International Classification of Functioning, Disability and Health (ICF) and correlation between disability and finance assets in chronic stroke patients

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Summary. *Background:* Stroke is the third cause of long term disability worldwide and its rehabilitation program must to have into account all aspects of disability. International research and politics increasingly study the relationship between disability and the direct costs associated with living with a disability. *Objective:* Using the ICF, this article provides a correlation between financial assets and disability in participation and activities, in a context such as the Italian one where there is a twenty-year decentralization of the national health system. *Methods:* At the University of Catanzaro, in southern Italy, n=130 ICF checklists of stroke patients were analyzed at 6 months from the end of the rehabilitation treatment. Financial assets domains in environment and nine domains in participation and activities were correlated, in order to evaluate the relationship between familiar economic condition and disability. *Results:* Pearson's r test (t=-6.6515, df=25, p-value<0.05) showed a significant correlation of 0.79. Multiple R-squared was 0.639 and an we reported an Adjusted R-squared of 0.6245 (p<0.05). Thus, about 62% of the increase of the all considered disability qualifiers in participation and activities in ICF checklist can be explained by a lower financial income. *Conclusions:* In a regional context (Calabria) of a European country (Italy) with a national health system, thanks to the ICF it can be assumed that with the decrease of the financial income, the gap in participation of activities increases. (www.actabiomedica.it)

Key words: ICF, disability, poverty

Introduction

Stroke is the third cause of long term disability worldwide and it's rehabilitation program must to have into account all aspects of disability. The health changes of cronic stroke patients have led to reevaluate functional and social aspects in the assessments as proposed by the World Health Organization in the International Classification of Functioning, Disability and Health (ICF) (1-4). It is an essential tool to identify and measure efficiency and effectiveness of rehabilitation, focusing on both physical structure, activities and participation by the whole person. The functional profile is drawn up through body functions and structures, activity and participation, with respect to the real living environment the evaluation of the function and structure of body systems is enriched and outlined by the participation of the patient in daily life activities (5).

Adequate functional profiling helps to identify a patient-tailored rehabilitation. In order to facilitate patients profiling, all is organized in domains. In the second part of ICF classification, the Performance qualifier assesses the participation restriction by describing the persons actual task or action in social context/environment. The domains in participation

and activities (P&A) can be defined by a 0-4 score (performance qualifier). From 0, No difficulty, means the person has no problem to 4, Complete difficulty, that means that a problem is present more than 95% of the time, with an intensity, which totally affects daily life. In the third part of ICF classification, the Environmental factors make up the physical, social and attitudinal environment in which people live and conduct their lives. These factors can be qualified as barrier or facilitator. from 0 No barrier/ facilitator to -4 Complete Barrier or +4 complete facilitators. Jones et al. reported that poor socioeconomic characteristics are associated with worse functioning (6) . Italy has a national health system similar to the British NHS. However, the universal coverage underwent a policy of regionalization, which increased the powers to the 20 Italian regions (7). Casanova reported that southern Italy is marked by greater difficulty for families to respond to disability than the North, with the incidence of family poverty shifted upwards. Furthermore, it is shown that the response of the national health system to disability is lower in southern Italy compared to the north (8). To sensitize the public opinion about this social aspect of rehabilitation process and eventual effects on the relationship between disability and social costs, we assessed disability on different level of financial assets in an university hospital in southern Italy, using the ICF domains in participation and activities (P&A) (9).

Methods

We analyzed stroke patients' ICF checklists from Physical Medicine and Rehabilitation Unit of the University Hospital in Catanzaro (Calabria, southern Italy). Data were collected from June 2015 to February 2019. To objectively quantify the impairment caused by a chronic stroke, National Institutes of Health Stroke Scale (NIHSS) score was used. The NIHSS is composed of 11 items, each of which scores a specific ability between a 0 (normal function) and 4 (loss of function). The minimum score is 0 and maximum possible score is 42 (10). In order to guarantee homogeneous data, the survey was conducted on a mild 4-16 NIHSS and mild 80-110 Functional Independ-

ence Measure (FIM) score. The FIM is an 18-item, 7-level scale developed to uniformly assess severity of patient disability and medical rehabilitation functional outcome (11). At discharge, we selected stroke patients (NIH=9.8±4.1) with similar and homogeneous age (50.1±15.5 y), FIM (91.2±9) and activity and participation. We analyzed n=130, six months' follow-up from hospital discharge, ICF checklists. Using the e1650 domain (financial assets), we divided the sample in 3 subgroups: e1650-4 (with no income) (n=55), e1650+1 (single income) (n=35) and e1650+4 (double income) (n=40). We analyzed the following domains: Recreation and leisure (d210), Undertaking multiple tasks (d220), Carrying out daily routine (d230), Moving objects (d430), Walking (d450), Looking after one's health (d570), Acquisition of necessities (d620), Interpersonal relationships (d760), Community life (d910). All analysis was conducted using R 3.6.1. All statistical tests were two-tailed and were regarded as significant at $p < 0.05$. Correlations between in P&A domains and Financial assets qualifier were examined using Pearson's correlation coefficient.

Results

The results demonstrated a significant influence between all domains in P&A and the amount of financial resources (Table 1).

Pearson's r test (t=-6.6515, df=25, p-value<0.05) showed a significant correlation of 0.79. A value of about 80% implies that a nearly linear equation describes the relationship between financial assets and participation. In other words, the two variables go hand in hand, in the sense that when the value of financial resources increases, the value of the P&A disability qualifiers decreases proportionately. So that the value of the dependent variable can be approximately derived from the value of the dependent variable. We evaluated the coefficient of determination (r2) as the variability of the dependent variable compared to the independent one. Multiple R-squared was 0.639 and an we reported an Adjusted R-squared of 0.6245 (p<0.05). Thus, about 62% of the increase of the all considered disability qualifiers can be explained by the different financial income.

Table 1. Legend: - 4 Complete barriers, +1 Mild facilitator, +4 Complete facilitator

Financial Assets		e1650-4	e1650+1	e1650+4
Recreation and leisure	d210	2,67±0.7	2,05±07	1,88±0.7
Undertaking multiple tasks	d220	2,97±0.8	2,05±06	1,98±0.8
Carrying out daily routine	d230	3,37±0.5	2,95±07	1,48±0.5
Moving objects	d430	2,27±0.7	2,08±08	1,86±0.8
Walking	d450	3,47±0.7	2,95±07	1,78±0.7
Looking after one's health	d570	3,87±0.7	2,65±07	1,57±0.5
Acquisition of necessities	d620	3,77+0.7	2,09+08	1,48+0.6
interpersonal relationships	d760	3,21±0.7	2,87±04	1,66±0.4
Community life	d910	2,91±0.7	1.95±07	1,36±0.4

Discussion

In order to clarify the correlation between disability and finance assets, we used the ICF checklist, an inexpensive and affordable tool, that consists of 125 second-level categories of the whole ICF classification system. It's a simple questionnaire, filled out by the physician and makes it possible to classify the most important ICF categories in clinical practice (12). The Italian National Health System (NHS), established in 1978, follows a Beveridge model developed by the British NHS. Like the British NHS, healthcare coverage is provided and financed by the government through taxes. Universal coverage provides uniform healthcare access to citizens. Nonetheless, in Italy the strong policy of decentralization, which has been taking place since the early 1990s, has gradually shifted competences from the state to the 20 Italian regions (13). In this context, the regions of southern Italy are characterized by poverty and disability rates higher than the national averages (8). The situation is reversed by analyzing the regions of central and northern Italy (8). The results indicate that the analysis of the ICF checklists domains shows that a lower income reflects a higher disability, but in particular about 62% of the increase of all disability qualifiers can be explained by the different financial income. Despite the analysis of only 130 ICF files, this study shows that in a region where the decentralization of the national health system leads to uneven assistance, ICF checklists show that 2/3 of stroke patients are less involved in partici-pation and activities because they have a lower economical income.

Conclusions

In a national health system, such as the Italian one, despite being regionalized, it becomes imperative to highlight the disability that is strictly related to different financial assets. To raise awareness of a fairer assistance policy, the ICF, after 20 years, is still a useful tool to analyze not only the individual but even more the environment in which it is immersed.

Conflict of interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article

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