THE EFFECT OF VISUAL SCANNING EXERCISES INTEGRATED INTO TASK-SPECIFIC ACTIVITIES ON THE FUNCTIONAL ABILITY IN PATIENTS WITH VISUAL PERCEPTUAL DISORDERS POST STROKE

By

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STATEMENT

I Andoret van Wyk, declare that the dissertation which I hereby submit for the degree M PhysT at the University of Pretoria, is my own work and has not been previously submitted by me for a degree at another tertiary institution.

Where secondary material has been used, this has been carefully acknowledged and referenced in accordance with the university requirements. I am aware of university policies and implications regarding plagiarism.

Andoret van Wyk

Date

2013
TO WHOM IT MAY CONCERN

Andoret van Wyk’s MPHYST dissertation has been proofread by me. Changes were made to a hard-copy version of the dissertation and the student herself applied the changes to the version of the dissertation intended for submission to the University of Pretoria.

Barbara English

7 May 2012
EXPRESSION OF THANKS

I would like to sincerely thank Dr Eksteen for her dedication and continued support throughout the study. I have learned so much during the whole process and am incredibly thankful for her dedication and sharing of her knowledge.

A very special thank you to Wessel and my whole family for their continued motivation throughout the study.

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ABSTRACT

Stroke is the first cause of disability and second most frequent cause of mortality after ischemic heart disease in adults worldwide. The influence of visual system impairment on the patient’s functional ability and quality of life are still largely neglected in neurological rehabilitation. Therapists are seldom concerned with the visual status and ability of their patients. Members of the rehabilitation team rarely assess, monitor or treat impairment of visual efficiency processes and visual information processing dysfunction that may be observed in patients after a stroke. In the absence of specific intervention visual deficits stabilise and become permanent due to poor or almost absent spontaneous recovery of the visual system in stroke patients.

A matched-pair randomised controlled trial was conducted. Twenty-four (24) participants were screened based on their functional activity level as measured on the Stroke Activity Scale (SAS). When a participant’s SAS score matched a previously allocated participant’s score, that particular participant was placed in the opposite group from the existing matched participant. If the newly assessed participant’s SAS did not match another participant’s SAS, the participant was randomly allocated to either the experimental or the control group. The process was repeated until (24) patients had been allocated into two groups consisting of twelve (12) participants per group as they were admitted to Tshwane Rehabilitation Centre (TRC).

Group 1 (Experimental Group) received saccadic eye movement training with visual scanning exercises integrated with task-specific activities and Group 2 (Control Group) received task-specific activities for four (4) consecutive weeks. Participants’
functional progress on body impairment and functional activity level were assessed and documented on a weekly basis during the intervention period of four (4) weeks. In order to determine whether the integration of visual scanning through saccadic eye movement training had a permanent or long-term effect on the participants’ functional ability and quality of life after rehabilitation had been terminated, functional progress on body impairment-, functional activity and participation levels as well as their perceived quality of life were assessed and documented eight (8), twelve (12), sixteen (16) and twenty (20) weeks after admission to the rehabilitation facility. A large number of participants were lost to follow-up following discharge from the TRC after the intervention period of four (4) weeks. As result of the small sample group at week eight (8), week twelve (12), week sixteen (16) and week twenty (20), these results were not discussed.

Results of the matched-pair randomised controlled trial indicated that the effect of saccadic eye movement training with visual scanning exercises integrated with task specific activities as an intervention for participants that presented with unilateral spatial inattention, visual-spatial disorders and visual-constructive disorders post-stroke resulted in significant improvement in impairment level. This improvement related to oculomotor visual performance, visual attention, depression as well as results on functional activity level with regard to the ability to independently complete ADL after four (4) weeks of rehabilitation.

It may therefore be concluded that saccadic eye movement training with visual scanning exercises integrated with task-specific activities as an intervention tend to
improve functional ability in participants that presented with unilateral spatial inattention, visual-spatial disorders and visual-constructive disorders post-stroke.
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<tr>
<td>ADL</td>
<td>Activities of daily living</td>
</tr>
<tr>
<td>aekde1</td>
<td>The average number of errors made during the completion of the King-Devick Subtest 1</td>
</tr>
<tr>
<td>aekde2</td>
<td>The average number of errors made during the completion of the King-Devick Subtest 2</td>
</tr>
<tr>
<td>aekde3</td>
<td>The average number of errors made during the completion of the King-Devick Subtest 3</td>
</tr>
<tr>
<td>AHA / ASA</td>
<td>American Heart Association and American Stroke Association</td>
</tr>
<tr>
<td>ANCOVA</td>
<td>Analysis of Covariance</td>
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<tr>
<td>AHCPR</td>
<td>United States Agency for Health Care Policy and Research</td>
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<tr>
<td>BADL</td>
<td>Basic activities of daily living</td>
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<tr>
<td>BDI</td>
<td>Beck Depression Inventory</td>
</tr>
<tr>
<td>BI</td>
<td>Barthel Index</td>
</tr>
<tr>
<td>BIT</td>
<td>Behavioural Inattention Test</td>
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<tr>
<td>CNS</td>
<td>Central Nervous System</td>
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<tr>
<td>CVI</td>
<td>Cerebral vascular incident</td>
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<td>EST</td>
<td>Explorative saccade training</td>
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<tr>
<td>FARS</td>
<td>Functional Autonomy Rating Scale</td>
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<tr>
<td>FIM</td>
<td>Functional Independence Measurement</td>
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<tr>
<td>fMRI</td>
<td>Functional Magnetic Resonance Imaging</td>
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<tr>
<td>FT</td>
<td>Flicker-stimulation training</td>
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<tr>
<td>HADS</td>
<td>Hospital Anxiety and Depression Scale</td>
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<tr>
<td>HADSA</td>
<td>Anxiety subscale</td>
</tr>
<tr>
<td>HADSD</td>
<td>Depression subscale</td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
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<tr>
<td>HRP</td>
<td>High-resolution perimetry</td>
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HVFDs  Homonymous visual field defects
IADL  Instrumental activities of daily living
ICC  Intraclass correlation coefficients
ICF  International Classification of Functioning, Disability and Health
kde1  King-Devick Subtest 1
kde2  King-Devick Subtest 2
kde3  King-Devick Subtest 3
MAACL  Multiple Affect Adjective Checklist
MADRS  Montgomery Asberg Depression Rating Scale
MAT  Modified Metropolitan Achievement Test
MMAS  Modified Motor Assessment Scale
MMS  Mini-Mental Status
MMSE  Mini-Mental State Examination
PPC  Posterior Parietal Cortex
RCT  Randomised controlled trial
SAS  Stroke Activity Scale
SC  Superior colliculus
SD  Standard Deviation
SIS  Stroke Impact Scale Version 3.0
starcorrect  Results of the correct number of stars “cancelled” during the completion of the Star Cancellation Test
starttime  Results of the time taken to complete the Star Cancellation Test
TRC  Tshwane Rehabilitation Centre
TUG  Timed Up and Go Test
UP  University of Pretoria
UNS  Unilateral Neglect Syndrome
USI  Unilateral Spatial Inattention
<table>
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<tr>
<td>USN</td>
<td>Unilateral Spatial Neglect</td>
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<tr>
<td>V1</td>
<td>Primary visual cortex</td>
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<tr>
<td>VCR</td>
<td>Vestibulocollic Reflex</td>
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<tr>
<td>VOR</td>
<td>Vestibulo-ocular Reflex</td>
</tr>
<tr>
<td>VRT</td>
<td>Vision Restoration Training</td>
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<tr>
<td>VS</td>
<td>Visual search</td>
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<tr>
<td>VSR</td>
<td>Vestibulospinal Reflex</td>
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<tr>
<td>TNR</td>
<td>Tonic Neck Reflex</td>
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<tr>
<td>WAIS</td>
<td>Wechsler Adult Intelligence Scale</td>
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<tr>
<td>WHO</td>
<td>World Health Organization</td>
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<tr>
<td>WRAT</td>
<td>Wide Range Reading Achievement Test</td>
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