ABSTRACT. It has been suggested that external factors, such as perceived control of life and social support, influence the interactions of impairment, disability and handicap in the WHO model. Therefore, we assessed the effect of these two factors on the relationships between disability, handicap and quality of life in patients recovering from stroke. One hundred individuals, retrospectively and randomly selected from participants in an inpatient stroke rehabilitation program, were tested one year after discharge, using the Functional Independence Measure, the London Handicap Scale, the Life Satisfaction Assessment, the Tel-Aviv Social Support Instrument, and the Perceived Stress Scale. Impairment, disability, handicap and quality of life after stroke correlated positively and significantly with each other. Significant moderation of the influence that disability exerts on handicap was affected by perception of control, and by the influence of handicap over quality of life by social support. Thus, external factors can cause inconsistent interactions between components of the WHO model. Patient outcome may be improved if such factors are considered. (Aging Clin. Exp. Res. 13: 11-15, 2001) ©2001, Editrice Kurtis

INTRODUCTION

The WHO model of impairment, disability and handicap (1) has become the main conceptual framework for understanding the chronic consequences of stroke, and for managing the rehabilitation of stroke patients. This model assumes that there is a positive correlation between its components: the more impaired a patient is, the more disabled and more handicapped he will become.

Since its presentation in 1980, two important additions to this model have been proposed. First, a vertical extension of the model was suggested, using the concept of quality of life. Originally presented as an index of general health (2), it was later applied to clinical medicine and added to the WHO model, somewhere above the concept of handicap (Fig. 1). This concept incorporated physical, emotional and social aspects of the patient’s condition.

Secondly, lateral extensions to the WHO model were proposed (3), suggesting that certain factors that are exogenous to the model could moderate the influence that each of the model’s main components exerts on the following component (Fig. 1). These external factors could explain why despite an evident positive association between impairment, disability and handicap, it is not always proportional. For example, a relatively small impairment may cause a large disability, or a large disability may sometimes produce only a small handicap. These factors in themselves were divided into external, like social support, and internal like sense of control.

Social support has been defined as “the experience or information that one is loved and cared for, valued and esteemed, and able to count on others should the need arise” (4). It is believed to be effective as a buffer against stress only insofar as it is perceived, and indeed, the social support provided by the family to the rehabilitating patient has been shown to be an important prognostic factor (5, 6). Sense of control or perceived control has been defined as the subject’s belief in his ability to decide, control and influence his present and future condition (7). The purpose of this study was to investigate the influence of social support and sense of control on the components of the WHO model, as applied to stroke rehabilitation patients.
SUBJECTS AND METHODS

A sample of 100 individuals was generated over a 24-month period by random and retrospective selection from a larger study population of 400 participants in an inpatient stroke rehabilitation program (8). Inclusion criteria comprised premorbid independence in in-doors mobility and basic activities of daily living, returning home without need for 24-hour assistance, and living at home at the time of the follow-up visit. One hundred and thirty patients, who were eligible to participate in the study at the time of discharge from the rehabilitation program, did not participate for the following reasons: 37 patients (28%) died during the follow-up year; 31 patients (24%) were transferred to a nursing home; 9 (7%) patients were hospitalized in general hospitals during the follow-up visit; 31 patients (24%) moved and were not located; and 21 patients (16%) refused to participate.

The mean age of the sample population was 73±8 years, and 41% were females. Sixty-six percent of the participants lived with a spouse or other family member. Stroke was diagnosed by a neurologist according to WHO criteria (9), and localization was aided with computed tomography in 90% of patients. Fifty-two percent suffered a right hemispheric stroke, 38% a left hemispheric stroke, and 10% a vertebro-basillar stroke. The mean interval between stroke onset and the follow-up study was 15 months, and 13±2 months have passed between discharge from the rehabilitation program and the evaluation. Demographic and stroke-related characteristics of the patients who participated in the study and the patients who did not participate in the study were not significantly different.

The following measurement tools were used, and relationships between the various tested factors were determined by linear regression analysis of the scores obtained.

1. Post-stroke impairment was rated according to the scale suggested by Reding et al. (10), and revalidated in our stroke population (11). This scale distinguishes between patients suffering from pure motor deficit, somatosensory motor deficit and combined sensory motor deficit including visual field impairment.

2. Post-stroke disability was rated with the Functional Independence Measure (FIM). This is a functional (or disability) measure whose reliability, content validity and clinical significance were established (12), and its subscale summaries may be considered “quasi-intervals” (13). The FIM has also been tested for proxy-patient agreement, and found to be a reliable source of information from the caregivers on most issues (12).

3. Post-stroke handicap was rated with the London Handicap Scale (14). This is a recently developed interval handicap scale, and its construct validity and reliability have been tested on a group of stroke survivors one year after the stroke, similarly to our study population. It examines six dimensions in which a person is expected to fulfill a role: mobility; physical independence; occupation; social integration; orientation; and economic self-sufficiency.

4. Post-stroke quality of life was rated with the Life Satisfaction Index, version A (LSIa). This is not a disease-specific measure, but rather, a specialized measure of quality of life for the domain of elderly patients discharged from convalescence into the community (15). It contains factors representing zest for life, mood tone and congruence between desired and achieved goals. The LSIa is particularly appropriate for the elderly, and has good correlations with other life satisfaction scales and high internal reliability (2). It was chosen because it had been used in the past to measure life satisfaction in a healthy elderly population residing in the same metropolitan area as the participants in this study (16).

5. Social support was measured by the Tel-Aviv Social Support Instrument, which had been validated and tested on healthy controls by one of the authors (17).

6. Sense of control was assessed with the Perceived Stress Scale (18).

7. Education was categorized as basic (6 years), high school (12 years) or above (University or other similar degrees).

8. Socioeconomic condition was categorized as poor, adequate or good.

9. Depression was diagnosed according to DSM-4 criteria and treatment of patient with antidepressants, and was then noted as either present or absent.