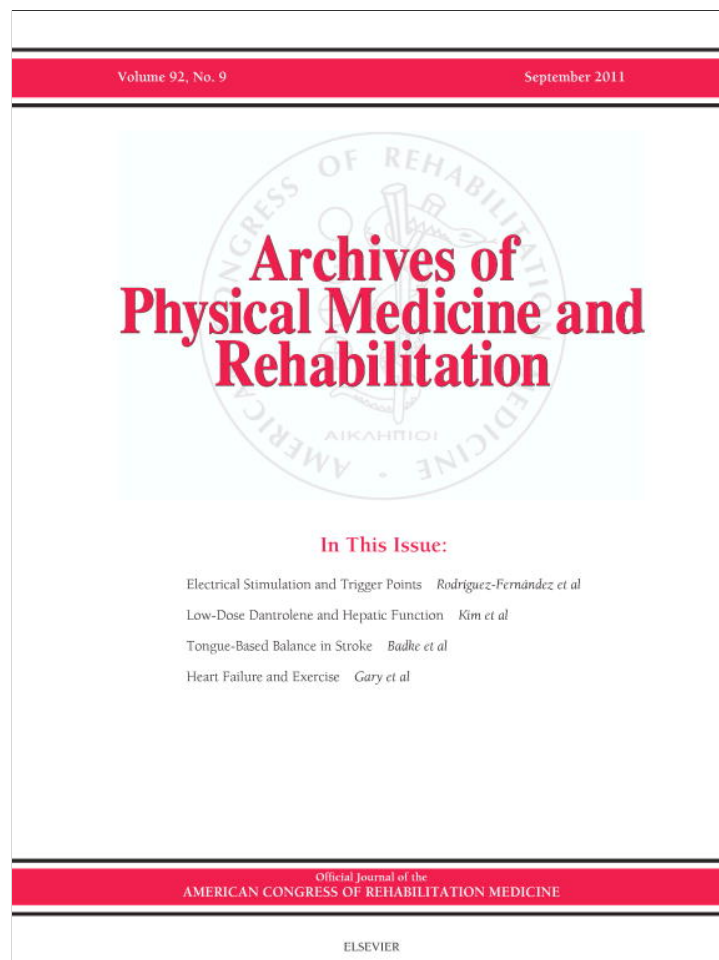




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Satisfaction With Activity and Participation and Its Relationships With Body Functions, Activities, or Environmental Factors in Stroke Patients

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ABSTRACT. Bouffoulx É, Arnould C, Thonnard JL. Satisfaction with activity and participation and its relationships with body functions, activities, or environmental factors in stroke patients. Arch Phys Med Rehabil 2011;92:1404-10.

Objectives: To report the body functions, activities, and participation of stroke patients, and to investigate the relationships over time with the patients' perceived satisfaction with their level of activity and participation.

Design: Descriptive.

Setting: Hospital, home.

Participants: Stroke patients (N=45; mean age $\pm$ SD, 69 $\pm$ 10.7y) assessed by the same examiner.

Interventions: Not applicable.

Main Outcome Measures: The Stroke Impairment Assessment Set was used to measure body functions, the Mini-Mental State Examination was used to measure cognitive level, and the Depression subscale of the Hospital Anxiety and Depression Scale was used to measure mood level. The ABILHAND and ABILOCO scales were used to measure activity, and the SATIS-Stroke questionnaire was used to measure satisfaction with activities and participation. Social and physical environmental factors were assessed by the World Health Organization *International Classification of Functioning, Disability and Health* Checklist Version 2.1a Clinician form. checklist. Patients were assessed during the acute (1wk), postacute (3mo), and chronic (6mo) phases after stroke onset.

Results: Significant changes were observed over time in stroke body functions, cognitive status, manual and locomotion abilities, and satisfaction with activity and participation. At 1 week, satisfaction with activity and participation was not related to any body functions, activities, or environmental factors. At 3 months, manual ability was the only variable that was significantly related to satisfaction. During the chronic phase, manual ability and body functions were the best predictors of the stroke patient's perceived satisfaction. However, this combination of factors predicted only 43% of the variation in the SATIS-Stroke measures.

Conclusions: Satisfaction with activity and participation cannot simply be inferred from body functions and activities, because it depends on complex interactions between functional, personal, and environmental factors.

Key Words: Patient participation; Personal satisfaction; Rehabilitation; Stroke.

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STROKE IS A PRINCIPAL cause of long-term disability in industrialized countries¹ and is the third most common cause of death.^{2,3} The impact of stroke on patients' functioning may be measured using the *International Classification of Functioning, Disability and Health* (ICF)⁴. The ICF adopts a patient-focused approach. Depending on the severity and location of the brain lesion(s), stroke may affect 3 separate, but related, functional dimensions: the body dimension (body functions and structures), the individual dimension (activity), and the social dimension (participation). Body functions are the physiologic or psychological functions of the different body systems, and body structures are the anatomic parts of the body. Activity is the patients' ability to execute tasks or actions. Participation is the patients' involvement in life situations and the fulfillment of expected social roles (eg, being a spouse, parent, workers, and friend), considering their age, sex, and the society and culture in which they live. Disregarding the individual and social dimensions during interventions may lead to inappropriate long-term rehabilitation, especially when patients return to their communities.⁵

Stroke recovery is largely recognized as a complex process,⁶ and the time since onset influences this recovery.⁷ During the first 6 months, patients are generally confronted with various environments, and each ICF dimension may change over time.

Several instruments have been developed to measure the activities and participation level of stroke patients. Such instruments assess a variety of parameters, including the degree of a patient's performance in activities and life situations, the degree of assistance required, and the experienced difficulty. Satisfaction perceived by stroke patients in their experience in activities and life situations, independent of their actual performance, is rarely considered. In a patient-focused approach, it is important to measure satisfaction. Indeed, well-being can be defined as an individual's satisfaction with his or her ability to do what he or she wants. A patient may experience satisfaction despite the need for assistance and/or in the presence of disabilities. For instance, a person may feel satisfaction when s/he has an opportunity to make a favorable choice according to his or her lifestyle. In a previous study,⁸ the SATIS-Stroke questionnaire was developed as a satisfaction measure of the activity and participation of stroke patients in their real-life

List of Abbreviations

ADLs	activities of daily living
ANOVA	analysis of variance
CVA	cerebrovascular disease
HADS	Hospital Anxiety and Depression Scale
ICF	<i>International Classification of Functioning, Disability and Health</i>
MMSE	Mini-Mental State Examination
SIAS	Stroke Impairment Assessment Set
WHO	World Health Organization

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No commercial party having a direct financial interest in the results of the research supporting this article has or will confer a benefit on the authors or on any organization with which the authors are associated.

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0003-9993/11/9209-0126\$36.00/0

doi:10.1016/j.apmr.2011.03.031

environments. The SATIS-Stroke scores have been transformed into unidimensional and linear satisfaction measures using the Rasch measurement model.⁹

According to the ICF, changes in 1 dimension (body functions, activities, participation, or environmental factors) have the potential to influence and modify one's perceived satisfaction, but not always in a predictable, unequivocal manner.¹⁰ Environmental and personal contextual factors can also facilitate or hinder patients' functioning at the body, individual, or social levels. Although several studies have investigated the relationships between impairments and activities,¹¹⁻¹³ none to our knowledge have examined the relationships between these dimensions and satisfaction or changes over time in relationships between satisfaction and the other ICF dimensions.

The objectives of this study were to report the body functions, activity, and environmental factors in stroke patients during the acute, postacute, and chronic phases and to investigate their relationships over time with patients' perceived satisfaction with their activity and participation.

METHODS

Participants

This study was approved by the Medical Ethics Committee of the Université catholique de Louvain, Belgium. Patients gave informed written consent before the evaluations. The participants were recruited from a sample of adult patients admitted to Belgian stroke units between March 2007 and September 2008, who had a primary diagnosis of stroke or cerebrovascular accident (CVA). Eligible stroke patients were identified by reviewing the unit's weekly admission records.

To be included in this study, the subjects had to present with a confirmed, eligible stroke as defined by the World Health Organization (WHO) as "rapid onset of vascular origin reflecting a focal disturbance of cerebral function, excluding isolated impairments of higher function and persisting longer than 24 hours."¹⁴ No other confirmatory information (ie, brain scans) was used to confirm the stroke diagnosis. Subjects were excluded if they: (1) had stroke onset more than 8 days prior to admission, (2) were unable to care for themselves prior to their stroke, (3) had a stroke due to a subarachnoid hemorrhage, (4) were not expected to survive for at least 6 months, or (5) were lethargic, obtunded, or comatose, or (6) were aphasic. Sixty-three patients were originally recruited. Between the acute and postacute phases, 11 patients chose to discontinue their participation and an additional 7 patients dropped out between the postacute and chronic phases. Hence, a total of 45 stroke patients (29 men and 16 women) with a mean age $\pm$ SD of 69 ± 10.7 years were assessed by the same examiner and included in the study. The sample description is provided in table 1.

Procedure

All 45 patients were followed from the onset of stroke until 6 months after stroke. Stroke survivors are typically described as going through the following phases: (1) acute phase (1wk after the CVA onset), (2) postacute phase (3mo after the CVA onset), and (3) chronic phase (6mo after the CVA onset). The patients received instructions on how to fill out the questionnaires and were tested individually in a quiet room. Patients who could not write were assisted with pictograms representing the responses' scale.

Instruments

The ICF model⁴ was used as a conceptual framework to assess the functioning of the stroke patients. The patient's

Table 1: Sample Description

Characteristics	Data
Sex (n)	
Men	29
Women	16
Age (y), mean (range)	69 (45–93)
CVA location (n)	
Right brain	26
Left brain	19
Residence (n)	
Home	34
Nursing home	11
Social status (n)	
Married	28
Unmarried	17

NOTE. n=45.

satisfaction with activity and participation, as well as other ICF dimensions, were assessed at each of the 3 aforementioned phases. Moreover, environmental factors were assessed after discharge at 3 and 6 months after stroke onset.

Assessment of body functions. Various aspects of stroke impairments were measured by the Stroke Impairment Assessment Set (SIAS) including motor function, tone, sensory function, range of motion, pain, trunk function, visuospatial function, and speech function. All 22 SIAS items were rated from 0 (severely impaired) to 3 (normal), except for the motor function items which were rated from 0 (severely impaired) to 5 (normal). SIAS total scores range from 0 (severely impaired) to 76 (normal) corresponding to the summation of the individual item scores.^{15,16}

Cognitive function was measured by the Mini-Mental State Examination (MMSE) instrument.¹⁷ The MMSE investigates an individual's orientation, attention, calculation, recall, language, and motor skills. The total MMSE score ranges from 0 (severe cognitive impairment) to 30 (normal).

Mood was measured by the Hospital Anxiety and Depression Scale (HADS).¹⁸ The HADS is a self-assessment scale developed to detect states of depression and anxiety. In this study, only the depressive subscale was used to verify the severity of mood disorders. A higher HADS score represents a more depressive status; scores over 11 usually indicate a mood disorder.

Activity assessment. Walking ability was measured with the 13-item ABILOCO questionnaire.¹⁹ This instrument was validated previously using a Rasch analysis¹⁹ in a sample of stroke patients and found to possess good psychometric qualities (validity, reliability, linearity, unidimensionality). This questionnaire measures "the walking ability of adult stroke patients by focusing on the activity domain of the ICF."¹⁹ The 13 locomotor items in the questionnaire were rated by stroke patients themselves on a 2-level scale (0: impossible; 1: possible).

Manual ability was measured with the 23-item ABILHAND questionnaire, which measures adults' "capacity to manage daily activity requiring the use of hands and upper limbs, whatever the strategies involved."¹¹ This instrument was validated previously by a Rasch analysis in a sample of stroke patients and found to possess good psychometric qualities (validity, reliability, linearity, unidimensionality). Twenty-three activities were rated by stroke patients themselves on a 3-level scale (0: impossible; 1: difficult; 2: easy).

Satisfaction assessment. Perceived satisfaction in the activity and participation dimension was measured using the

Table 2: Requirements for Human and Technical Aids During the Postacute and Chronic Phases

Environmental Factors	3mo (%)	6mo (%)	McNemar test (<i>P</i>)
Human aids			
Close family assistance	89	67	0.03*
Professional assistance	56	67	0.44
Friends assistance	11	11	1.00
Personal assistance	7	7	1.00
Technical aids			
Technical aids for walking	29	44	0.17
Technical aids for daily living activities	47	38	0.29
House adaptations	16	16	1.00
Technical aids for communication	9	9	1.00

**P* < .05.

36-item SATIS-Stroke questionnaire,⁸ which was validated previously by a Rasch analysis allowing changes over time to be objectively quantified on a linear scale. The patients were asked to report their perception on a 4-level scale (0: very dissatisfied; 1: dissatisfied; 2: satisfied; 3: very satisfied).

Environmental factors assessment. Environmental factors were assessed using the WHO's ICF checklist²⁰ and included the patients' social (human assistance) and physical environment (technical assistance). The 8 items shown in table 2 were selected. Four items were related to support and relationships, and 4 items were related to products and technology. For each item, the patients were asked to answer whether the human or technical aid was absent or present on a 2-level scale (0: absence; 1: presence).

Statistical Analysis

Descriptive statistics were used to determine the extent of the stroke patients' body functions, activity, satisfaction with activity and participation, and requirements for human or technical assistance in their usual environment. A Friedman 1-way repeated measure analysis of variance (ANOVA) by ranks was performed to detect changes in the stroke patients' body functions over time. Subsequently, multiple pair-wise comparisons were computed using a Tukey test. A 1-way repeated measures ANOVA was used to observe changes in the activity and participation of patients over time. Subsequently, multiple pair-wise comparisons were computed using the Holm-Sidak method. Changes in the requirements for human and technical

environmental aids were also investigated between the post-acute and chronic phases using the McNemar test. Human and technical environmental scores were computed for the presence of 4 human and 4 technical aids from the ICF checklist.

The strengths of the linear associations between the satisfaction measures and other ICF variables (SIAS, MMSE, HADS for body functions, and ABILOCO and ABILHAND for activity) were determined using Spearman or Pearson correlation coefficients, depending on the nature of the data. Spearman correlation coefficients were calculated to investigate the linear relationship between the perceived satisfaction measures and the environmental factors during the postacute and chronic phases. Correlation coefficients were interpreted according to the Guilford rules.²¹ Excluding the environmental factors, all of the ICF variables that were found to be significantly related to patients' satisfaction with their activity and participation were included in a multiple linear forward stepwise regression to select the best independent predictors of satisfaction. The adjusted coefficient of determination, which considers the number of selected variables, was used to avoid overestimating the true predictive capacity of the regression equation. The alpha level of significance was fixed at .05 for all the statistical tests.

RESULTS

The stroke patients' body functions, activity, and satisfaction with their activity and participation during the acute, postacute, and chronic phases are presented in table 3. Significant changes were observed over time in body functions, as measured by the SIAS ($\chi^2=10.01$, *P* = .007), and in cognitive status, as measured by the MMSE ($\chi^2=77.25$, *P* < .001). For both measures, significant improvements were observed between the acute and postacute phases, but not between the postacute and the chronic phases. Depressive status tended to increase over time as measured by the HADS; no significant change was observed between the acute and postacute phases, but a significant increase in depressive status was observed between the postacute and chronic phases.

Manual and locomotion abilities tended to increase over time (manual ability: *F* = 11.21, *P* < .001; locomotion ability: *F* = 10.49, *P* < .001). A significant improvement in manual and locomotion abilities was observed between the acute and postacute phases, but not between the postacute and chronic phases. During the postacute phase, patients were approximately 4 ($e^{1.42}$) to 5 ($e^{1.57}$) times more likely to succeed at performing a given manual or locomotor activity than during the acute phase. Meanwhile, during the chronic phase, stroke patients were 1 ($e^{0.19}$) to 1.5 ($e^{0.52}$) times more likely to succeed at

Table 3: Stroke Patients' Body Functioning, Activity, and Satisfaction With Activity and Participation During the Acute, Postacute, and Chronic Phases

Assessments	Periods of Evaluations			1wk vs 3mo		3mo vs 6mo	
	1wk	3mo	6mo	Statistics	<i>P</i>	Statistics	<i>P</i>
Human functioning							
Impairments							
SIAS, median (interquartile range)	38 (32–46)	44 (38–50)	46 (38–52)	q=3.58	<.05	q=0.48	>.05
MMSE, median (interquartile range)	21 (18–23)	23 (19–25)	24 (22–26)	q=6.41	<.05	q=5.51	>.05
HADS, median (interquartile range)	6 (5–8)	6 (4–11)	9 (5–12)	q=0.60	>.05	q=4.17	<.05
Activity and participation							
ABILHAND, mean $\pm$ SD logits	−2.463 $\pm$ 2.035	−0.892 $\pm$ 1.897	−0.707 $\pm$ 2.897	t=3.85	<.001	t=0.45	.65
ABILOCO, mean $\pm$ SD logits	−2.730 $\pm$ 2.260	−1.309 $\pm$ 1.889	−0.790 $\pm$ 2.219	t=3.24	<.001	t=1.18	.24
SATIS-Stroke, mean $\pm$ SD logits	−1.191 $\pm$ 1.435	−0.090 $\pm$ 1.222	0.424 $\pm$ 1.804	t=3.49	<.001	t=1.63	.11

Abbreviations: q, Tukey Test; t, Holm-Sidak test.

Table 4: Relationships Between Satisfaction With Activity and Participation and Body Functions and Activity

Assessments	1wk	3mo	6mo
Human functioning			
Body functions			
SIAS	$\rho=.24$	$\rho=.16$	$\rho=.66^*$
MMSE	$\rho=.11$	$\rho=.15$	$\rho=.36^*$
HADS	$\rho=.22$	$\rho=-.20$	$\rho=.10$
Activity			
ABILHAND	$r=.23$	$r=.34^*$	$r=.66^*$
ABILOCO	$r=.03$	$r=-.12$	$r=.41^*$

* $P<.05$.

performing a given manual or locomotor than during the post-acute phase.

Satisfaction with activity and participation tended to increase over time. Similar to the improvement in manual and locomotor abilities, there was a significant improvement in satisfaction with activity and participation between the acute and postacute phases, but not between the postacute and chronic phases. During the postacute phase, patients were 3 times ($e^{1.10}$) more likely to be satisfied with a given activity or life situation than during the acute phase. During the chronic phase, the patients were 1.5 ($e^{0.51}$) and 5 ($e^{5.03}$) times more likely to be satisfied by their activities and life situations than during the postacute and acute phases, respectively.

The proportions of stroke patients using human and technical aids are presented in table 2. During the postacute phase, approximately 90% of the patients needed family assistance, and more than half of these patients required assistance from a health professional. Approximately 10% of the stroke patients received assistance from friends, and less than 10% received personal assistance. During the chronic phase, the stroke patients required significantly less family assistance than during the postacute phase, but this assistance remained important for two-thirds of the patients. The patients were receiving more assistance from health professionals during the chronic phase than during the postacute phase, but the difference was not significant between the 2 phases. Similar to the postacute phase, the chronic stroke patients required less assistance from friends and personal assistants. During the postacute phase, half of the patients required technical aids for their daily living activities, and 30% required technical aids for walking. Of the patients, 16% or less required house adaptations and communication aids. During the chronic phase, the stroke patients required more walking aids but fewer daily living activity aids than during the postacute phase. However, there was no significant change in the requirement for technical aids between the 2 phases. Similar to the postacute phase, few chronic stroke patients required house adaptations or communication aids ($\leq 15\%$).

Table 4 presents the relationships between the patients' satisfaction with activity and participation and their body functions and activity over time. No significant relationship was observed 1 week after CVA onset. At 3 months, manual ability was the only variable that was significantly, though weakly, related to the patients' perceived satisfaction with their activity and participation.²¹ At 6 months, body functions (as measured by the SIAS) and manual and locomotor abilities were significantly and moderately related to satisfaction while cognitive status was significantly, though weakly, related to satisfaction. No significant relationship was found between mood status and satisfaction.

A multiple linear forward stepwise regression was not performed on the acute phase data, because there was no significant relationship between satisfaction and the other ICF variables. During the postacute phase, manual ability was found to account for only 12% of the variance observed in the SATIS-Stroke measures. During the chronic phase, manual ability was the strongest predictor of perceived satisfaction, and it accounted for 35% of the variance. Body functions, as measured by the SIAS, served as the second best independent predictor of perceived satisfaction and accounted for an additional 8% of the variance. The addition of other ICF variables did not substantially improve prediction of satisfaction ($<3\%$ improvement). The following regression equation was obtained by the forward stepwise method: perceived satisfaction = 0.33 (manual disability as measured by ABILHAND) + 0.07 (physical impairments as measured by the SIAS) - 2.66. Manual ability and stroke body functions combined predicted 43% of the variance in the SATIS-Stroke measures.

The combined influence of manual ability and the SIAS body functions on satisfaction measures during the chronic phase is summarized in figure 1. The patients with both a high manual ability (ABILHAND > -0.35 logits, using the mean ABILHAND measures as the cutoff) and a high level of body functions (SIAS > 46 , using the median SIAS scores as cutoff) had the highest perceived satisfaction with activity and participation (median = 1.77 logits; interquartile range, .93–2.93 logits). The 12 patients who had either low manual ability measures associated with a high level of body functions or high manual ability measures associated with a low level of body functions had a lower perceived satisfaction with their activity and participation (median = .24 logits; interquartile range, -.69 to 1.48 logits). Finally, the 16 stroke patients with both low manual ability measurements and low levels of body functions had the lowest perceived satisfaction measures (median = -.53 logits; interquartile range, -1.38 to -0.07 logits). The Kruskal-Wallis test confirmed that the combined influence of manual ability and body functions was significantly related to perceived satisfaction with activity and participation ($P<.001$).

During the postacute phase, no significant relationship was observed between the perceived satisfaction with activity and participation and the need for human ($\rho=.20$, $P=.20$) or technical aids ($\rho=-.07$; $P=.66$). During the chronic phase, a significant relationship was observed between perceived satisfaction and the need for human assistance ($\rho=.45$, $P=.02$), but not between perceived satisfaction and use of technical aids ($\rho=-.20$, $P=.19$).

DISCUSSION

In this study, we examined perceived satisfaction with activity and participation and its relationship with ICF dimensions in 45 stroke patients during the acute, postacute, and chronic phases after stroke. In most cases, no significant relationships were observed among physical impairment, activity limitations, and perceived satisfaction during the acute and postacute phases. In the chronic phase, manual ability and body functions were the best independent predictors of patients' perceived satisfaction with activity and participation; however, these factors only predicted 43% of the variance.

During the acute phase, no significant relationship was observed between perceived satisfaction with activity and participation and the different ICF dimensions. Indeed, in the acute phase, patients are critically ill and frequently bedridden with brief standing and ambulatory periods.²² During hospitalization, stroke patients are rarely confronted with activities of daily living (ADLs) and the variety of life situations that exist in their home and social environments. Hospital health profes-

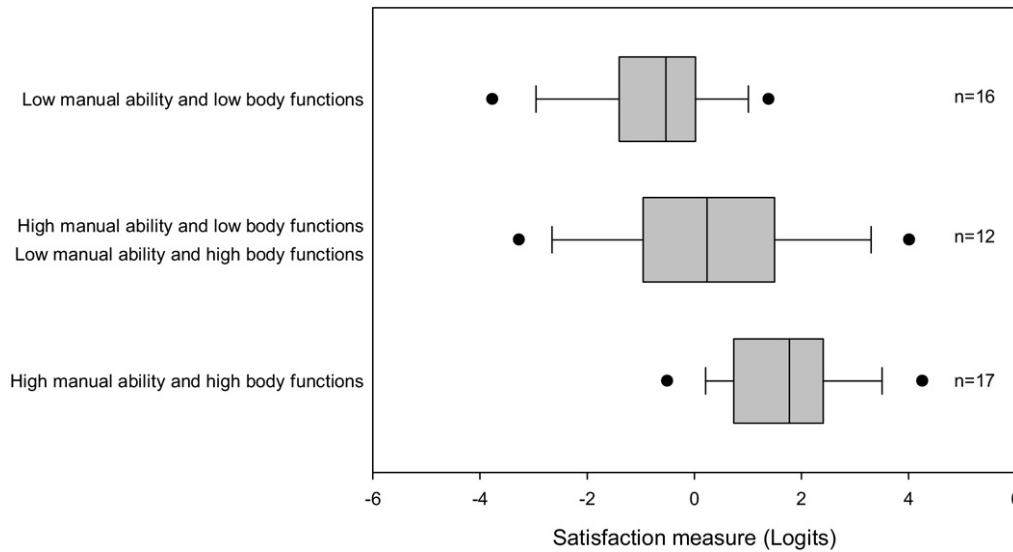


Fig 1. Box plots showing the distributions of stroke patients' perceived satisfaction with activity and participation measures according to the presence of high or low level manual ability and high or low level body functions. Solid dots indicate the 5% and 95% outliers; vertical bars outside the box indicate the 10% and 90% limits; box indicates the 25% and 75% limits (ie, the interquartile range); and the vertical line inside the box indicates the median of the distribution.

sionals aim to help patients recover losses of body functions and meet their basic needs such as washing themselves. This situation is not necessarily satisfying for patients. The perceived satisfaction with the activity and participation measured in the stroke unit probably results from the patients' perceived difference between their actual and previous health conditions. This difference is probably explained by the absence of any relationships among the body functions, the individual ICF dimensions, and the patients' perceived satisfaction with activity and participation.

At 3 months, all of the ICF variables, except mood status,²³ were enhanced, indicating that the patients' health statuses improved along with increases in their perceived satisfaction. In most cases, there were no significant relationships observed between the patients' perceived satisfaction and the other ICF dimensions. Only manual ability was significantly related to perceived satisfaction, but this relationship was weak. Hospital discharge is a critical stage in the rehabilitation of stroke patients.²⁴ Frequently, patients encounter difficulties in transferring the skills they learned in the hospital to their home environments.²⁵⁻²⁷ Indeed, at home, patients will be confronted with increasing challenges in achieving their ADLs. During the postacute phase, 89% of the patients received close family assistance to achieve their daily activities, and 60% of the patients benefited from the assistance of health professionals. In addition to the patients requiring human aids, 50% of the patients used technical aids for ADLs. It is well-known from the literature that achieving independence in ADLs requires good upper-limb functioning.²⁸ Achieving ADLs without help requires more effort and time from the patients even though the patients have a reduced energy capacity. This observation may explain why patients with high manual ability are more likely to be satisfied in their activities and life situations than those with low manual ability. Manual ability accounts for 12% of the variance observed in the SATIS-Stroke measures, highlighting the importance of having good manual ability in achieving satisfaction with their performance in ADLs.

During the chronic phase, the patients' functioning did not improve significantly relative to the postacute phase. Only depressive status increased significantly, a finding which is consistent with prior findings in the literature.²⁹⁻³³ Contrary to the postacute phase, perceived satisfaction with activity and participation during the chronic phase seems to reflect the

combined effect of the ICF dimensions. Indeed, satisfaction correlated moderately with body functions and correlated weakly with cognitive functional level. Significant moderate relationships were also observed between perceived satisfaction and manual and locomotion abilities. Moreover, a significant moderate relationship was found between patients' perceived satisfaction and the use of human aids. The environmental analysis showed that in the chronic phase, family assistance decreased in favor of assistance from health professionals, but this change was not significant relative to the postacute phase. This observation suggests that if family assistance remains important, health professionals must ensure that the activities prescribed are embedded in everyday routines, such that they are meaningful for the patients.

During the chronic phase, manual ability, which accounted for 35% of the variance, was the factor with the strongest association with perceived satisfaction. It seems that perceived satisfaction with activity and participation is more closely associated with upper-limb functioning than lower-limb functioning. Body functions, as measured by the SIAS, only accounted for an additional 8% of the variance. This finding reinforces the fact that satisfaction during the chronic phase results from the interactions of many components. Although the combination of manual ability and stroke body functions was significantly related to satisfaction, it only predicted 43% of the variance in SATIS-Stroke measures, consistent with the literature.^{34,35} This finding seems to reflect the expected course of recovery (except for anterior cerebral artery stroke) wherein upper extremities are more affected initially and show more variability in recovery during follow-up.^{36,37} As suggested by the ICF, several contextual factors, including personal factors (eg, cognitive status, motivation, and adaptability) and environmental factors (eg, health services, financial support, and patients' habits) may facilitate or hinder perceived satisfaction.

In our study, a moderate significant relationship was observed between satisfaction and the use of human aids. Several authors reported that social support was among the most robust and consistent predictors of poststroke activities.³⁸ Therapists should identify the contextual factors that can be changed to facilitate ADLs. However, it is important to note that some contextual factors are difficult to modify (eg, societal attitudes, patients' incomes, and community facilities).³⁹ Thus, when planning a rehabilitation intervention, it is necessary to address

the contextual factors that are easily modifiable and have the greatest potential to improve patients' satisfaction.³⁹ In the future, it would be interesting to investigate the relationships between satisfaction with activity and participation and contextual factors more precisely than in the present study by using a valid measure, such as the Measure of the Quality of the Environment.⁴⁰

Study Limitations

The present study was limited by its cross-sectional nature and the fact that causality could not be determined using correlation coefficients or multiple linear regression analysis. As a result, we cannot state that 43% of the variance observed in the satisfaction measures results directly from manual ability and body functions. Prospective studies would therefore be useful in determining how changes in manual ability and body functions influence patients' satisfaction. Another limitation of the present study lies in the fact that it cannot be generalized to patients with major cognitive impairments because such patients were excluded from the study cohort. The potential ceiling effects of the MMSE should also be mentioned here. Moreover, the exclusion of aphasic patients could have resulted in an underestimation of the proportion of stroke patients who could benefit from communication aids. In the future, it would be useful to investigate social participation in terms of the level of accomplishment.

CONCLUSIONS

Stroke patients' satisfaction with activity and participation cannot simply be inferred from body functions and activities, because it depends on complex interactions between functional, personal, and environmental factors. Our results stress the importance of considering and measuring patient satisfaction, because it is not simply the integration of body functions and activities.

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