

# Assessment of Long-Term Activity Limitations and Participation Restrictions of Persons with Traumatic Brain Injury Using the Disability Rating Scale

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## ABSTRACT

*The rehabilitation of patients with traumatic brain injury (TBI), or intracranial injury, is the most complex segment of rehabilitation. The majority of patients with TBI are young, and the consequences are temporary or permanent limitation of activities and participation. Rehabilitation is primarily carried out in special hospitals for medical rehabilitation, and occasionally continues with rehabilitation on an outpatient basis or in the patient's home. The question of when treatment and rehabilitation is complete is often posed. An investigation of 40 patients with TBI was conducted at the completion of hospital rehabilitation and again three to five years after the completion of hospital treatment to assess the disability rating scale (DRS). The average age of patients was 33 years at the time of occurrence of the TBI, and the great majority were male (90%). The follow-up survey was conducted at the patient's home, and only in a few cases in the Osijek University Hospital or the Krapinske Toplice Special Hospital for Medical Rehabilitation. The DRS is an assessment of the level of activity and participation through four components: arousability, awareness, responsivity; cognitive ability for self-care activities; dependence on others; psychosocial adaptability and total DRS. Statistical testing was conducted at a significance level of 95%, and data analysis was carried out on the licensed programme STATISTICA 6.1 (StatSoft inc. 1983–2003, license no. AGA304B211928E61). The Wilcoxon test was used to determine statistical differences. After three to five years, there were no cases of statistically significant worsening or improvement of arousability, awareness and responsivity (0.067890,  $p > 0.05$ ) or cognitive ability for self-care activities (0.108810,  $p > 0.05$ ). However, there was a statistically significant improvement in dependence on others (0.000012,  $p < 0.05$ ) and psychosocial adaptation (0.011719,  $p < 0.05$ ). The TBI patients in the study had statistically significant improvement of their activities and progression three to five years after the completion of hospital rehabilitation monitored using the DRS (0.000004,  $p < 0.05$ ). These results refer only to those patients who continued to live in a family environment. It is necessary to conduct further study to determine an improvement or worsening of activities and participation of patients with TBI who continued living outside a family (senior rest home, social care institute, private home for seniors and the disabled). The present study established that there is improvement in patients with TBI living in a family environment even three to five years after the completion of inpatient medical rehabilitation, particularly in the segments of dependence on others in activities of everyday life, education and employment.*

**Key words:** Disability rating scale, assessment, rehabilitation, traumatic brain injury

## Introduction

Traumatic brain injury (TBI) is caused by a physical force to the head area, resulting in brain injury. It can re-

sult in an altered state of awareness, reduction of cognitive abilities, neuro-motor abilities and inappropriate be-

haviour. The said changes can be either temporary or permanent and, depending on the severity can cause partial or complete reduction of activities and limitation of participation and psychosocial inadaptability<sup>1</sup>. In Croatia, about 900 patients with TBI require hospital rehabilitation, outpatient rehabilitation or home-based rehabilitation. The majority of patients with TBI are males under the age of 30 or over the age of 70. The rehabilitation of patients with severe TBI is, as a rule, a long-term process, and patients with similar structural brain injuries can have different problems, varying recovering times and outcomes of treatment and rehabilitation<sup>3</sup>. Upon completion of acute treatment, if required, treatment and rehabilitation continues in hospital, on an outpatient basis or in the patient's home. The ultimate objective of treatment and rehabilitation is to maximize activity and participation. A share of patients requires life-long care and assistance of others following treatment and rehabilitation<sup>4</sup>. The objective of rehabilitation of the elderly should be directed at establishing independence in the home<sup>5</sup>. The most significant consequence of damage to different body systems that reduces the level of satisfaction in the patient's life is the limitation of participation in everyday activities<sup>6</sup>. The question is posed as to whether following the completion of hospital rehabilitation, the process of rehabilitation of patients with TBI is completed and final, or whether further changes, either improvements or worsening, can be expected. How many patients following TBI continue living as they did before the injury, and how many remain more or less dependent on others after leaving the »artificial« conditions of the rehabilitation centre? Most studies in this area are conducted within the medical rehabilitation facilities, and rarely do they address life in the patient's

home, several years after occurrence of the TBI. To assess the presence of changes to the activity and participation in patients with TBI, the Disability Rating Scale (DRS) is often used. The World Health Organisation (WHO) has developed a system of international classification of functioning which has brought a change to the names of classification. The classification of invalidity has been changed to reduced activity and the classification of handicapped has been changed to limited participation<sup>7</sup>. The DRS has been developed and tested on adults with moderate and severe traumatic brain injury. The advantage of the DRS system is that it allows for the monitoring of patients from a vegetative state to rehabilitation in the community. The limitation of DRS is its relative insensitivity in cases of moderate TBI, and inability to register more subtle and oftentimes significant changes within a specific and occasionally limited framework of recovery<sup>8</sup>.

### Subjects and Methods

The study was conducted on 40 patients (4 women, 36 men) who suffered traumatic brain injury in the period from 2003 and 2005 and were admitted to inpatient medical rehabilitation at Special Hospital Krapinske Toplice. The study was carried out after hospital rehabilitation at Krapinske Toplice and repeated three to five years after the completion of inpatient rehabilitation at the patients' homes, at the University Hospital Center Osijek and Special Hospital for Medical Rehabilitation Krapinske Toplice. Patients or their immediate family members (if the patients were not capable of making verbal contact) answered the questions of the DRS. All patients surveyed or their legal caregivers signed a consent form

**TABLE 1**  
DISABILITY RATING SCALE

Category	Item	Instructions	Score
Arousability Awareness Responsivity	Eye opening	0=spontaneous, 1=to speech, 2=to pain, 3=none	
	Communication ability	0=oriented, 1=confused, 2=inappropriate, 3=incomprehensible, 4=none	
	Motor response	0=obeying, 1=localizing, 2=withdrawing, 3=flexing, 4=extending, 5=none	
Cognitive ability for self-care activities	Feeding	0=complete, 1=partial, 2=minimal, 3=none	
	Toileting	0=complete, 1=partial, 2=minimal, 3=none	
	Grooming	0=complete, 1=partial, 2=minimal, 3=none	
Dependence on others	Level of functioning	0=completely independent, 1=independent in special environment, 2=mildly dependent, 3=moderately dependent, 4=markedly dependent, 5=totally dependent	
Psychosocial adaptability	Employability	0=not restricted, 1=selected jobs, 2=sheltered workshop (non-competitive), 3=not employable	
Total disability rating score			

for participation in the survey. The results of the DRS upon completed hospital rehabilitation were compared with those taken three to five years after the completion of hospital rehabilitation. Furthermore, the results of individual components of the DRS were compared. The DRS assesses the level of activity and participation through four components. The first component is the assessment of arousability, awareness and responsiveness. The second component assesses the cognitive ability for in self-care activities. The third component assesses the patient's dependence on others, while the fourth component is an assessment of psychosocial adaptability (Table 1). Maximum reduction of activity and limited participation is present in the patient if the number of points is from 25 to 29, and reduced activity and limited participation is not present if the number of points in the DRS is zero<sup>9</sup> (Table 2). Statistical testing was conducted at a signifi-

**TABLE 2**  
LIMITATION IN ACTIVITY AND PARTICIPATION ESTIMATED WITH DISABILITY RATING SCALE

Total disability rating score	Level of disability
0	None
1	Mild
2-3	Partial
4-6	Moderate
12-16	Severe
17-21	Extremely Severe
22-24	Vegetative state
25-29	Extreme vegetative state

cance level of 95% ( $\alpha=0.05$ ). Data processing and analyses were conducted using the licensed programme STATISTICA 6.1 (StatSoft inc. 1983–2003, licence no: AGA304B211928E61). Due to the fact that the data is based on points system, the data are not normally distributed, and therefore the Wilcoxon test was used to test the significant differences. This is a non-parametric test analogous to the t-test for independent samples when the data are normally distributed. Explanation of individual components of the DRS:

#### *Disability Rating Scale (DRS)*

Because various items in the Disability Scale (DRS) address all three World Health Organization categories: impairment, disability and handicap, the DRS is able to measure across the span of recovery to track an individual from coma to community.

The first three items of the DRS (»Eye Opening«, »Communication Ability« and »Motor Response«) are a slight modification of the Glasgow Coma Scale (Teasdale and Jennett, 1974), and reflect impairment ratings. Cognitive ability for »Feeding«, »Toileting« and »Grooming« reflect level of disability. The »Level of Functioning« item is the modification of a measure used by Scranton et

al. (1970), and reflects handicap, as does the last item, »Employability«.

#### *Interpreting the Score*

The maximum score a patient can obtain on the DRS is 29, which represents an extreme vegetative state. A person without disability would score zero. For the DRS to be reliable, it must be employed when the individual is free from the influence of anaesthesia, other mind-altering drugs, recent seizure, or recovery from surgical anaesthesia. The DRS can be self-administered or scored through an interview with the patient or family member. The ease of scoring and the brevity of the scale are compelling reasons for its popularity. Scoring time can range from 30 seconds (if one is very familiar with the scale and the client) to 15 minutes, assuming the rater must interview the client/family and seek additional information from available staff. An additional advantage is the ease and brevity with which information can be obtained by phone interview. Although not optimum, DRS ratings can even be obtained retrospectively in certain cases by a medical record review. Another advantage of the DRS is that expertise in the field is not needed to complete it accurately. A limitation of the DRS is its relative insensitivity at the low end of the scale (mild TBI) and its inability to reflect more subtle but sometimes significant changes in an individual within a specific, limited window of recovery.

#### *DRS Terms and Definitions*

**Eye Opening:** 0. Spontaneous: eyes open with sleep/wake rhythms indicating active and arousal mechanisms; does not assume awareness. 1. To speech and/or sensory stimulation: a response to any verbal approach, whether spoken or shouted, not necessarily the command to open the eyes; also, response to touch, mild pressure. 2. To pain: tested by a painful stimulus (standard painful stimulus is the application of pressure across the index fingernail of best side with wood or a pencil; for quadriplegics pinch nose tip and rate as 0, 1, 2 or 5.) 3. None: no eye opening even to painful stimulation.

#### *Best Communication Ability*

If patient cannot use voice because of tracheostomy or is aphasic or dysarthric or has vocal cord paralysis or voice dysfunction, then estimate the patient's best response and enter note under comments. 0. Oriented: implies awareness of self and the environment. Patient able to tell you a) who he is; b) where he is; c) why he is there; d) year; e) season; f) month; g) day; h) time of day. 1. Confused: attention can be held and patient responds to questions but responses are delayed and/or indicate varying degrees of disorientation and confusion. 2. Inappropriate: intelligible articulation but speech is used only in an exclamatory or random way (such as shouting and swearing); no sustained communication exchange is possible. 3. Incomprehensible: moaning, groaning or sounds without recognizable words; no consistent communication signs. 4. None: no sounds or communication signs from patient.

### Best Motor Response

0. Obeying: obeying command to move finger on best side. If no response or not suitable try another command such as »move lips«, »blink eyes« etc. Do not include grasp or other reflex responses. 1. Localizing: a painful stimulus at more than one site causes a limb to move (even slightly) in an attempt to remove it. It is a deliberate motor act to move away from or remove the source of noxious stimulation. If there is doubt as to whether withdrawal or localization has occurred after three or four painful stimulations, rate as localization. 2. Withdrawing: any generalized movement away from a noxious stimulus that is more than a simple reflex response. 3. Flexing: painful stimulation results in either flexion at the elbow, rapid withdrawal with abduction of the shoulder or a slow withdrawal with adduction of the shoulder. If there is confusion between flexing and withdrawing, then use pin prick on hands, then face. 4. Extending: painful stimulation results in extension of the limb. 5. None: no response can be elicited; usually associated with hypotonia. Exclude spinal transection as an explanation of lack of response; be satisfied that an adequate stimulus has been applied.

### Cognitive Ability for Feeding, Toileting and Grooming

Rate each of the three functions separately. For each function answer whether the patient shows awareness of how and when to perform each specified activity. Ignore motor disabilities that interfere with carrying out a function; this is rated under Level of Functioning described below. Rate best response for toileting based on bowel and bladder behaviour. Grooming refers to bathing, washing, brushing of teeth, shaving, combing or brushing of hair and dressing. 0. Complete: continuously shows awareness that he knows how to feed, toilet or groom self and can convey unambiguous information that he knows when this activity should occur. 1. Partial: intermittently shows awareness that he knows how to feed, toilet or groom self and/or can intermittently convey reasonably clearly information he knows when the activity should occur. 2. Minimal: shows questionable or infrequent awareness that he knows in a primitive way how to feed, toilet or groom self and/or shows infrequently by certain signs, sounds or activities that he is vaguely aware when the activity should occur. 3. None: shows virtually no awareness at any time that he knows how to feed, toilet or groom self and cannot convey information by signs, sounds, or activity that he knows when the activity should occur.

### Level of Functioning

0. Completely independent: able to live as he wishes, requiring no restriction due to physical, mental, emotional or social problems. 1. Independent in special environment: capable of functioning independently when needed requirements are met (mechanical aids). 2. Mildly dependent: able to care for most of own needs but requires limited assistance due to physical, cognitive and/

or emotional problems (e.g. needs non-resident helper). 3. Moderately dependent: able to care for self partially but needs another person at all times. 4. Markedly dependent: needs help with all major activities and the assistance of another person at all times. 5. Totally dependent: not able to assist in own care and requires 24-hour nursing care.

### Employability

The psychosocial adaptability or »employability« item takes into account overall cognitive and physical ability to be an employee, homemaker or student. This determination should take into account considerations such as the following: 1. Able to understand, remember and follow instructions; 2. Can plan and carry out tasks at least at the level of an office clerk or in simple routine, repetitive industrial situations or can do school assignments; 3. Ability to remain oriented, relevant and appropriate in work and other psychosocial situations; 4. Ability to get to and from work or shopping centres using private or public transportation effectively; 5. Ability to deal with number concepts; 6. Ability to make purchases and handle simple money exchange problems; 7. Ability to keep track of time schedules and appointments. 0. Not restricted: can compete in the open market for a relatively wide range of jobs commensurate with existing skills; or can initiate, plan, execute and assume responsibilities associated with homemaking; or can understand and carry out most age relevant school assignments. 1. Selected jobs, competitive: can compete in a limited job market for a relatively narrow range of jobs because of limitations of the type described above and/or because of some physical limitations; or can initiate, plan, execute and assume many but not all responsibilities associated with homemaking; or can understand and carry out many but not all school assignments. 2. Sheltered workshop, non-competitive: cannot compete successfully in job market because of limitations described above and/or because of moderate or severe physical limitations; or cannot without major assistance initiate, plan, execute and assume responsibilities for homemaking; or cannot understand and carry out even relatively simple school assignments without assistance. 3. Not employable: completely unemployable because of extreme psychosocial limitations of the type described above; or completely unable to initiate, plan, execute and assume any responsibilities associated with homemaking; or cannot understand or carry out any school assignments.

## Results

In the study, 40 patients participated voluntarily: 36 men (90%) and only four women (10%), with an average age of 33 years. Acute treatment lasted an average of 58 days (from 18 to 248 days), after which time hospital medical rehabilitation continued at the Special Rehabilitation Hospital Krapinske Toplice, and lasted for an average of 140 days (21 to 300 days).

**TABLE 3**  
DISABILITY RATING SCALE RESULTS OF EXAMINATION

Case number	Arousability, awareness and responsivity		Cognitive ability for self-care activities		Dependence on others and level of functioning		Psychosocial adaptability and employability		Total score	
	I. score	II. score	I. score	II. score	I. score	II. score	I. score	II. score	I. score	II. score
1.	3	0	5	0	5	4	3	2	16	6
2.	1	1	4	3	4	3	3	3	12	10
3.	0	0	2	2	3	2	3	3	8	7
4.	5	5	8	8	5	5	3	3	21	21
5.	0	0	0	0	3	2	3	2	6	4
6.	0	0	0	0	3	2	2	2	5	4
7.	0	0	0	0	3	2	2	2	5	4
8.	0	0	0	0	3	2	3	2	6	4
9.	0	0	0	0	2	0	1	0	3	0
10.	0	0	0	0	4	2	3	2	7	4
11.	0	0	0	0	3	2	2	2	5	4
12.	9	8	8	8	5	5	3	3	25	24
13.	0	0	0	0	3	2	2	2	5	4
14.	0	0	0	0	3	2	2	2	5	4
15.	11	11	9	9	5	5	3	3	28	28
16.	0	0	5	5	4	4	3	3	12	12
17.	0	0	0	0	1	1	2	2	3	3
18.	0	0	0	0	3	2	2	1	5	3
19.	0	0	0	0	4	2	2	1	6	3
20.	0	0	0	0	2	0	1	0	3	0
21.	0	0	3	3	5	5	3	3	11	11
22.	0	0	1	1	3	2	3	3	7	6
23.	0	0	1	0	4	3	3	3	7	6
24.	0	0	1	1	2	1	3	3	6	5
25.	0	0	5	5	5	5	3	3	13	13
26.	0	0	1	1	2	2	3	3	6	6
27.	2	2	5	5	5	5	3	3	15	15
28.	0	0	0	0	4	3	3	3	7	6
29.	0	0	0	0	3	2	3	3	6	5
30.	0	0	0	0	1	0	2	2	3	2
31.	0	0	0	0	1	0	3	3	4	3
32.	0	0	0	0	3	2	2	2	5	4
33.	0	0	0	0	3	2	2	2	5	4
34.	0	0	0	0	3	3	3	3	6	6
35.	4	3	6	6	5	5	3	3	18	17
36.	0	0	0	0	4	3	3	3	7	6
37.	0	0	0	0	3	3	2	2	5	5
38.	2	1	3	3	4	4	3	3	12	11
39.	0	0	7	7	5	5	3	3	15	15
40.	5	5	8	8	5	5	3	3	21	21

Upon treatment and rehabilitation, recovery was observed in neuro-motor and cognitive function, behavioural and emotional status (Table 3). Upon arrival at the medicinal rehabilitation hospital, the Glasgow Outcome Scale (GOS) corresponded to a persistent vegetative state in seven patients, while at the end of rehabilitation, only two of those patients continued to be in a vegetative state. The state of thirteen patients at the start of inpatient medical rehabilitation corresponded to serious incapacity, while upon their discharge only nine of these patients remained in this category. A total of twelve pa-

tients were categorised as having moderately severe incapacity at the start of rehabilitation, which was increased to a total of 17 patients at the end of rehabilitation. Only one patient was in the category of well recovered at the onset of rehabilitation, while five patients were considered well recovered at the end of treatment. Data on the course of recovery during rehabilitation in the GOS were not available for seven patients.

The total DRS of patients with TBI in the period three to five years after the completion of inpatient medical rehabilitation indicative progressive improve-

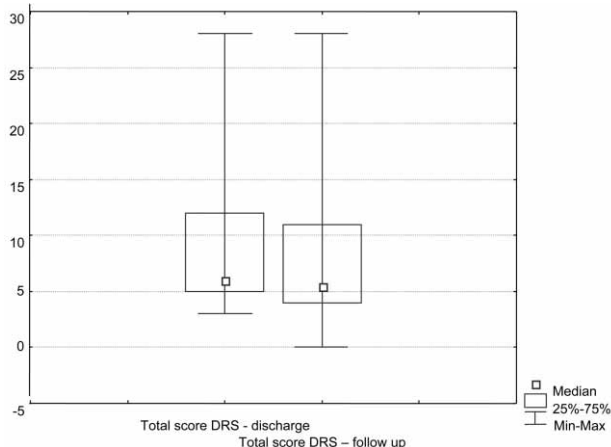


Fig. 1. Total disability rating scale (DRS) is significantly improved at follow up 3-5 years after completion of hospital rehabilitation. Wilcoxon matched pairs test are significant at 0.000004,  $p < 0.05$ .

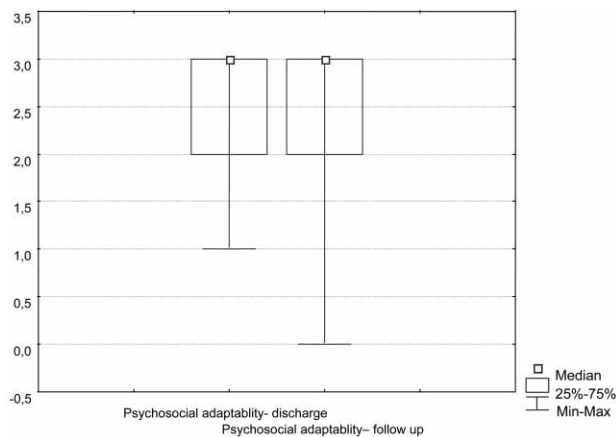


Fig. 2. Psychosocial adaptability follow-up with disability rating scale. At the follow-up 3-5 years after the completion of hospital rehabilitation, the number of patients with the capacity to be an employee, homemaker or student is increased. Wilcoxon matched pairs test are significant at 0.011719,  $p < 0.05$ .

ment (Figure 1). Statistically significant progressive improvement in activity and participation in patients was confirmed in the period three to five years after the completion of hospital treatment of patients with TBI (0.000004,  $p < 0.05$ ). In patients who continued to live in a family environment following rehabilitation, improved employability or continued education was registered three to five years after the completion of hospital rehabilitation. The minimum number of points in this segment of the DRS was 0 (no limitations) and the maximum number of points is 3 (incapable of employment and education). At the time of their discharge, the majority of patients were in the range from 1 to 3 points, while three to five years after the end of rehabilitation, some patients had become free of limitations. A statistically significant progression of improvement of the psychosocial adaptation was seen in patients (0.011719,  $p < 0.05$ ), i.e. capabil-

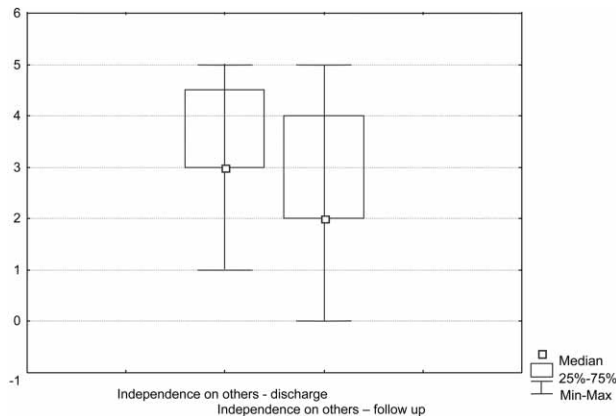


Fig. 3. Independence from others in activities of daily living has improved in the follow-up. Wilcoxon matched pairs test are significant at 0.000012,  $p < 0.05$ .

ity of employment and education (Figure 2). The component of the DRS that analyses independence from others in activities of daily life (ADL) three to five years after the completion of treatment also indicated progressive improvement. The minimum number of points in this segment of the DRS is 0 and the maximum is 5. Upon their discharge from inpatient rehabilitation, patients had an average rating in the group of moderate level of independence, while after three to five years, the average was in the group of mild dependence in ADL. Analysis of the data indicated a statistically significant progressive improvement of independence from others (0.000012,  $p < 0.05$ ) in patients (Figure 3). There was no progressive improvement of the components of DRS assessing arousability, awareness and responsivity (0.067890,  $p > 0.05$ ) and cognitive ability for self-care activities (0.108810,  $p > 0.05$ ).

## Discussion and Conclusion

Today, there are increasing numbers of studies aimed at establishing the short-term and long-term changes in

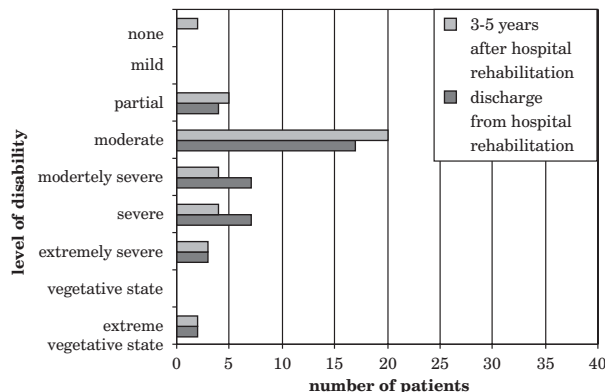


Fig. 4. Results of the total disability rating scale upon discharge from hospital rehabilitation, and 3-5 years after completion of hospital rehabilitation.

functionality in patients following TBI. Various indicators are used in the evaluation, such as the GOS, Glasgow Coma Scale (GCS), DRS, and Functional independent measure (FIM). Hall showed that the DRS is relatively sensitive in researching the long-term outcome of treatment and rehabilitation in patients with TBI<sup>8</sup>. In comparison with the results obtained by Jennet, it is evident that there was greater sensitivity and significant progress in the recovery of patients assessed using the DRS in comparison to those patients assessed using the GOS<sup>8</sup>. The findings of Rappaport, who claimed that the patients who arrived sooner at rehabilitation in comparison to those who were taken to rehabilitation later following the head injury experienced significantly improved recovery. There is also the opinion that success in patients undergoing rehabilitation soon is greater is that they had less severe injuries to start with, making their acute treatment shorter. The longer the acute treatment, the more severe the TBI and, ultimately, the longer the rehabilitation and poorer recovery, which is also corroborated by the present study<sup>9</sup>. The majority of studies are carried out in facilities for medical rehabilitation and are rarely conducted in patient homes several years after the completion of treatment and rehabilitation of persons with TBI. The present study was aimed at establishing if there is progressive improvement or worsening of the functional state of patients continuing to live in a family environment three to five years after the completion of hospital medical rehabilitation. The present study applied the DRS scale, which has been developed and tested on adults with TBI, and assesses the level of activity and participation. The criteria for inclusion in the study were that patients underwent inpatient medical rehabilitation at the Krapinske Toplice Special Hospital for Medical Rehabilitation between 2003 and 2005. The registered share of men to women is highly correlated with the incidence of men to women among patients with TBI, and this concurs with several studies conducted in Croatia<sup>2</sup>. In the components of the DRS analysing arousability, awareness and responsivity, and cognitive ability for self-care activities, no statistically significant difference was found among patients in the period following the completion of inpatient medical rehabilitation and the check-ups made three to five years later. Considering that this segment of the DRS correlates to the Glasgow Coma Scale, no worsening is expected unless the brain injury is repeated. In the remaining components of the DRS, there was statistically significant improvement in

the functional status of patients following the completion of acute hospital treatment and inpatient medical rehabilitation that had an average duration of 198 days. Considering that progressive improvement of patients was confirmed after three to five years following the completion of hospital rehabilitation, then the question of whether or not rehabilitation for patients with TBI on an outpatient basis or at home should be continued must be answered positively. This is particularly important for young people, aimed at allowing them to continue their education and enable their employment. For the elderly, the continuation of rehabilitation on an outpatient basis or at home is important for their becoming independent in activities of daily life and their independence from others. In analysing the total DRS, it was confirmed that even after three to five years following the completion of acute treatment and rehabilitation, there is the possibility for statistically significant improvement in the functional status of patients, particularly in the areas of dependence on others and in psychosocial adaptation, which in the long-term is correlated to improved integration of patients with TBI, both in their family life and in the community (Figure 4). The results of the present study agree with the results of other studies on this topic, and thus the DRS can be considered sufficiently sensitive to assess and register general changes during post-TBI recovery<sup>8</sup>.

These facts apply to patients with TBI continuing their treatment and care in a family environment. In order to establish the changes present in persons with TBI who are placed in social institutions or homes following inpatient medical rehabilitation, it would be necessary to conduct a similar study using the same methods. This would then establish how important the function of the family is in the progressive recovery of the person with TBI following the completion of inpatient medical rehabilitation. The results of this study indicate that three to five years after the end of inpatient medical rehabilitation, there is the possibility of progressive recovery of activity and participation of patients with TBI continuing to live in the family in which they lived prior to the injury. According to the DRS, the majority of patients included in this study are now in the category of moderate reduction of activity and participation, while at the time of their discharge from inpatient rehabilitation, they were in the categories from moderate to severe reduction of activity and participation.

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## **PROCJENA DUGOROČNOG SMANJENJA AKTIVNOSTI I PARTICIPACIJE SKALOM ONESPOSOBLJENJA U OSOBA S TRAUMATSKOM OZLJEDOM MOZGA**

### **SAŽETAK**

Rehabilitacija osoba s traumatskim oštećenjem mozga (TOM) najsloženiji je segment rehabilitacije. Većinu osoba s TOM čine mladi ljudi, a posljedice su privremeno ili trajno smanjenje aktivnosti i participacije. Rehabilitacija se provodi primarno u specijalnim bolnicama za medicinsku rehabilitaciju, a ponekad je potrebno nastaviti s rehabilitacijom ambulantno ili u kući bolesnika. Često se postavlja pitanje, kada je liječenje i rehabilitacija završena? Ispitivanjem 40 osoba s TOM nakon završene bolničke rehabilitacije i 3–5 godina nakon završene bolničke rehabilitacije provedena je procijena aktivnosti i participacije skalom onesposobljenja (DRS). Prosječna dob ispitanika je bila 33 godine u trenutku nastanka TOM, a većinom se radilo o muškarcima (90%). Ispitivanje je uglavnom provedeno u domovima bolesnika, a rijeđe u Kliničkoj bolnici Osijek ili u Specijalnoj bolnici za medicinsku rehabilitaciju u Krapinskim Toplicama. DRS je procjenjivana razina aktivnosti i participacije kroz 4 komponente: Podražljivost, svjesnost, reaktivnost. Kognitivne sposobnosti u aktivnostima samozbrinjavanja. Neovisnost o drugima. Psihosocijalna prilagodba i ukupni DRS. Statističko testiranje je provedeno na razini značajnosti od 95%, a obrada i analiza podataka je izvršena licenciranim programom STATISTICA 6.1 StatSoft inc. 1983–2003, serijski broj AGA304B211928E61. Za testiranje statističke razlike korišten je Wilcoxonov test. 3–5 godina nakon završene bolničke rehabilitacije nije došlo do statistički značajnijeg poboljšanja podražljivosti, svjesnosti, reaktivnosti (0,067890,  $p > 0,05$ ) i kognitivnih sposobnosti u aktivnostima samozbrinjavanja (0,108810,  $p > 0,05$ ). Došlo je do statistički značajnijeg poboljšanja neovisnosti o drugima (0,000012,  $p < 0,05$ ) kao i psihosocijalne prilagodbe (0,011719,  $p < 0,05$ ). U ispitanika s TOM je utvrđena statistički značajna progresija poboljšanja aktivnosti i participacije 3–5 godina nakon završene bolničke rehabilitacije praćene DRS (0,000004,  $p < 0,05$ ). Ovi se rezultati odnose samo na bolesnike koji su nastavili živjeti u obiteljskom okruženju. Potrebno je provesti istraživanje kako bi se utvrdilo poboljšanje ili pogoršanje aktivnosti i participacije osoba s TOM koji su nastavili život van obitelji (dom umirovljenika, ustanove socijalne skrbi, privatni domovi za stare i nemoćne). Ovim istraživanjem je utvrđeno da postoji oporavak osoba nakon TOM u obiteljskom okruženju i 3–5 godina nakon završetka stacionarne medicinske rehabilitacije, osobito u segmentu neovisnosti o drugim osobama u aktivnostima svakodnevnog života, školovanju i zapošljavanju.