroke rehabilitation outcome and to correlate positively with established functional and motor assessments (Champagne et al., 2011; Harris et al., 2012).

Conclusions. For subject who had undergone coma after hippotherapy EMG of trunk muscles increased in the left side during all three tasks and in right sides in first and second task, as well as increased subject step length, functional mobility and hand grasping force.

References:

1. Adamas, SA., Pickering, RM., Ashburn, A. Lincoln, LB. (1997). The scalability of the Rivermead Motor Assessment in nonacute stroke patients. *Clin Rehabil February, 1997 (11)*, 52-59.
2. Bracher, M. (2000). Therapeutic Horse Riding: What has this to do with Occupational Therapists? *British Journal of Occupational Therapy, 63 (6),* 277.
3. Bohannon, R.W., Larkin, P.A. (1985). Lower extremity weight bearing under various standing conditions in independently ambulatory patients with hemiparesis. *Phys. Ther., 6*, 1323–1325.
4. Bukowska-Johnson, G. (2011). Hippotherapy as one of the forms of rehabilitation. *Journal of Health Promotion and Recreation (3),* 5.
5. Champagne, A., Descarreaux, M., and Lafond, D. (2008). Back and hip extensor muscles fatigue in healthy subjects: task dependency effect of two variants of the Sorensen test. *European Spine Journal, 17*, 1721–1726.
6. Cirstea, MC, Levin, MF. (2000). Compensatory strategies for reaching in stroke. *Brain, 123 (5)*, 940–953.
7. Cromert, ME. (2010). On the role of transversus abdominis in trunk motor control [http://www.diva-portal.org/smash/get/diva2:405950/FULLTEXT01.pdf].
8. Dickstein, R., Heves, Y., Laufer, Y., Ben-Haim, Z. (2010). Activation of selected trunk muscles during symmetric functional activities in poststroke hemiparetic and hemiplegic patients. *Journal of Neurology Neurosurgery, and Psychiatry, 66 (2)*, 218–219.
9. Ekstrom, R., Donatelli, R. A., Carp, K. C. (2007). Electromyographic Analysis of Core Trunk, Hip, and Thigh Muscles During 9 Rehabilitation Exercises. *Journal of Orthopaedic and Sports Physical Therapy, 37 (12)*, 754 – 762.
10. Fujimoto, S. T., Longhia, L., Saatmana, K. E., McIntosh, T. K. (2004). Motor and cognitive function evaluation following experimental traumatic brain injury. *Neuroscience & Biobehavioral Reviews, 28 (4)*, 365–378.
11. Harris, R., Karthikbabu, S., Chakrapani, M., Prem, V. (2013). A review on assessment and treatment of the trunk in stroke. *Neura Regeneration Research, 5(25),* 1974–1977.
12. Keren, O., Reznik, J., Groswasser, Z. (2000). Combined motor disturbances following severe traumatic brain injury: an integrative long-term treatment approach. *Brain injury, 15 (7)*, 633-638.
13. Dusik, L. A., Menard, M. R., Cooke, Ch., Fairburn, S. M., Beach, G. N. (1993). Concurrent Validity of the ERGOS Work Simulator Versus Conventional Functional Capacity Evaluation Techniques in a Workers' Compensation Population. *Journal of Occupational and Environmental Medicine, 35 (8)*, 68-76.
14. Pereira, LM., Marcucci, FC., Oliveira Menacho, M., Garanhani, RM., Lavado, EL., Cardoso, JR. (2010). Electromyographic activity of selected trunk muscles in subjects with and without hemiparesis during therapeutic exercise. *Journal of Electromyography and Kinesiology 21 (2011*), 327–332.
15. Powell, J., Heslin, J, Greenwood, R. (2002). Community based rehabilitation after severe traumatic brain injury: a randomised controlled trial. *Neurol Neurosurg Psychiatry; 72*, 193-202.
16. Rebbeca, D., Park, ES., Rha, DW., Jung, S. (2012). Effects of Hippotherapy on Gross Motor Function and Functional Performance of Children with Cerebral Palsy. *Medical Journal, 55(6)*, 1376-1742.
17. Reeves, NP., Narendra, KS., Cholewski, J. (2007). Spine stability: the six blind men and elephant. *Clinical Biomechanic, 22*, 266-274.
18. Saavedra, S. L., Donkelaar, P., Woollacott, M. H. (2012). Learning about gravity: segmental assessment of upright control as infants develop independent sitting. *Journal of Neurophysiology, 108*, 2215–2229.
19. Sackley, C.M. (1991). Falls, sway, and symmetry of weight-bearing after stroke. *Int. Disabil. Stud., 13*, 1–4.
20. Sterba, J. (2007). Does horseback riding therapy or therapist-directed hippotherapy rehabilitate children with cerebral palsy? *Developmental Medicine & Child Neurology, 2007 (49)*, 68-73.

21. Teasdale, G. M. (1995). Head injury. *Journal of Neurology Neurosurgery, and Psychiatry, 58,* 526 – 539.
22. Wu, Ch., Yang, Ch., Wu, L. (2013). Unilateral versus bilateral robot-assisted rehabilitation on arm-trunk control and functions post stroke: a randomized controlled trial. *Journal of a Neuro Engineering and Rehabilitation, 10,* 35 - 110.

УДК 159.923.32

Савелюк Н.М.

ПСИХОЛОГІЧНІ ТИПИ РОЗУМІННЯ МОЛИТВИ «ОТЧЕ НАШ»

Савелюк Н.М. Психологічні типи розуміння молитви «Отче наш». У статті здійснюється стислий огляд теоретичних напрацювань у галузі психології молитви й описуються результати авторського емпіричного дослідження. Констатується, що у сучасних виданнях, присвячених психології релігії, молитва найчастіше визначається як звернення віруючих до Бога, надприродних сил, святих із проханнями, подяками, уславленнями. Через застосування авторської методики емпірично виокремлено й описано 12 основних психологічних типів розуміння молитви «Отче наш»: «раціональний», «раціонально-перцептивний», «раціонально-метафоричний», «раціонально-ціннісний», «раціонально-критичний», «емоційно-ціннісний», «емоційно-метафоричний», «перцептивно-метафоричний», «перцептивно-ціннісний», «ціннісно-метафоричний», «інтуїтивно-синкретичний» та «суперечливий».

Ключові слова: молитва, молитва «Отче наш», розуміння, мислення, емоції, перцепція, інтуїція, цінності, метафора.

Савелюк Н.М. Психологические типы понимания молитвы «Отче наш». В статье кратко рассматриваются теоретические наработки в сфере психологии молитвы и описываются результаты авторского эмпирического исследования. Констатируется, что в современных изданиях, посвященных психологии религии, молитва чаще всего определяется как обращение верующих к Богу, сверхъестественным силам, святым с просьбами, благодарениями, восхвалениями. Через использование авторской методики эмпирически выделено и описано 12 основных психологических типов понимания молитвы «Отче наш»: «рациональный», «рационально-перцептивный», «рационально-метафорический», «рационально-ценностный», «рационально-критический», «эмоционально-ценностный», «эмоционально-метафорический», «перцептивно-метафорический», «перцептивно-ценностный», «ценностно-метафорический», «интуитивно-синкретический» и «противоречивый».

Ключевые слова: молитва, молитва «Отче наш», понимание, мышление, эмоции, перцепция, интуиция, ценности, метафора.

Вступ. Попри різноманітні історичні, культурні, політичні й інші трансформації стабільними залишаються так звані загальнолюдські цінності як незмінні орієнтири життя у транснаціональному його форматі. Серед них – духовні, в тому числі релігійні, такі вартості, одним із вербалізованих втілень яких для християн усього світу є молитва «Отче наш». До сьогодні вона детально проаналізована святими Отцями, відомими богословами, релігієзнавцями в аспекті свого правильного, належного з духовної точки зору прочитання і розуміння. Поряд із цим, для «звичайної» людини ця священна молитва відкривається й неканонічними своїми смисловими гранями, відштовхуючись від яких, а не тільки від загальновизнаної інтерпретації, віряни нерідко насправді почувають, мислять, діють. Очевидно, що з подібними індивідуальними тлумаченнями, які мають, насамперед, психологічні свої чинники, повинні бути обізнані не тільки сучасні священнослужителі, а і психологи, котрі так чи інакше торкаються духовних аспектів буття особистості.