Neurología 40 (2025) 229—238

NEUROLOGÍA

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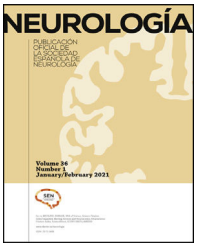

ORIGINAL ARTICLE

Quality of life and mental health in young strokes

D. Alonso Modino[a,b,*], L. Perestelo Pérez[c], F.M. Rosa González[b], A. Toledo Chavarri[c], C. Valcarcel Nazco[c], F.I. Montón Álvarez[a,b]

[a] *Hospital Universitario Nuestra Señora de Candelaria, San Cristóbal de La Laguna, Tenerife, Spain*
[b] *Facultad de Ciencias de la Salud, Universidad de La Laguna, San Cristóbal de La Laguna, Santa Cruz de Tenerife, Spain*
[c] *Servicio de evaluación del Servicio Canario de la salud, El Chorrillo, El Rosario, Tenerife, Spain*

Received 14 May 2022; accepted 1 November 2022
Available online 19 March 2025

KEYWORDS
Young stroke;
Quality of life;
Mental health;
EuroQol;
SF-36;
GHQ12;
Hamilton Anxiety;
Hamilton Depression;
BURQOL-meter

Abstract
Introduction: Stroke has a significant impact on mental health and health-related quality of life (HRQoL); these aspects have not been sufficiently studied in young stroke.
Objectives: To evaluate HRQoL, mental health, and the relationship between these variables and the incorporation of young adults into working life after stroke.
Material and methods: We conducted a prospective descriptive study of patients with JS between 2016 and 2017, using such questionnaires and scales as EuroQol-5D, the 36-item Short Form Health Survey, National Institutes of Health Stroke Scale (NIHSS), modified Rankin Scale (mRS), 12-item General Health Questionnaire, Hamilton Anxiety and Depression Rating Scales, and BURQOL-meter; tests were administered at 2 interviews, held 6 and 12 months after stroke.
Results: We analysed 41 patients, with a mean age of 41.8 years. At one year, the mean NIHSS score was 0.54 and mRS score was 0—2 in 95.1%. No differences were observed over time in quality of life or mental health scales. Prevalence rates for depression and anxiety at one year were 46.3% and 41.5%, respectively. Male sex and active employment were associated with better HRQoL. A total of 41.5% of patients were in work at one year after the stroke. Statistically significant associations were observed between quality of life, mental health, and incorporation into working life.
Conclusions: Young stroke affects HRQoL, and patients are at high risk of anxiety and depression, underdiagnosed and undertreated disorders that affect quality of life and the return to work, which decreases after stroke in young adults.

DOI of refers to article: https://doi.org/10.1016/j.nrl.2022.11.006.
* Corresponding author.
E-mail address: deborah@alonsomodino.com (D. Alonso Modino).

https://doi.org/10.1016/j.nrleng.2025.03.003

PALABRAS CLAVE
Ictus juvenil;
Calidad de vida;
Salud mental;
EuroQol;
SF-36;
GHQ12;
Hamilton Ansiedad;
Hamilton Depresión;
BURQOL-meter

Calidad de vida y salud mental en el ictus juvenil

Resumen
Introducción: El ictus provoca un importante impacto sobre la salud mental y la calidad de vida relacionada con la salud (CVRS); aspectos no suficientemente estudiados para el ictus juvenil (IJ).
Objetivos: Evaluar la CVRS, la salud mental y la relación entre éstas y la incorporación a la actividad laboral tras un IJ.
Material y métodos: Estudio descriptivo prospectivo de pacientes con IJ entre 2016—2017. Se emplearon los cuestionarios y escalas EuroQol-5D, SF-36, NIHSS, Rankin-m, GHQ12, Hamilton Ansiedad, Hamilton Depresión y BURQOL-meter, realizados en dos entrevistas, a los 6 y 12 meses tras el IJ.
Resultados: Fueron analizados 41 pacientes, 41.8 años de media. Tras un año la media de NIHSS fue 0.54 y el Rankin 0—2, 95.1%. No hubo diferencias en las escalas de calidad de vida y salud mental en el tiempo. La tasa de depresión y ansiedad al año fue de 46.3% y 41.5% respectivamente. Los hombres y trabajadores tienen mejor CVRS. El 41.5% de los pacientes trabajaban tras un año del IJ. La calidad de vida, salud mental y la incorporación a la vida laboral tienen relación estadísticamente significativa entre sí.
Conclusiones: El IJ altera la CVRS y los pacientes tienen alto riesgo sufrir ansiedad y depresión, patologías infradiagnosticadas e infratratadas, las cuales condicionan la calidad de vida, así como la incorporación a la vida laboral, que se ve mermada tras el IJ.

Introduction

Young stroke (YS) is defined as cerebrovascular disease in patients younger than 55 years.[1,2]

The incidence of YS has increased in recent years, probably as a result of the increase in the use of toxic substances, the prevalence of vascular risk factors, environmental pollution, and lifestyle changes.[3,4] The incidence of YS in Europe is approximately 8 cases/100 000 population, with a slightly lower rate among women.[5]

Stroke is a frequent cause of disability; in the specific case of YS, the greater survival rate is associated with an increased risk of neuropsychiatric comorbidities. The aim of this study is to examine health-related quality of life (HRQOL) among patients with YS, as well as the incidence of anxiety and depression in this population and their relationship with these patients' employment status.

Material and methods

We conducted a prospective, descriptive study of patients aged 18—50 years who were admitted to a tertiary-level hospital for acute stroke treatment between 2016 and 2017. We excluded patients who: *1)* presented language disorders preventing their participation in any stage of the study and who did not have a proxy (a friend or relative who could respond on the patient's behalf); *2)* were resident in a foreign country; *3)* could not be located; and *4)* did not agree to participate in the study. Patients with language disorders that improved in the assessment at 12 months did participate in the study.

The study was conducted in 3 stages: collection of data related to the care provided for stroke; and 2 in-person or telephone interviews, at 6 and 12 months after stroke.

During these interviews, we administered different questionnaires assessing HRQOL (EuroQoL-5D and the 36-item Short-Form Health Survey [SF-36]) and mental health (Hamilton Depression and Anxiety Rating Scales [HAM-D and HAM-A, respectively] and the 12-item General Health Questionnaire [GHQ-12]), and an adapted version of the Social Economic Burden and Health-Related Quality of Life in patients with Rare Diseases in Europe instrument (BURQOL-RD), which collected information on patients' employment status. We also recorded National Institutes of Health Stroke Scale (NIHSS) and modified Rankin Scale (mRS) scores.[6] Where necessary, scores were recoded according to the user manuals for each instrument.[6—11] For HAM-A and HAM-D scores, cut-off points were used to establish the presence and severity of anxiety and depression[6,8,12,13]: *HAM-A*: 0—7 points: no or minimal anxiety; 8—14 points: mild anxiety; 15—23 points: moderate anxiety; $\geq$ 24 points: severe anxiety[14]; *HAM-D*: 0—6 points: no depression; 7—17 points: mild depression; 18—24 points: moderate depression; 25—52 points: severe depression.[6,8,13]

Statistical analysis was performed using the SPSS® statistics software. We performed a descriptive analysis of frequencies, analysed dependencies with the chi-square test, compared scale scores using the Wilcoxon signed-rank test and comparison of means, studied correlations using the Spearman rho statistic, and compared factors using the Mann-Whitney *U* test and the Kruskal-Wallis test. The reliability of the scales was analysed with the Cronbach alpha

Table 1 Sociodemographic characteristics of our sample.

Sociodemographic characteristics	Value
Age	41.8 years
Men	58.5%
Married	39%
Secondary education	43.9%
Employed in services sector	63.5%
Active employment before stroke	65.9%
Resident in towns with > 100 001 pop.	41.5%

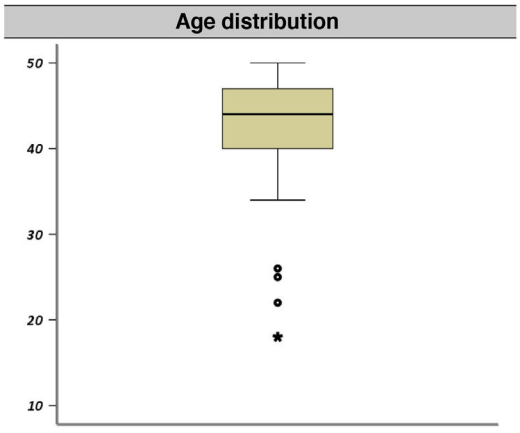

Figure 1 Age distribution of the sample. Distribution of patients according to their age at stroke occurrence.

statistic, with a lower bound of 70%. The threshold for statistical significance was set at $P < .05$ (95% confidence interval).

Results

A total of 107 patients with YS were admitted to the hospital, accounting for 11.7% of all strokes ($n = 894$). Twenty-six percent were excluded, and 34.4% did not agree to participate, despite an improvement in participation with increased use of telephone interviews. We interviewed a total of 41 patients: 40 at 6 months and 41 at 12 months (the difference is due to improvement in a language disorder in one patient). Surveys were completed by patients in 97.5% of cases; in one case, a proxy completed the survey due to severe aphasia in the patient.

Mean age (standard deviation [SD]) was 41.8 (7.41) years; most patients were men (58.5%). The main sociodemographic characteristics are presented in Table 1; Fig. 1 shows participants' age distribution.

Regarding patients' personal history (Table 2), the most frequent vascular risk factors were smoking (39%), dyslipidaemia (29.3%), and arterial hypertension (26.8%). Some 19.5% reported use of some illegal drug.

Stroke was ischaemic in 82% of cases, with 9.7% being transient ischaemic attacks; the most frequent type of stroke was partial anterior circulation infarct (36.7%), with stroke of undetermined cause being the most frequent aetiology (47%). Among haemorrhagic strokes, subarachnoid haemorrhage and lobular intraparenchymal haemorrhage were the most frequent types (42.8% each; Table 3).

Table 2 Personal history.

Personal history	*n* (%)
Smoking	16 (39%)
Use of	
Alcohol	3 (7.3%)
Drugs	8 (19.5%)
Cocaine	2 (4.9%)
Cannabis	6 (14.6%)
Heart disease	9 (22%)
Atrial fibrillation	3 (7.3%)
Arterial hypertension	11 (26.8%)
Diabetes mellitus	3 (7.3%)
Dyslipidaemia	12 (29.3%)
Migraine	11 (26.8%)
Anxiety or depression	7 (17.1%)
Stroke	3 (7.3%)
Previous treatments	
Antiplatelets	7 (17.1%)
Anticoagulants	2 (4.9%)
Antidepressants	4 (9.8%)
Oral contraception[a]	5 (26.3%)

[a] Percentage of the total number of female patients ($n = 19$).

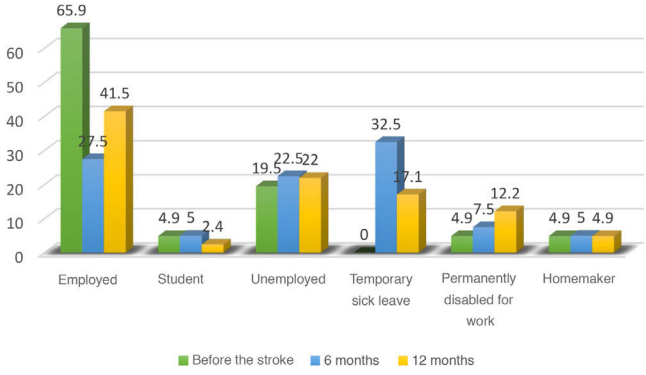

Figure 2 Employment status. Percentage of patients in each situation prior to and 6 and 12 months after stroke.

Employment status

Prior to stroke, 65.9% of patients were in active employment; after stroke, this percentage decreased to 27.5% at 6 months and 41.5% at 12 months (Fig. 2). At one year after stroke, an increase was observed in the percentage of patients on temporary or permanent sick leave (17.1% and 12.2%, respectively).

Among patients who were in employment prior to YS, the mean (SD) duration of sick leave at one year was 191.85 (143.608) days.

Disability and functional status

NIHSS

Mean NIHSS score decreased over time, from 4.2 at admission to 0.54 at one year ($P < .001$) (Fig. 3).

Table 3 Overview of stroke characteristics.

	Category	*n* (%)
Type of stroke	Ischaemic	34 (82.9%)
	Haemorrhagic	7 (17.1%)
	Total	41 (100%)
OCSP classification	TACI	5 (16.7%)
	PACI	11 (36.7%)
	LACI	4 (13.3%)
	POCI	10 (33.3%)
	Total	30 (100%)
Laterality	Left	15 (36.6%)
	Right	15 (36.6%)
	Posterior	11 (26.8%)
	Total	41 (100%)
Lausanne Stroke Registry classification	Atherosclerosis with stenosis	1 (3%)
	Atherosclerosis without stenosis	6 (17.6%)
	Other aetiologies	7 (20.6%)
	Undetermined aetiology	16 (47%)
	Emboligenic heart disease	4 (11.8%)
Comorbidities	Heart disease (PFO, endocarditis, fibroelastoma)	14 (34.1%)
	Artery dissection	3 (7.3%)
	Other (meningoencephalitis with vasculitis, toxic substances, venous infarction, carotid web)	4 (9.7%)
	Total	21 (51.1%)
Type of haemorrhagic stroke	SAH	3 (42.8%)
	Lobular intraparenchymal	3 (42.8%)
	Deep intraparenchymal	1 (14.3%)
	Total	7 (100%)
Aetiology of haemorrhagic stroke	Aneurysm	2 (28.6%)
	AVM	2 (28.6%)
	Arterial hypertension	3 (42.8%)
	Total	7 (100%)
Hospitalisation time	< 15 days	27 (65.9%)
	15—30 days	10 (24.4%)
	> 30 days	4 (9.8%)
	Total	41 (100%)

AVM: arteriovenous malformation; LACI: lacunar infarction; OCSP: Oxfordshire Community Stroke Project; PACI: partial anterior circulation infarction; PFO: patent foramen ovale; POCI: posterior circulation infarction; SAH: subarachnoid haemorrhage; TACI: total anterior circulation infarction.

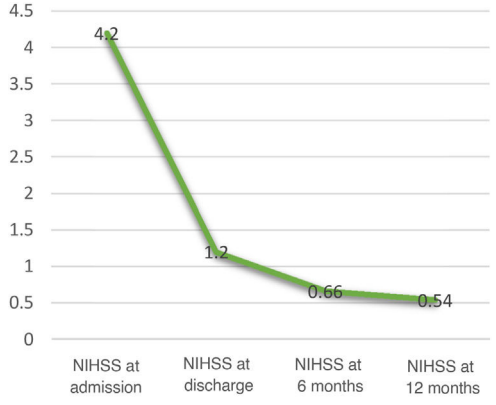

Figure 3 Progression in mean NIHSS score. Mean NIHSS scores at admission, at discharge, and at 6 and 12 months after stroke. Standard deviation for NIHSS at admission: 5.68; at discharge: 1.99; at 6 months: 1.527; and at 12 months: 1.343.
NIHSS: National Institutes of Health Stroke Scale.

Modified Rankin Scale

Following stroke, mRS scores of 0 were recorded in 50% and in 51.2% of patients at 6 and 12 months, respectively. The great majority of patients were functionally independent (mRS scores of 0—2) at 6 and 12 months (95% and 95.1%, respectively) (Fig. 4).

Quality of life scales

In these scales, higher scores indicate better quality of life.

EuroQol-5D

Mean (SD) EuroQoL-5D scores at 6 and 12 months were 0.67 (0.231) and 0.666 (0.237), respectively; this difference was not significant ($P = .872$). Mean score on the visual analogue scale was 62.48 (23.108) at 6 months and 62.39 (26.561) at 12 months.

The dimensions with the lowest scores were pain/discomfort and anxiety/depression. No difference was observed over time for this scale. Perceived health

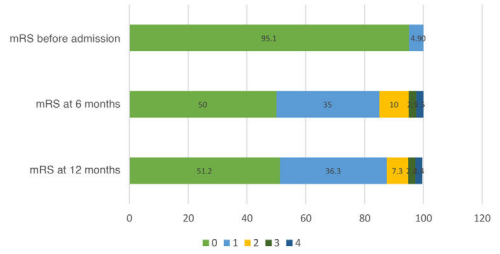

Figure 4 Modified Rankin Scale scores. Percentage of patients for each modified Rankin Scale score at discharge and at 6 and 12 months after stroke.
mRS: modified Rankin Scale.

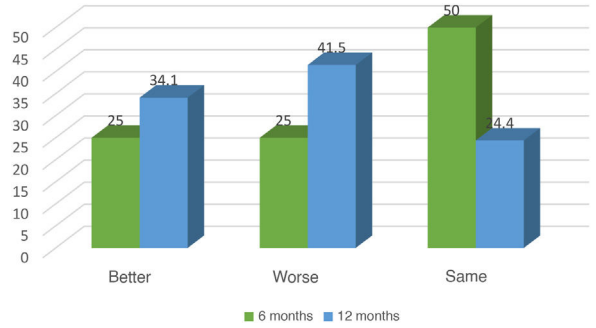

Figure 5 General health status according to the EuroQol-5D. Percentage of patients giving each response for the EuroQoL-5D item ''general health status'' at 6 and 12 months after young stroke.

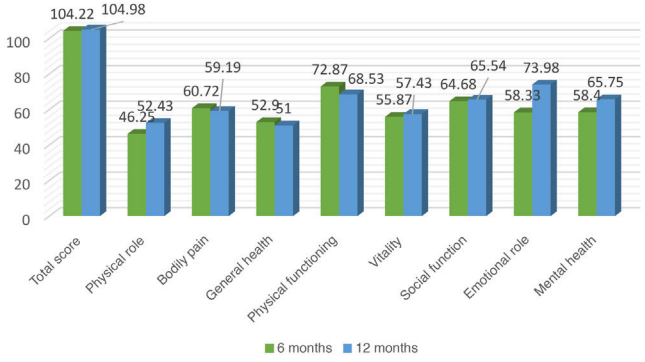

Figure 6 Mean SF-36 role scores. Mean scores for different roles on the SF-36 at 6 and 12 months after young stroke.
SF-36: 36-item Short Form Health Survey.

status compared with the last 12 months, at the time of the interviews, showed no statistically significant association with time. As shown in Fig. 5, 50% of patients reported poorer health status at 6 months, compared to 24.4% of patients at 12 months (P = .073).

The EuroQol-5D presented a Cronbach alpha value of 0.743.

SF-36 questionnaire

The mean total score (SD) was 104.22 (22.72) at 6 months and 104.98 (21.91) at 12 months; therefore, quality of life did not change over time.

The dimension showing the poorest scores was physical role, followed by general health and vitality (Fig. 6). Some dimensions showed worsening at one year, such as general health, bodily pain, and physical functioning, although these differences were not statistically significant.

The dimension that improved the most at one year after YS was emotional role, with significant differences between scores at 6 and 12 months (P = .009); mental health also showed a significant improvement (P = .004).

The mean physical component scores at 6 and 12 months were 43.51 (9.909) and 41.08 (11.9), respectively; this difference was not significant. However, the mental component did show an improvement (40.32 [12.092] vs 45.87 [12.44]; P = .002).

At 6 months, patients with YS most frequently felt that their health was somewhat worse than a year earlier (32.5%); however, after 12 months, 29.3% considered their health to be somewhat better than a year earlier; this improvement in self-perceived health was statistically significant (P = .004).

The mean score for each role is below that reported for the reference population.[12] Only 2 roles (mental health and social role functioning) showed better quality of life in some age groups than in the reference population.

The SF-36 presented a Cronbach alpha value of 0.550. However, the results are consistent with those of other scales.

Mental health scales

Higher scores indicate poorer mental health in all 3 of the scales used.

Hamilton Depression Rating Scale

Mean (SD) HAM-D scores at 6 and 12 months were 9.3 (9.016) and 8.71 (7.16), respectively; this difference was not significant (P = .599).

According to results from this scale, 50% of patients at 6 months and 53.7% at 12 months did not have depression. However, 35% and 34.1%, respectively, presented mild depression. The percentage of patients with severe depression decreased from 13% at 6 months to 7% at 12 months.

The HAM-D presented a Cronbach alpha value of 0.844.

Hamilton Anxiety Rating Scale

Mean total HAM-A score was 11 (12.064) at 6 months and 9.61 (9.932) at 12 months, with scores of 6.23 (6.1) and 5.8 (4.981), respectively, for somatic anxiety and 4.78 (6.31) and 3.8 (5.492), respectively, for psychic anxiety. No change was detected over time for the total score (P = .369) or for either subscale (P = .774 and P = .108).

Approximately 50% to 60% of patients did not present anxiety (Table 4). At 6 months, 19.5% of patients had severe anxiety.

The most frequent symptoms were intellectual symptoms, observed in 62.5% of patients at 6 months and in 75.6% at 12 months. The most severe symptoms were intellectual symptoms and depressed mood.

The HAM-A presented a Cronbach alpha value of 0.923.

General Health Questionnaire

The mean GHQ-12 score was 4.53 (4.309) at 6 months and 3.29 (3.823) at 12

Table 4 Hamilton Anxiety Rating Scale.

HAM-A score	6 months *n* (%)	12 months *n* (%)
No or minimal anxiety	22 (55%)	24 (58.5%)
Mild anxiety	5 (12.5%)	7 (17.1%)
Moderate anxiety	5 (12.5%)	6 (14.6%)
Severe anxiety	9 (19.5%)	4 (9.8%)
Total	40 (100%)	41 (100%)

HAM-A: Hamilton Anxiety Rating Scale.

months; this difference was not significant (P = .058).

Scores on this scale indicated some psychiatric disorder on the anxiety/depression spectrum in 50% of patients at 6 months and 46.3% at 12 months. The item with the worst scores was the sensation of being unable to overcome difficulties, which 34.1% of patients reported feeling ''rather more than usual.''

GHQ-12 scores were consistent with HAM-A and HAM-D scores, showing that nearly half of the sample presented anxiety or depression.

The GHQ-12 presented a Cronbach alpha value of 0.922.

Comparison between scales

The analysis of correlation between quality of life and mental health scales identified statistically significant associations in all cases. Quality of life scale scores (EuroQol-5D and SF-36) were positively correlated, with higher scores in one scale being associated with higher scores on the other. The same was true for mental health scales.

Quality of life scores were negatively correlated with mental health scores, with better quality of life (higher scores) being associated with better mental health (lower scores).

Analysis of the relationship with neurological function and disability (Table 5) revealed an inverse correlation between the EuroQol-5D and SF-36 scales, on the one hand, and the NIHSS and mRS, on the other. This suggests that poorer physical status is associated with poorer quality of life. Prior mRS score in these patients did not influence quality of life after YS.

HAM-D score was not correlated with NIHSS or mRS scores (P = .55). However, as occurred with the GHQ-12, we did observe a positive correlation between HAM-A and mRS at one year, indicating that greater disability is associated with poorer mental health.

EuroQol-5D scores were significantly associated with patient age, revealing better quality of life among younger patients.

Comparison between factors

Table 6 presents statistically significant associations identified in the comparison between the factors studied and quality of life and mental health scales.

Men presented better quality of life in terms of physical function role. Patients undergoing fibrinolysis/mechanical thrombectomy had poorer quality of life. Similarly, patients undergoing craniectomy scored lower on the EuroQol-5D scale and visual analogue scale. Unexpectedly, patients with history of heart disease prior to YS had greater vitality (SF-36). Absence of dyslipidaemia was associated with higher quality of life scores (SF-36).

Patients taking oral anticoagulants had poorer physical function (SF-36). Patients receiving oral contraceptives scored higher for self-perceived health (visual analogue scale) and lower on the GHQ-12, indicating better mental health.

Patients' employment status had an impact on quality of life and mental health: patients without work-related problems at 6 months and those who were working and studying presented better quality of life scores than those with permanent disability for work or who had not been on sick leave. Unexpectedly, patients who reported work performance issues scored better for physical function (SF-36) at 6 months and on the EuroQol-5D at 12 months after YS, suggesting that the performance issue was not physical. We also observed better quality of life among patients who had not requested or received a certificate of disability than in those who did have these certificates, with better scores in all scales.

As we might expect, both quality of life and mental health were poorer among patients who were not in active employment or were permanently disabled for work, compared to patients who were in active employment or education. Psychic anxiety was greater among patients with certificates of disability than in those who had not requested or received these certificates; patients who had work-related problems at 12 months after stroke had more anxiety (HAM-A), particularly psychic anxiety.

Regarding the aetiological classification of stroke, patients with stroke of undetermined cause had better quality of life than those with cardioembolic stroke or atherothrombotic stroke without stenosis.

Discussion

YS is a significant health problem, affecting patients' mental health and quality of life. Analysis of scale scores a year after stroke revealed no difference in quality of life or mental health, although we did observe changes in self-perceived health and an improvement in the mental component of the SF-36. The dimensions of quality of life presenting the poorest scores were anxiety, depression, pain, physical role, and general health.

Quality of life and mental health in these patients were related, and neither aspect should be overlooked. A patient's physical functioning and disability will influence their quality of life and mental health; therefore, it is crucial that sequelae be as mild as possible, and that they are treated early.

Multiple factors may influence quality of life. Men more frequently present YS (58.5%), and have better quality of life; quality of life is also better among younger patients. Presence of vascular risk factors was not excessive; the most frequent was smoking (39%), and 19.5% reported using some illegal drug. The risk factors for YS also include migraine with aura[2]; migraine (with or without aura) was more fre-

Table 5 Correlations between quality of life, mental health, functional status, and disability scales.

		NIHSS at admission	NIHSS at discharge	NIHSS at 6 months	NIHSS at 12 months	Previous mRS	mRS at 6 months	mRS at 12 months
EuroQol-5D	CC	*−0.344*	−0.304	*−0.308*	−0.305	−0.226	*−0.556*	*−0.537*
	P	*.028*	.053	*.050*	.052	.156	*< .001*	*< .001*
SF-36	CC	*−0.325*	*−0.362*	*−0.366*	*−0.373*	0.029	*−0.444*	*−0.502*
	P	*.028*	*.020*	*.019*	*.016*	.859	*.004*	*.001*
HAM-D	CC	0.177	0.056	0.80	0.095	0.096	0.199	0.303
	P	.269	.730	.617	.555	.550	.218	.055
HAM-A	CC	0.099	0.025	0.121	0.140	0.053	0.225	*0.308*
	P	.539	.876	.453	.383	.743	.160	*.050*
GHQ-12	CC	0.103	0.001	0.064	0.077	−0.049	0.196	*0.341*
	P	.522	.994	.689	.634	.760	.225	*.029*

CC: correlation coefficient; GHQ-12: 12-item General Health Questionnaire; HAM-A: Hamilton Anxiety Rating Scale; HAM-D: Hamilton Depression Rating Scale; mRS: modified Rankin Scale; NIHSS: National Institutes of Health Stroke Scale; SF-36: 36-item Short-Form Health Survey.
Statistically significant associations are shown in italics ($P < .05$).

quent in our sample than in the general population (26.8% vs 15%).[15] Quality of life after YS is affected by certain vascular risk factors; specifically, we observed poorer quality of life among patients with dyslipidaemia. Surprisingly, patients with history of heart disease scored best for vitality in quality of life scales.

Oral contraceptives increase the risk of stroke.[5] Among female patients, 26.3% were receiving this treatment; these patients had better self-perceived health and better mental health scale scores.

The most frequent type of stroke was ischaemic stroke (82%), with undetermined causes being the most frequent aetiology (47%), with a slightly higher rate than that reported in the literature (39.7%).[16] Interestingly, patients with stroke of undetermined aetiology had better quality of life.

Few patients received treatment in the acute phase (17.1%). However, those who did receive this treatment presented poorer quality of life; furthermore, an association between physical function and quality of life was observed

Table 6 Associations between factors and quality of life and mental health scales.

Factor	Scale	*P*
Sex[a]	SF-36 physical functioning	.048
Sick leave duration	EuroQol-5D	.030
	SF-36	.003
	SF-36 physical functioning	.003
	SF-36 physical role	.041
	SF-36 vitality	.029
	SF-36 social functioning	.010
	SF-36 physical component	.027
Certificate of disability	EuroQol-5D	.019
	SF-36	.003
	SF-36 physical functioning	.031
	SF-36 physical role	< .001
	SF-36 general health	.024
	SF-36 social functioning	.002
	SF-36 mental health	.034
	HAM-A psychic anxiety	.036
	SF-36 physical component	.012
Lausanne Stroke Registry classification	EuroQol-5D	.026
	VAS	.006
	SF-36	.025
Neurosonology (SAT and TC ultrasound)	EuroQol-5D	.050
	HAM-A somatic anxiety	.045
Fibrinolysis[a]	SF-36 mental component	.019
Thrombectomy[a]	SF-36 social functioning	.025
	SF-36 emotional role	.001
	SF-36 physical component	.039

Table 6 (*Continued*)

Factor	Scale	*P*
Craniectomy[a]	EuroQol-5D	.045
	VAS	.041
	SF-36 physical component	.039
Marital status	EuroQol-5D	.027
Employment status at 6 months	EuroQol-5D	.034
	SF-36	.003
	HAM-D	.028
	HAM-A	.013
	SF-36 physical role	.024
	SF-36 bodily pain	.011
	SF-36 general health	.008
	SF-36 vitality	.020
	SF-36 social functioning	.020
	SF-36 mental health	.046
	HAM-A somatic anxiety	.018
	HAM-A psychic anxiety	.048
	SF-36 physical component	.003
Employment status at 12 months year	SF-36	.009
	HAM-D depression	.028
	HAM-A anxiety	.023
	SF-36 physical role	.005
	SF-36 general health	.009
	SF-36 social functioning	.003
	HAM-A somatic anxiety	.027
	SF-36 physical component	.022
Employment status before stroke	HAM-A	.041
	SF-36 general health	.044
	SF-36 physical component	.025
Cocaine use	SF-36 bodily pain	.038
Heart disease[a]	SF-36 vitality	.030
Dyslipidaemia[a]	EuroQol-5D	.016
	VAS	.005
	SF-36	.025
	SF-36 physical functioning	.021
	SF-36 physical role	.047
	SF-36 bodily pain	.005
	SF-36 physical component	.001
Prior anticoagulation treatment[a]	SF-36 physical functioning	.033
	SF-36 physical component	.029
Prior contraceptive treatment[a]	VAS	.016
	GHQ-12	.030
Have you had any work-related problems due to your stroke? 6 months[a]	VAS	.048
Have you had any work-related problems due to your stroke? 12 months[a]	VAS	.022
	SF-36	.017
	HAM-A	.041
	SF-36 social functioning	.041
	SF-36 emotional role	.046
	HAM-A psychic anxiety	.034
''I do not work fewer hours, but I do have performance issues'' at 6 months[a]	Physical functioning	.029
	SF-36 physical component	.047
''I do not work fewer hours, but I do have performance issues'' at 12 months[a]	EuroQol-5D	.028
	SF-36 bodily pain	.011

GHQ-12: 12-item General Health Questionnaire; HAM-A: Hamilton Anxiety Rating Scale; HAM-D: Hamilton Depression Rating Scale; SAT: supra-aortic trunks; SF-36: 36-item Short-Form Health Survey; TC: transcranial; VAS: visual analogue scale.

[a] Mann-Whitney *U* test.

in these patients, probably due to their poorer physical function, with higher NIHSS scores. Craniectomy, as we might expect, was also associated with poorer quality of life.

Regarding anxiety and depression, 17.1% of patients had history of these disorders prior to stroke; however, at one year, practically half had anxiety or depression. This is a higher rate than those observed in other studies (30%).[17] In this case, relevant findings were the increased incidence compared to the values that might be expected, and the lack of treatment, possibly due to underdiagnosis. At one year after stroke, only 22% of patients were taking antidepressants; only 13% had consulted a psychologist and 2.4% a psychiatrist. Compared to stroke in older patients, YS presents better survival rates and prognosis, but a greater risk of neuropsychiatric disorders.[2,18] Therefore, we must be proactive in the detection and treatment of these disorders, taking into account the impact of mental health on these patients' quality of life. The increased prevalence of anxiety and depression may be related to the low percentage of patients receiving treatment.

The functional status of these patients after discharge is good, with a mean NIHSS score of 0.54 at one year after discharge. This is further supported by the fact that 95% of patients presented mRS scores of 0—2 at one year after YS. The fact that these patients are functionally independent but present poorer quality of life and mental health outcomes indicates that the alterations to their quality of life are not purely due to physical reasons.

The return to work is also altered after YS; this is closely related to quality of life, and is highly significant in the light of the young age of these patients. At 6 months after YS, only 27.5% of patients were working, with this percentage rising to 41.5% at 12 months, a similar rate to that reported by other authors (23%—40%).[1,2,19] Those studies established predictive parameters for the return to work, with the majority of factors preventing the return to work being physical. However, as mentioned above, these patients present excellent physical function; therefore, it is essential to analyse the cause of the problem. Employment status has an impact on patients' quality of life and mental health, as demonstrated by the poorer quality of life among patients who had to stop working. Similarly, patients with prolonged sick leave or work-related problems presented greater levels of anxiety and depression.

Current healthcare approaches aim to evaluate and quantify physical sequelae, with less emphasis placed on the patient's sense of well-being and relationship with their environment. Currently, the objective form of classifying these patients is based on scales that are not specific to YS, measuring physical sequelae and disability. As demonstrated by our results, enabling the patient to adapt to the return to work and social life is equally as important as minimising physical sequelae after the acute stage of stroke. Quality of life is rarely assessed at routine consultations, despite its impact on the return to work and on mental health.

Our results suggest that quality of life among patients with YS is not only physical, but also psychic and executive. The same level of emphasis should be placed on all dimensions of HRQOL. It should be noted that these patients are of working age, and all the alterations described may prevent them from continuing their professional and personal development.

Our findings suggest a need to modify healthcare approaches to these patients, with special emphasis placed on the assessment and treatment of non-physical sequelae.

Conclusions

Patients with YS present poorer HRQOL and high risk of developing anxiety and depression. The situation does not improve over the course of a year, with few changes in quality of life or mental health, possibly due to the underdiagnosis and undertreatment of these disorders. Quality of life parameters in these patients are poorer than in the general population. Patients with YS present more problems than those reflected by disability scale scores, and their reincorporation into working life is essential to their quality of life and mental health.

Funding

This study has received no specific funding from any public, commercial, or non-profit organisation.

Declaration of competing interest

The authors have no conflicts of interest to declare.

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