

Clinical Neuropsychology and Brain Injury Rehabilitation in Israel: A Twenty-Year Perspective

Eli Vakil¹

The development of the field of neuropsychology in Israel is primarily the result of the development of rehabilitation services for traumatic brain-injured patients. The responsibility to care for and help disabled veterans has always been an important motivation for the establishment of rehabilitation services. Israel is probably one of the first countries in the world to develop community-based services specifically designed to address the needs of young patients with severe traumatic brain injury. The fairly extensive therapeutic and community services available today for both military and civilian brain-injured persons in Israel are the result of initiatives and funding by the Israel Ministry of Defense's Department of Rehabilitation. There are two principles that characterize most of the programs in Israel: (1) multidimensional remedial intervention and (2) life-time commitment to provide support. The accessibility of patients in a small country enables professionals to conduct follow-up studies in order to evaluate the long-term effects of brain injury. Current developments in neuropsychology are in three directions. First, formal training programs in neuropsychology are being set up. Second, the involvement of neuropsychologists is being extended beyond the treatment of young patients suffering from traumatic brain injury to include the treatment of different brain pathologies in children and the elderly. Third, sophisticated neuroimaging techniques are being applied to studies in cognitive neuropsychology.

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¹Psychology Department, Bar-Ilan University, Ramat-Gan, 52900, Israel.

ORIGINS AND DEVELOPMENT OF NEUROPSYCHOLOGY

This paper describes the development of neuropsychology in Israel over the last 20 years, as a reflection of the development of rehabilitation services for head-injured patients. The need to help disabled veterans has always been an important motivation for the establishment of rehabilitation services. Israel is a small country with an army composed of civilians who, when injured as part of their regular army service, require clinical attention. Injured veterans are treated as national heroes and demand high-priority treatment. Consequently, a great deal of thought and effort goes into their care. The fairly extensive therapeutic community services available today for both military and civilian brain-injured persons are the result of initiatives and funding by the Israel Ministry of Defense's Department of Rehabilitation. Thus, neuropsychology in Israel is closely linked to rehabilitation efforts.

The very large number of traumatic brain-injured (TBI) veterans following the 1973 Yom Kippur War led to a decision to designate the Loewenstein Hospital as the major rehabilitation center for TBI patients in Israel. In retrospect, this decision was very sound, since it enabled the training of highly specialized staff in all disciplines, and it assured proper equipment for the hospital: the end result is that patients receive better treatment. The Loewenstein Rehabilitation Center currently serves about 300 children, adults, and elderly patients suffering from TBI, stroke, degenerative diseases, and spinal cord injuries, and includes a department for patients in prolonged comatose states. Thus, the center treats patients from unconsciousness until the stage when they are ready to return to society, after which they receive follow-up care in the hospital's day care center. This intensive therapeutic relationship over many years of follow-up produced some of the pioneering studies of the long-term effects of TBI both on the patients and on the patients' families (Najenson *et al.*, 1974; Groswasser *et al.*, 1977; Najenson *et al.*, 1980).

Subsequent sections will focus on specialized treatment services in the postacute or "chronic" stage of the recovery process. The history of these services probably dates back to 1968, when three Israeli head-injured soldiers were sent by the Israel Ministry of Defense's Department of Rehabilitation for assessment and recommendations to the Rusk Institute for Rehabilitation Medicine at New York University. After the Yom Kippur War (1973), Professors Yehuda Ben-Yishay and Leonard Diller of the Rusk Institute visited the Loewenstein Hospital at the invitation of the Israel Ministry of Defense's Department of Rehabilitation. A joint pilot study was decided upon, working in collaboration with 15 TBI veterans.

In 1975, Professor Yehuda Ben-Yishay came to Israel with a number of his New York staff for one year to help set up, together with local professionals, community programs for the rehabilitation of veterans with TBI. Consequently, a number of other programs for rehabilitation of TBI at the postacute stage were developed in the country. Each of these centers developed its own unique rehabilitation approach and philosophy.

These programs are as follows:

1. The Day Care Center of the Loewenstein Rehabilitation Hospital. A description of the therapeutic rationale of this center is found in Stern (1991) and Groswasser and Stern (1990).
2. The National Institute for Rehabilitation of the Brain Injured—Recanati Rehabilitation Center. It is this center's program that most closely resembles the head trauma program at Rusk Institute for Rehabilitation Medicine at New York University. The major aspects shared by these two programs is their structure and intensive schedule (five days a week for ten months in Israel, four days a week for five months in New York). A description of the therapeutic rationale in this center is found in Hoofien *et al.* (1991), Vakil and Sheleff (1990), Guggenheim and Lesser (1990), and Becker and Vakil (1993).
3. The Neuropsychological Unit for Treatment and Rehabilitation—Givatayim. A description of the therapeutic rationale in this center is found in Gross and Schutz (1986), Gross (1982), and Klag *et al.* (1991).

These programs basically serve the same patient population: primarily young TBI patients with a potential to return to the community and find a job in the open market (although usually a compromise when compared with their preinjury jobs). In order to achieve these goals, patients require some or all of the following interventions: psychotherapy, cognitive remediation, family therapy, and vocational counseling. Thus, these programs are viewed by both staff and patients as a transitional period for preparing patients to return to society. Nonetheless, some patients need to be followed for many years, and they require support and guidance in order to function in society.

There is another group of TBI patients who do not fall into the above category. These are patients with very severe head injuries and major physical, behavioral, emotional, or cognitive problems that prevent them from returning to employment in the open market. This patient group requires a framework that provides a permanent rather than a transitional solution to their problems. For this reason the programs described above cannot provide an appropriate answer for this particular group of TBI patients.

In 1972 the Ministry of Defense's Department of Rehabilitation approached the Rehabilitation Psychology Program of the Department of Psychology at Bar-Ilan University to set up a program for these severely brain-injured veterans. In order to evaluate its feasibility, this program was initially a research project. Once it had demonstrated very positive results, the center was retained as a permanent service for severely brain-injured veterans (Katz *et al.*, 1978). The general structure of the center resembles a sheltered workshop and two principles served as guidelines for the development of the workshop program. The first was meaningful activity; the second was autonomy. Thus, both vocational and social needs were addressed. A multidisciplinary team utilizing a variety of activities has endeavored quite successfully to implement these principles in order to improve patients' quality of life.

Behavioral neurology and neuropsychology are to be found at Herzog Hospital in the department of neurogeriatrics. Clinics serve the neuropsychological needs of the general population as well as the elderly. A more detailed description of this center may be found in Katz (1991).

The three programs described above now serve civilians as well as veterans through the support of the National Insurance Institute. However, the sheltered workshop serves only veterans. Civilians with severe TBI who need a similar service are placed in sheltered workshops together with other patient groups such as mentally retarded or psychiatric patients. Although the workshop for persons with severe brain damage serves only veterans, the policy of developing and implementing neuropsychological rehabilitation systems to meet the needs of persons who are relatively less severely brain damaged and those who are more severely brain damaged may be a unique innovation of Israeli rehabilitation.

Notwithstanding the many differences between these programs, they do share some basic similarities. This is probably due to the fact that all the programs were developed in the same small country, coping with similar problems within the same system. Furthermore, most of the senior staff members of all these programs know each other very well; some have even worked together at one stage or another and have had many opportunities to exchange views.

There are two principles that characterize most of the programs in Israel:

1. *Multidimensional remedial intervention or a holistic approach.* The programs are organized and operated as a mini "therapeutic community" in order to address the different domains affected by the injury (i.e., cognition, emotions, family, social-behavioral, and vocational issues).

2. *Lifetime commitment to provide support.* A small country like Israel can afford taking such a responsibility upon itself. Once patients join the program they know that the staff will always be available when needed.

To summarize this section, Israel is probably one of the first countries in the world to develop community-based services specifically designed to address the needs of severe TBI patients. An overview of programs and services in Israel may be found in Katz and Florian (1991).

EDUCATION AND TRAINING

The need for rehabilitation services has led to a situation where many psychologists practicing clinical-rehabilitation neuropsychology have no formal training in neuropsychology but have rich clinical experience. This clinical experience is shared among professionals from different disciplines in the country (e.g., physicians, psychologists, occupational therapists, speech therapists, and social workers) through workshops offered by the different centers. This knowledge and experience is also shared outside of Israel when senior professionals are invited to give workshops on clinical-rehabilitation neuropsychology in different countries (e.g., Australia and Italy).

Another way of exchanging knowledge is by organizing international conferences such as that organized by the National Institute for Rehabilitation of the Brain Injured-Recanati Rehabilitation Center in 1987. The proceedings of that conference were later published (Vakil *et al.*, 1990).

Recently, additional formal training in neuropsychology has begun to emerge. Graduate programs in neuropsychology have been established at the Hebrew University in Jerusalem and graduate courses in clinical neuropsychology and neuropsychological assessment are offered in the rehabilitation program of the psychology department at Bar-Ilan University. Introductory courses in neuropsychology are given in almost every university, medical school, and departments of psychology and occupational therapy.

RESEARCH

Research is conducted practically with every patient population that has neuropsychological consequences, such as patients with TBI, cerebrovascular accident (CVA), Parkinson's disease, and Alzheimer's disease.

Different centers have particular interests in phenomena such as neglect, aphasia, and amnesia.

One of the unique areas of research in Israel may be the follow-up studies to evaluate the long-term effects of brain injury. The accessibility of patients in a small country such as Israel enables professionals to conduct such lengthy longitudinal studies. Loewenstein Rehabilitation Center formed a special unit to follow their patients and the results of these studies have been reported (Najenson *et al.*, 1974; Groswasser *et al.*, 1977; Najenson *et al.*, 1980). The National Institute for Rehabilitation of the Brain Injured-Recanati Rehabilitation Center has also been following its patients for an extended period of time (Hoofien *et al.*, 1990).

FUTURE DIRECTIONS

In general, there has been a very clear trend in the country over the past few years to recognize the potential of neuropsychology in the assessment and management of different patient groups. It is quite common to find neurologists with training in behavioral neurology in various hospital neurology departments and it is also not unusual to find neuropsychologists in pediatric and geriatric hospital departments as well.

Current developments are in three directions:

First, formal training programs in neuropsychology are being developed, so that the younger generation of neuropsychologists will have not only rich clinical experience but also a theoretical and conceptual basis that will eventually lead to more empirical studies in the field.

Second, the involvement of neuropsychologists is being expanded from the treatment of young TBI patients to include the treatment of different brain pathologies at different ages (e.g., CVA, demented patients, children, and psychiatric patients).

Third, sophisticated neuroimaging techniques such as position emission tomography scan and functional magnetic resonance imaging are being applied to studies in cognitive neuropsychology.

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