

## **Responsibility of neurosurgeons in cooperation with clinical neuropsychologists to accomplish full social re-entry and good HRQoL for patients following acute brain damage**

**Klaus R.H. von Wild, Birgit Kemper\***

Professor of Neurosurgery, Medical Faculty Westphalia Wilhelm's - University, Münster, D

Professor of reconstructive neurosurgery of brain and spinal cord lesions, INI, Hannover, D

Professor h. c. Department Physical Rehabilitation Al Azhar University, Cairo EGY

\*Head Neuropsychologist, Special unit for early neurosurgical rehabilitation, Clinic for Neurosurgical, Director Prof. Dr. med. Uta Schick, Clemens Hospital, Academic Hospital of the Medical Faculty W.W.-University, Münster, D

### **Abstract**

*Objectives:* Physical neurologic and neuropsychological rehabilitation has an old tradition in Europe. Clinical recovery of physical neurological impairments following acute brain damaged do not guarantee successful social re-entry when overlooking long-lasting mental – cognitive, behavioural deficits after clinical demission. Problems in emotional adjustment are long-lasting and hinder social re-entry.

*Patients and methods:* Transdisciplinary early neurorehabilitation is based on careful physical and mental - cognitive diagnostics for an individualized therapeutic intervention, when neuropsychology is essential in patients with brain lesions. The role of individually planned early neuro-psychotherapy is underestimated when dealing with patients catastrophic reactions as first described by Kurt Goldstein. This was exemplarily demonstrated in a patient with severe higher cortical functioning disturbances after acute intracerebral haemorrhage and coma, followed by secondary hydrocephalus and major

emotional adjustment behavioural disturbances.

*Results:* The 65 years old business man, who suffered from persisting complex mental-cognitive, behavioural, mood and emotional disturbances recovered full social competence due to professional neuropsychological neuropsychiatric treatment.

*Discussion:* Early catastrophic reactions and fear of loss of self-identity are important key issues in the emotional adjustment after brain damaged. Further research is needed to explaining the links between loss of self-esteem, self-identity and the development of depression. Attention needs to be focused on a recovery beyond functional outcome. Conclusion: Neurosurgical-neuropsychological rehabilitation is a method to reconstruct lives within a social context.

**Keywords:** intracerebral haemorrhage, mood disorders, neurosurgical-neuropsychological rehabilitation, psychotherapeutic intervention secondary hydrocephalus, stroke depression

## Introduction

“Brain damage has become synonymous with loss of skills, while rehabilitation of brain-damaged individuals has become known as a method to restructure life within a social context” quotation A.L. Christensen (p. XV, Kluwer Acad. Press 1988)

Recently there has been growing interest in the topics of mood disorders after traumatic brain injuries and cerebrovascular diseases (Jorge, Starkstein & Robinson, 2010; Lökk & Delbari, 2010; Robinson, 2010; Whelan- Goodinson et al. 2009; Whealan- Goodinson et al. 2010). It is well known that the severity of depression and neurocognitive impairments in brain injured patients have an impact on the response to rehabilitation, functional recovery, long-term community re-integration, mental well-being and life satisfaction (Bullinger et al. 2002, Carod – Artal & Egidio, 2009; Donellan et al. 2010; Green & King, 2010, von Steinbüchel et al., 2010; West et al. 2010). Emotional and behavioural disturbances after cerebrovascular diseases can be summarized as post-stroke depression and mania, post-stroke anxiety disorders, post-traumatic stress disorders and personality changes with special emphasize on apathy (Dafer et al. 2008; Hama et al. 2007). The varied prevalence rates for depression in stroke patients from 20-50%, with an apparent peak within the first six months of the onset of event, depend on the one hand on study design, diagnostic assessment tools, and time elapsed after stroke onset (Hackett et al. 2005; Whyte et al. 2004). On the other hand, in many cases pseudodepressive mood disorders in the acute stage are also classified simply as „depression“ without taking into account the differential

diagnosis of catastrophic reactions in the sense of Kurt Goldstein (1948), pseudobulbar affect, apathy and anxiety.

Although some patients show complete or nearly complete physical recovery following cerebrovascular insults, they may have profound and long-lasting residual neuropsychological deficits and even an increasing risk of developing neuropsychiatric disorders. This raises the question of how the interaction of manifold cognitive disturbances, e.g. attention, memory and language impairments, executive dysfunctions, and kind of emotional coping among these populations, influence their subjectively perceived health. Although it is well known that depression may interfere with both functional recovery and long-term social outcome, psychotherapeutic outpatient services and the development of psychotherapeutic approaches for brain injured populations are rare. An explanation could be that the effectiveness of psychotherapy in brain injured patients has controversially been discussed for years (Christensen & Rosenberg, 1991; Judd & Wilson, 2005). Disorders of self-awareness and the severity of neurocognitive impairment were thought to be a complete contraindication for psychotherapeutic interventions. Psychotherapy today is often part of a holistic approach, developed with the main aim of integrating issues such as cognitive rehabilitation and return to work with special attention to identity and awareness changes (Coetzer, 2008). Especially patients with traumatic brain injury and post-stroke may benefit from these programs.

Research on psychosocial treatments for depression in non-stroke and stroke population has focused on the impact of

cognitive and behavioural therapy and problem-focused therapy (Broomfield et al. 2010; Mynors-Wallis et al. 1995; Mynors-Wallis et al. 1997). The role of nursing in stroke survivors was considered important, but therapeutically non-specific (Kirkevold, 2010). In our opinion these programs do not offer adequate interventions for patients who are searching for answers to questions such as what makes life meaningful after suffering completely unexpected brain damage while struggling with reduced self-esteem, grief and deep fear of loss of the individual's historical view of him- or herself. The outcome of psychotherapy after traumatic brain injury and other kind of brain damage, e.g. vascular, hydrocephalus compression, should be discussed against the background of complex interactions of the therapeutic bond, the patient's pre-injury personality, injury variables, the selection of special psychotherapeutic elements and the dynamic of the therapy process itself. Therefore some authors demand a theoretical core model to guide psychotherapeutic practice and research in brain injured patients (Coetzer, 2007). The authors stress that one has to be aware of the strengths and limitations of psychotherapy after acute brain lesions, and that careful selection of patients for psychotherapy is an essential part within holistic neurorehabilitation management (Prigatano, 1995; Klonhoff, 2010).

This can exemplarily be demonstrated by the case report below, in which a 65-year old business man developed a catastrophic reaction, moderate clinical depressive symptoms, and neurocognitive deficits especially in attention and memory four months after his cerebrovascular accident. Our psychotherapeutic attitude and

interdisciplinary thinking in our neuropsychological work are influenced by the pioneering work and humane rehabilitation approach of Goldstein and by Prigatano's principles of neuropsychological rehabilitation (Goldstein 1948; Christensen et al., 2009, Prigatano, 1999). The broad theoretical base, models and practical techniques proposed by Barbara Wilson also influenced our clinical practice (Wilson et al 2009). Following the diagnostic procedures we resolved to offer the patient early psychotherapy.

### **Case report**

#### **1. Medical History**

A 65-year-old very successful businessman, H.W., with an energetic kind of personality, suffered a spontaneous hypertonic mass bleeding in the left cerebellar hemisphere; he was immediately transferred from the neurological department to the nearest neurosurgical hospital. After exclusion of an anomaly of cerebral vessels (e.g. a-v malformation) by angio-CCT, a right frontal external ventricular drainage was immediately set in place and left for seven days. During the neurosurgical intensive care treatment the patient regained consciousness (GSC 9, then 11 and 12) and a left cerebellar symptomatology was observed. H.W. was able to interact and communicate with his environment, but he was not oriented to person, place and time. He also showed uncertainties in recognizing close relatives. Recovered and slightly oriented (GCS 13, 14) the patient strictly refused any kind of further diagnostics and early neurological-neurosurgical rehabilitation during his post-acute recovery on the internal medical ward, where he had been transferred for

treatment of his high blood pressure and diabetes II. So after four weeks the patient was sent home.

Thereafter H.W. had an appointment with the author who had seen the patient as a neurosurgical consultant during the acute stage, having been on cordial terms with the family for some years. The neurological examination was without any deficits while the brain damage, as expected, caused obviously remarkable mental-cognitive and behavioural deficits. Hence we started the neuropsychological evaluation as usual. Depressive mood turned out to be the patient's leading complaint.

Despite the warmth, love, and closeness of his wife who took care of him, it was extremely difficult to convince the gentleman to follow a proper non-medical neuropsychological-behavioural assessment at that time. It was not before six weeks later, upon the neurosurgeon's recommendation, that H.W. underwent his first neuropsychological examination.

## 2. Patient's Subjective report

### Cognitive impairment

The patient complained of memory problems. He forgot names of well-known customers. He reported that he could not remember telephone conversations in detail. He needed more time for routine activities. He complained of a mental slowness, feelings of visual overwhelming in public facilities, and attention problems during longer conversation and when conducting negotiations with customers.

### ***Emotional and behavioural changes***

The patient reported about his tendency to observe every bodily change and his fear to suffer again a sudden cerebral haemorrhage. He felt anxious because he did not understand his obviously reduced toughness and failures in managing his

every day and job activities. He could not stop pondering about his health and his future, complained of his deep loss of energy, felt very ashamed of his failures, had a tendency to self-blame, and tried to hide his difficulties. Although he was a person enjoying social engagement in his respected role as a businessman in his field, he avoided attending social events and meeting former friends. He questioned most of his life achievements, his identity as a businessman and asked himself if life was still meaningful. Asking him about thoughts on committing suicide he negotiated suicidal intentions convincingly.

## 3. Objective Neuropsychological Test Findings

The patient was oriented to time and place. He had very vague recollections of the events during his medical treatment at the intensive care unit. An aphasia screening (token-test) showed no abnormal results. The patient's speech was fluent, but results of a word fluency task were reduced (Benton word fluency). Subtests of the German Aachener Aphasia test battery comprising naming, reading and writing were completely in the normal range. Measures of premorbid intellectual functioning by means of a vocabulary test (MWT-B) suggested that his premorbid IQ had most likely been 100 to 110.

A computerized diagnostic of basic attention function (TAP) demonstrated slow reaction times in an alertness task and a go/no-go test. The patient was overtaxed by a complex divided attention task. Further tests of memory function revealed normal results on verbal and non verbal digit span forward and backward. On the Rey Auditory Verbal Learning test all test parameters (initial production, learning, immediate und delayed recall, recognition)

demonstrated results in the abnormal range.

Non-verbal memory tests also revealed considerable impairments in learning and visual retention (DCS, Benton-Test).

4. Behaviour and communication characteristics during the neuropsychological assessment.

During the first brief diagnostics of basic cognitive functions the patient realized his cognitive failures and showed a catastrophic reaction as described by Goldstein. During assessment he showed a short moment of deep tearfulness and then refused vehemently to go on with the cognitive tests. He became angry with the therapist, affronted her for her choice of tests which she might do with children. He questioned her academic qualification. After supportive therapeutic interventions, mirroring the perceived tension and expressing understanding of his anger, the patient apologized. It was remarkable that the patient was not able to talk about how he experienced his failures on an emotional level. He never used words like sadness or desperation etc. The therapist's impression was that H.W. fought with himself in order not to lose all his emotional control and tried to present himself as an invulnerable human being. In his role as a solicitous, energetic kind of businessman he wanted also to be the manager of the therapeutic situation. When the therapist undertook a more direct part in the communication, the patient showed a moderate flight of ideas. This approach evoked his defensive denial disturbing the therapeutic communication process. In this context the patient talked about affairs of the hospital and about things happening in the world. He inquired for the therapist's private life. Flirtatious

behaviour changed with a dominant attitude towards the neuropsychologist. Asking him about his relationship with his wife after the haemorrhage, he demanded from the therapist not to speak of and involve her. At the end of the assessment the patient rejected vehemently psychotherapeutic support and treatment options in other rehabilitation centres.

After consulting the author neurosurgeon again, towards whom he demonstrated deep respect, the patient came back three weeks later and wanted at least to try to participate in psychotherapy.

5. Psychotherapeutic procedure

A short overview (see table 1) shows relevant aspects of the medical history and neuropsychological assessment according to a scheme to be found in different case reports of Prigatano (1999).

Results of the diagnostics revealed that neurocognitive deficits have an impact on the perceived health, but the subjectively experienced threat and the resulting catastrophic reaction of the patient's self are most relevant for his emotional suffering. The social withdrawal could pose a higher risk for developing permanent neuropsychiatric disorders and eventually increase the risk of committing suicide. In our opinion H.W. was an eligible candidate to benefit from psychotherapy. He exhibited excellent higher order language skills needed for a verbally mediated kind of therapy. He showed good behaviour control and he did not suffer from anosognosia. Despite moderate cognitive impairments in attention and memory, he was able to manage his activities of daily life independently.

**TABLE 1**  
**Clinical summary of the patient who experienced**

<b>Dimension</b>	<b>Content</b>
History	a spontaneous hypertonic mass bleeding in the left cerebellar hemisphere with infiltration into the fourth ventricle and consecutive obstructive hydrocephalus (emergency CCT, neurological clinic) at the age of 65 years. Patient evaluated during an outpatient consultation, neurological diagnostics without any evidence of functional impairments
Interview	highly ambivalent towards neuropsychological assessment, spontaneous mentioning of cognitive failures
“Projected” information	“You can't help me. I am coming because Professor von Wild has sent me.”
Phenomenological experience	“I don't know why I feel so much without energy and have difficulties in doing simple things. I am just a silly person.
Behaviour and emotional/ motivational characteristics during testing	catastrophic reaction, rejecting further cognitive tests, self-blame, peevishness towards the therapist, very reduced ability in emotional self-perception, irritable, feeling ashamed of his test results
<b>Conclusions</b>	
Reactionary	catastrophic reaction, symptoms of depression and anxiety
Neuropsychological	moderate attention and memory deficits, excellent preserved language functions, defensive denial towards all recommendations of non-medical treatment options
Characterological personality	solicitous energetic kind of patriarchally structured duteous, very emotionally controlled person

We considered four kinds of therapeutic steps in our phases of treatment, constituting the process over six months. The steps were used flexibly in a non-hierarchical way during the therapy. In summary, in our procedure we focused on 1. therapeutic alliance, 2. education about kind and nature of the neuropsychological disorders, 3. supportive psychotherapeutic interventions, 4. computerized cognitive training, and 5. development of

compensatory techniques for the management of memory problems

During the first month the patient came twice a week, then once a week. Every therapy session was limited to 60 minutes. As mentioned above, H.W. was found to be difficult to engage in the therapy because of his denial due to his anxiety and his deep shame of needing psychotherapeutic support, which was not compatible with his premorbid self-identity.

We believe that the interdisciplinary collaboration between the neurosurgeon and the neuropsychologist at the beginning was a first step to engage the patient in the therapy and to promote the development of a therapeutic alliance, which is a first important step. The therapeutic bond helps an anxious patient to feel safe. The anxiety was expressed by the patient's increased observation of every bodily change and his fear to suffer again a haemorrhage. He was upset and developed irrational fears explaining his difficulties. He sometimes believed that his symptoms could be evidence for a devastating development of Alzheimer's disease. Therefore the patient was educated several times on the nature of his neuropsychological impairment. After about three months, his irrational explanations and moments of fear came back again and again. H.W. needed repeated confirmation by his neurosurgeon that the risk for a new bleeding was low.

The general fear, the defensive coping strategies of the patient, and the characteristics of his premorbid personality endangered his engagement throughout the whole therapy. During the therapeutic dialogue it became obvious that his fear decreased when the therapist proceeded slowly with a supportive approach. Numerous psychotherapy sessions were spent on mourning about his situation and talking about the circumstances of the sudden bleeding, impressions and experiences with physicians in the hospital. The bleeding seemed to be a traumatized event that meant to the patient an extraordinary overwhelming emotional experience in his life close to death. Only in two psychotherapy sessions after four months did the patient talk extensively about his past as a businessman, his great

success and his ethics in economy, which ended with a surprising emotional outburst and an irrational self-perception (self-degrading of being nothing now). After such kind of emotional outburst, H.W. released energy to become active in the therapy. He participated in a computerized cognitive training of attention functions. This step represented a great success considering that during the initial neuropsychological assessment the patient had demonstrated a catastrophic reaction. The therapist started with simple tasks to impart success to the patient. This approach motivated the patient to talk more openly about problems in his job and encouraged him to describe his everyday difficulties more precisely. He showed less avoidance when talking about his cognitive impairments. He began to accept being educated on the use of simple compensatory memory aids. He tried different memory aids (e.g. computerized time table, memory book, planning a week, more written notes immediately after important talks). It was obvious that his self-respect increased slowly. He developed a silent feeling of pride to be successful in using the memory techniques and enjoyed the therapist's feedback: "You are really a very good learner". From a psychological perspective it is interesting that he never mentioned that the compensation techniques were helpful in his everyday life. He increased his working hours to four hours per day and commented on this with "Now I am a retired person". The patient started to participate more actively in his company's business and visited social events more often, together with his wife. When preparing himself, the patient needed further emotional support because of repeated feelings of grief and insight that he

still struggled with cognitive deficits. At the end of psychotherapy H.W. was better able to experience his preserved mental resources. Clinically relevant, anxious depressive symptoms were decreased. The patient was on the way to engage in social life again. Looking at his achievements in his family and his great success as a businessman over more than 30 years allowed him to change his life-style in his sixties. He experienced that he was definitely able to practice other things that make life worth living. He stopped questioning himself about being worthless.

***Reflection of the psychotherapeutic process***

In our opinion the greatest challenge was to involve the patient in the therapeutic process, to manage his denial and to minimize the risk of abandoning therapy early.

One of the key questions was what can explain the patient's emotional and behavioural changes, which seemed to overcome his depressive symptoms?

In our context, the computerized cognitive training had more psychotherapeutic value than impact on the restoration of the functions themselves. Acquiring the use of memory compensation aids and computerized cognitive training in the course of the therapy improved his ability to sustain the threatening confrontation with his cognitive deficits. During computerized cognitive training, H.W. also experienced preserved mental resources to help stabilize his self-confidence with a positive influence on his getting involved in social activities again. In small steps H.W. increasingly dared to spend more hours working in his company.

It is also important to mention that during the course of the therapy our patient

did not give up his denial completely. It is well known that it would be easier for such patients to cope with their denial in a holistic rehabilitation setting including special groups with focus on denial problems. We regret that we could not offer such kind of treatment in our outpatient ward. During psychotherapy we accepted that H.W. arose more superficially his essential subjects of identity in the therapeutic dialogue. It was not possible to discuss openly the sense or non-sense of cognitive schemes, values and beliefs, for instance according to cognitive behaviourally oriented psychotherapy.

The avoidance to speak about emotional experiences and his values and beliefs should not per se be interpreted as negative. H.W.'s kind of coping should be understood against the background of his efficiency-oriented premorbid personality. His coping reflected a kind of protection the ambivalent patient needed in his overwhelming emotional life situation. It is remarkable that the patient came to all appointments in spite of his severe ambivalence. Our interventions mostly included supportive interventions according to a more client-centred method. The non-directive therapeutic relationship, the active listening by the psychotherapist and mirroring the patient's different emotional states seemed to reduce his extreme, anxious tension in the post acute state and his pressure to appear always as a perfect guy in the eyes of the therapist. Furthermore, the non-confronting approach may help to feel less dependent on other expectations and promote feelings of autonomy that are important in the context of his life role to be a tough businessman in an always leading position. We supported H.W. to be the "leader",



because to be a leader is one essential component positioned in his pre-injury self-identity. We also have to consider the impact on mourning about his emotional behavioural changes. Mourning is a process of reflection on the essence of something that has been lost (e.g. a relationship, abilities etc.) but still acts in us (Olders, 1989). By passing through the phases of grief, the bereaved person can develop an unconscious ability to change mental structures of meanings about the self (Horowitz, et al. 1993) and to develop inner emotional resources.

#### ***Implications for clinical practice***

Complete neurological recovery after brain damage does not imply that mental cognitive and psychiatric functional impairments do not exist. It is well known that mental cognitive and behavioural disabilities are more persistent and count more as a handicap than physical ones. Every brain injured person should be screened and repeatedly be carefully assessed for neuropsychiatric disorders and cognitive functioning at different time intervals in a close and trustful cooperation with the next of kin, especially the elderly patients. If patients show emotional adjustment problems one should discuss cautiously if the individual might benefit from psychotherapy. Different interventions should be applied without dogmatic focus on psychotherapeutic schools. The main aim of psychotherapy should be to teach the patients to behave in their own best self-interest to avoid chronic manifestation of mood disorders and to promote the patient's quality of life. We hope that our transdisciplinary contribution will help increase awareness of the potential role of psychotherapy in brain injured human beings, outlining the links between

denial, psychological distress, self-esteem, grief and loss of self-identities following brain injury (Coetzer, 2008; Haslam et al. 2008; Prigatano, 1991).

#### ***Corresponding author:***

*Klaus R.H. von Wild*

*Prof. Prof. h.c. Dr.med habil. Dr. h.c.*

*Frauenburgstrasse 32*

*48153 Münster, Germany*

*kvw@neurosc.de*

*Fon: +49.251.3977750*

*Fax +49.251.3977751*

#### **References**

1. Broomfield, N.M. Laidlaw, K. , Hickabottom, E., Murray, M.F., Pendrey, R., Whittick, J.E. & Gillespie, D.C. (2010). Post Stroke depression: the case for augmented, individually tailored cognitive behavioural therapy. *Clinical Psychology and Psychotherapy*. n/a.doi:10.1002/cpp 711.
2. Bullinger, M., Azouvi, P. Brooks, N., Basso, A., Christensen, A.L., gobiet, W., Greenwood, R., Hütter, B., Jenett, B., Maas, A., Truelle, J.L., von Wild, K.R. & TBI Consensus Group (2002). Quality of life in patients with traumatic brain injury-basic issues, assessment and recommendations. *Restorative Neurology Neuroscience* 20 (3-4), 111-24.
3. Carod-Artal, F. J. & Egido, J.A. (2009). Quality of life after stroke: the importance of a good recovery. *Cerebrovascular Diseases* 27 Suppl 1, 204-14.
4. Christensen, A-L. & Rosenberg, N.K. (1991). A critique of the role of psychotherapy in brain injury rehabilitation. *Journal of Head Trauma Rehabilitation*, 6(4), 56-61.
5. Christensen, A-L, Uzzel, B. (1988 ). *Neuropsychological Rehabilitation*, Kluwer Academic Publishers Boston Dordrecht London
6. Christensen A-L, Goldberg, E, Bougakov, D (2009). *Luria's legacy in the 21st century* Oxford University Press
7. Coetzer, R. (2007). Psychotherapy following traumatic brain injury: Integrating theory and practice. *Journal of Head Trauma Rehabilitation* 22 (1), 39-47.
8. Coetzer, R. (2008). Holistic neurorehabilitation in the community: is identity a key issue? *Neuropsychological Rehabilitation* 18 (5-6), 766-83.
9. Dafer, R. M., Rao, M. Shareef, A. & Sharma, A. (2008). Poststroke depression. *Topics in Stroke Rehabilitation*, 15(1), 13-21.
10. Donellan, C., Hickey, A., Hevey, D. & O`Neill, D.

- (2010). Effect of mood symptoms on recovery one year after stroke. *International Journal of Geriatric Psychiatry*, 25(12), 1288-95
11. Goldstein, K. (1948). *After effects of brain injuries in war: Their evaluation and treatment*. New York: Grune and Stratton.
12. Green, T. L. & King, K. M. (2010). Functional and psychosocial outcomes 1 year after mild stroke. *Journal of Stroke Cerebrovascular Diseases*, 19 (1), 10-16.
13. Hackett, M. L., Yapa, C., Parag, V. & Anderson, C. S. (2005). Frequency of depression after stroke: a systematic review of observational studies. *Stroke*, 36, 1330-40.
14. Hama, S., Yamashita, H., Shigenobu, M., Watanabe, A., Hiramoto, K., Kurisu, K. Yamawaki, S. & Kitaoka, T. (2007). Depression or apathy and functional recovery after stroke. *International Journal of Geriatric Psychiatry*, 22 (10) 1046-51.
15. Haslam, C., Holme, A., Haslam A., Iyer, A., Jetten, J. & Williams, W.H. (2008). Maintaining group membership: Social identity continuity predicts well-being after stroke. *Neuropsychological Rehabilitation*, 18 (5/6), 671-91.
16. Horowitz, M.J., Bonanno, G.A. & Holen, A. (1993). Pathological grief: diagnosis and explanation. *Psychosomatic Medicine* 55, 260-74.
17. Jorge, R. E., Starkstein, S. E. & Robinson, R. G. (2010). Apathy following stroke. *Canadian Journal of Psychiatry*, 55(6), 350-54.
18. Judd, D. & Wilson, S. L. (2005). Psychotherapy with brain injury survivors: an investigation of the challenges encountered by clinicians and their modification to therapeutic practice. *Brain Injury*, 19(6), 437-49.
19. Kirkevold, M. (2010). The role of nursing in the rehabilitation of stroke survivors: an extended theoretical account. *Advances in nurse science*, 33(1), 27-40.
20. Klonhoff, P.S. (2010). *Psychotherapy after brain injury: principles and techniques*. New York: The Guilford Press.
21. Lökk, J. & Delbari, A. (2010). Management of depression in elderly stroke patients. *Neuropsychiatric Disease and Treatment*, 7(6), 539-49.
22. Mynors-Wallis, L. M., Gath, D.H., Lloyd-Thomas, A.R. & Tomlinson, D. (1995). Randomised controlled trial comparing problem solving treatment with amitriptyline and placebo for major depression in primary care. *British Medical Journal*, 310, 441- 45.
23. Mynors-Wallis, L., Davies, I., Gray, A., Barbour, F. & Gath, D. (1997). A randomised controlled trial and cost analysis of problem-solving treatment for emotional disorders given by community nurses in primary care. *British Journal of Psychiatry*, 170, 113-19.
24. Olders, H. (1989). Mourning and grief as healing processes in psychotherapy. *Canadian Journal of Psychiatry* 34(4), 271-80.
25. Prigatano, G. P. (1991). Disordered mind, wounded soul: the emerging role of psychotherapy in rehabilitation after brain injury. *Journal of Head Trauma Rehabilitation*, 6(4), 1-10.
26. Prigatano, G. P. (1995). Strengths and limitations of psychotherapy after brain injury. *Advances in Medical Psychotherapy* 8, 23-34.
27. Prigatano, G.P. (1999). *Principles of neuropsychological rehabilitation*. New York: Oxford University Press.
28. Robinson, R.G. (2010). Neuropsychiatric disorders following stroke. *Canadian Journal of Psychiatry* 55(6), 339-40.
29. von Steinbüchel, N., Wilson, L., Truelle, J.L., Gibbons, H., Koskinen, S., Bakx, W., Bullinger, M., Formisano, R., Hawthorne, G., Maas, A., Neugebauer, E., Powell, J., Sarajuuri, J., Sasse, N., von Wild, K., Zitnay, G., and the QOLIBRI Group (2010). Quality of Life after Brain Injury (QOLIBRI) - Scale validity and correlates of quality of life. *Journal of Neurotrauma*, 27 (7):1157-65 .
30. West, R., Hill, K., Hewison, J., Knapp, P. & House, A. (2010). Psychological disorders after stroke are an important influence on functional outcomes: a prospective cohort study. *Stroke*, 41(8), 1723-27.
31. Whealan-Goodinson, R., Ponsford, J., Johnston, L. & Grant, F. (2009). Psychiatric disorders following traumatic brain injury: their nature and frequency. *Journal of Head Trauma Rehabilitation* 24,(5), 324-32.
32. Whelan-Goodinson, R., Ponsford J., Schönberger, M. & Johnston, L. (2010). Predictors of psychiatric disorders following traumatic brain injury. *Journal of Head Trauma Rehabilitation*, 25(5), 320-29.
33. Whyte, E. M., Mulsant, B. H., Vanderbilt, J., Dodge, H. H. & Ganguli, M. (2004). Depression after stroke: a prospective epidemiological study. *Journal of the American Geriatric Society*, 52(5), 774-78.
34. Wilson, B., Gracey, F. Evans, J. J. & Bateman, A. (2009). *Neuropsychological rehabilitation*. Cambridge: University Press.