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Modification in self-rated health in patients discharged by a geriatric rehabilitation ward

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ABSTRACT

Self-rated health is a valuable outcome in geriatric rehabilitation besides objective results. The present work aims at measuring and analyzing overall health as it is perceived at admission into and at discharge from a geriatric rehabilitation ward. Overall health was self-appraised through a visual-analogue scale (VAS), spanning from 0 (worst) to 10 (best). We studied 1997 patients (70% females), aged 79 (standard deviation, s.d. 8.7) years; most were frail, either functionally, clinically and cognitively. 80% of patients were discharged to home after a length of stay lasting 47.5 (s.d. 22.7) days. At admission, 3/5 patients appraised favorably their overall health (VAS ≥ 6/10): at discharge, the proportion rose to 3/4, with a mean (s.d.) gain = 2 (2) points. The improvement in self-perceived health score positively correlates with the grade expressing clients' overall satisfaction for the stay (*p* 0.001), and with discharge versus admission differences in: Barthel Index (BI) total score (*p* < 0.001), Tinetti total score, Mini Mental State Examination (MMSE), Geriatric Depression Scale (5 items GDS), pain (VAS 0 to 10). A Linear regression model predicting the changes in self-perceived health included changes in BI, MMSE, GDS, pain, dropping Tinetti test. Changes in self-rated health were positively correlated to functional gain adjusted for pre-morbid level, and to relative functional gain. By analysis of variance, health self-appraisal changed more favorably in patients discharged to home than for other social outcomes (all *p* < 0.001). As expected, trends in self-perceived health parallel improvements in objective functional gauges and subjective indicators.

Keywords: Cognition; Functional Gains; Geriatric Rehabilitation; Mood; Pain; Self-Rated Health

1. INTRODUCTION

Geriatric rehabilitation wards face the complexity of different clinically important goals. A wide array of health outcomes and situations must be addressed, that range from overcoming adverse clinical [1] or unexpected events [2] to managing comorbidity and frailty [3,4]. Moreover, we must prioritize subjective feelings besides, objective targets. Health-related quality of life is quoted as a reference outcome measure in clinical trials. Furthermore, it is best used in older persons to capture the global burden of multiple, simultaneous and interactive chronic conditions on physical, psychological and social function. Moreover, in diseases like stroke, Parkinson's disease or chronic coronary artery disease, the relationship between clinical measures of disease severity and health-related quality of life is nonlinear [5]. Also, in five common chronic diseases (arthritis, ischemic heart disease, chronic pulmonary disease, diabetes mellitus and cancer), physicians' ratings are generally worse and only weakly associated with the patients' ratings of quality of life. Patients' own perception of their health, as well as social and other factors adds to the multidimensional construct of quality of life in elderly outpatients [6]. Core issues of geriatric rehabilitation like ambulation difficulties and depression heavily impinge on perceived health and functioning in community living older bearing "geriatric syndromes" like sleep disturbances, falls and urinary incontinence [7]. Rehabilitation interventions which focused on restoring independence in basic activi-

ties of daily living most related to self-rated health (like taking stairs, ambulation and chair/bed transfer) could theoretically improve self-rated health [8]. Disease, observed function and self-perceived health status are separate but interrelated entities, wherein disease shows a stronger relationship to observed function than self-perceived health. Comprehensive assessment of frail elderly may have to take into account all these three areas, especially in very frail elders [9]. Hence, an individualized approach to outcome measurement is warranted in geriatric rehabilitation [10].

The present work aims at measuring and analyzing overall health as it is perceived at admission into and at discharge from a geriatric rehabilitation ward.

2. MATERIALS AND METHODS

2.1. Outcome and Explanatory Measures

Overall health was self-appraised through a visual-analogue scale (VAS), spanning from 0 (worst) to 10 (best). Both close to admission and to discharge, patients were asked to rate their overall health prompted by images like "☹" or "☺", at respective ends of a line (**Figure 1**). The same kind of appraisal applied to pain: score 0 meaning no pain, whilst score 10 pointing at top level pain. Functional state was assessed through the Barthel Index (BI) [11], balance and gait performances by Tinetti test [12-14], general cognition by the Mini Mental State Examination (MMSE) [15,16], mood (depressive symptoms) by 5 items Geriatric Depression Scale (GDS) [17, 18].

2.2. Setting

1997 patients (70% females) were studied, aging 20 to 100 years (age: mean = 79, standard deviation, s.d. = 8.7, median = 80, mode = 82). Our sample mostly includes typically frail elders, as shown by the prevalence at admission of a set of indicators: pressure ulcers (European Pressure Ulcer Advisory Panel stage $\geq 2^{nd}$) almost 2 out of 5, potential risk of malnutrition almost 4 out 5, food texture modification more than 1 out of 7, communication difficulties 2 out of 5, MMSE < 24/30 one half, depressive symptoms in almost 3 out of 5—with severe depressive symptoms (GDS ≥ 4/5) in 1 out 12, clinically relevant pain (VAS ≥ 6/10) about 2 out of 5. Patients were also functionally impaired at entry: BI (total score/100) = 55.4 (s.d. = 24.4), high falling risk (Tinetti test total score ≤ 18/24) in 9 out of 10 people.

2.3. Statistical Analysis

Descriptive and inferential analysis was carried out through the SPSS software. Either parametric or non-parametric tests were performed, as appropriate. Relative functional gain was calculated according to the Montebello Rehabilitation Factor Score [19].

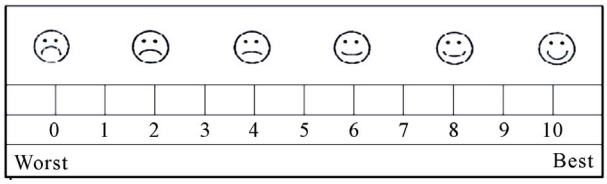

Figure 1. Prompted visual analogue scale.

3. RESULTS

After a length of stay lasting 47.5 (s.d. 22.7) days, 80% of patients were discharged to home, 8.5% to nursing homes, 4% to hospital, 7% to other rehabilitative settings (including day hospital); 0.5% of patients died. At admission, 3 out of 5 patients appraised favorably their overall health (VAS ≥ 6/10): at discharge, the proportion rose to 3 out of 4, with a mean (s.d.) gain = 2 (2) points. Mean (s.d.) self-rated was 5.7 (2.1) at admission, and 7.7 (1.8) at discharge ($p < 0.001$) (**Table 1**). The improvement in self-perceived health score positively correlates with the grade expressing clients' overall satisfaction for the stay (Spearman's rho = 0.11; p 0.001), and with discharge versus admission differences in: BI total score (Spearman's rho = 0.16; $p < 0.001$), Tinetti total score (Spearman's rho = 0.12; $p < 0.001$), MMSE (Spearman's rho = 0.24; $p < 0.001$), GDS (Spearman's rho = 0.14; $p < 0.001$), pain (Spearman's rho = 0.12; $p < 0.001$). A model was found that predicted the changes in self-perceived health ($R = 0.28$; $p < 0.001$). Linear regression selected as independent variables the discharge versus admission differences in the following variables: BI, MMSE, GDS, pain; differences for Tinetti test were dropped out. Discharge versus admission differences in pain score and GDS kept their statistically significant correlations with trends in self-appraised health after respective adjustment while performing partial correlations. No relationship was found between changes in self-appraised health and length of stay.

Changes in self-rated health was positively correlated to functional gain adjusted for pre-morbid level (Spearman's rho = 0.12; $p < 0.001$), and to relative functional gain (functional gain as a % of rehabilitative potential) (Spearman's rho = 0.14; $p < 0.001$). By analysis of variance, health self-appraisal changed more favorably in patients discharged to home than in those going across different social outcomes (nursing home, hospital, other rehabilitation settings) ($p < 0.001$) (**Table 2**).

4. DISCUSSION

The American Geriatrics Society and the American Academy of Physical Medicine and Rehabilitation joint-

Table 1. Self-rated health at admission and at discharge.

Admission		Discharge		p^a
mean	s.d.	mean	s.d.	
5.7	2.1	7.7	1.8	<0.001

[a]Same statistical significance by Wilcoxon test and by paired *t*-test.

Table 2. Difference in self-appraised health (discharge minus admission) according to social outcome.

Social outcome[b]	Difference in self-rated health[a]	
	mean	s.d.
Home	2.18	2.21
Day Hospital	1.74	1.63
Other rehabilitation	1.58	2.33
Nursing home	1.21	2.18
Hospital	−0.82	2.67

[a]Difference between discharge minus admission scores; [b]$p < 0.001$ by analysis of variance.

ly addressed in a statement of principles what matters while measuring key rehabilitation outcomes. Common principles and complementary approaches by geriatrics and physical medicine and rehabilitation concur to face 21st century demography caring older patients in surgical and medical specialties [20-23]. Significant differences in physical function and dependency in activities of daily living (ADL) were seen in relation also to wellbeing, in Nordic nursing home residents [24]. It is greatly challenging to find out whether individually tailored and enhanced activities can lead to decreased dependence and increased wellbeing, in nursing home settings [25]. As we expected, trends in self-perceived health parallel improvements in either cognitive performances, objective functional gauges or other subjective indicators (like pain or mood) [26-31]. More, statistical modeling supports the plausibility of our results. Subacute rehabilitation patients feel accurate expectations of their health-related quality of life at discharge [32].

Further, we previously showed that customer satisfaction is realistically related to reasonably attainable functional as well as clinical outcomes [33], consistently with the majority of the literature [34-37]. Other Authors stressed subjective evaluation of therapy over objective success on health-related quality of life after rehabilitation. Congruent positive (subjective and objective) and "satisfaction paradox" (incongruent positive subjective and negative objective ratings) hip fracture patients got the highest subjective gains in health-related quality of life. Unfortunate patients and "dissatisfaction dilemma" patients (incongruent subjective negative with objective positive ratings) estimated their gains as similarly low [38]. Another study reported the impact of the treatment and rehabilitation in hip-fracture patients by using structured self-assessment instruments of perceived health and related them to objective outcome assessments. The objective outcome seemed as informative as the subjective evaluations of patients' self-assessment [39].

We are aware of limitations in the present study. First, 13% of patients were unable to reliably self-rate their overall health. Second, the strength of correlations between modification in self-appraised health and other variables is low, albeit statistically significant. Third, the same limitation applies to the amount of variance accounted for by our model.

5. CONCLUSIONS

Traditional outcomes of geriatric rehabilitation include: 1) functional improvement, 2) clinical stabilization, 3) getting back home. Such aims can be pursued to somewhat different extents and at varying degrees of combinations [26]. Our data show we substantially achieved all these goals. Besides these objective results, subjective aspects are getting increasing relevance. Hence, we point, to a relevant issue, the patients' subjective improvement in self-appraisal of overall health. Our results in terms of objective and subjective rehabilitative outcomes are consistent with the literature supporting inpatient rehabilitation specifically designed for geriatric patients [40], as well as the role of context to influence health outcomes [41].

Then, whilst evaluating the treatment outcomes, "shouldn't we be asking patients if they are better?" [42].

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