

## Patient with stroke: hospital discharge planning, functionality and quality of life

*Doente com acidente vascular cerebral: planeamento de alta, funcionalidade e qualidade de vida*  
*Paciente con accidente cerebrovascular: planificación del alta, funcionalidad y calidad de vida*

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### ABSTRACT

Stroke still causes high levels of human inability and suffering, and it is one of the main causes of death in developed countries, including Portugal. **Objective:** analyze the strategies of hospital discharge planning for these patients, increasing the knowledge related to hospital-home transition, discharge planning processes and the main impact on the quality of life and functionality. **Method:** integrative literature review using the PICOD criteria, with database research. **Results:** 19 articles were obtained, using several approaches and contexts. For quality of life, the factors related to the patient satisfaction with care and the psychoemotional aspects linked with functionality are the most significant. **Conclusion:** during the hospitalization period, a careful hospital discharge planning and comprehensive care to patients and caregivers – in particular the functional and psychoemotional aspects – tend to have an impact on the quality of life of patients. **Descriptors:** Stroke; Quality of Life; Patient Discharge; Rehabilitation; Nursing.

### RESUMO

O acidente vascular cerebral ainda origina elevados níveis de incapacidade e sofrimento humano, sendo das primeiras causas de morte nos países desenvolvidos, incluindo em Portugal. **Objetivo:** analisar as estratégias adotadas no planeamento da alta destes doentes, aprofundando o conhecimento inerente à transição hospital-domicílio, aos processos de preparação de alta assim como às principais repercussões na qualidade de vida e funcionalidade. **Método:** revisão integrativa de literatura, pelos critérios orientadores PICOD, com pesquisa em base de dados. **Resultados:** obtidos 19 artigos, com diversas abordagens e contextos. Para a qualidade de vida importa a satisfação com os cuidados recebidos e a consideração dos aspetos psico-emocionais, ligados à funcionalidade. **Conclusão:** no tempo de internamento, o planeamento cuidado da alta, o cuidado abrangente a doentes e cuidadores – nomeadamente aspectos funcionais e psico-emocionais – tendem a ter impacto na qualidade de vida dos doentes. **Descritores:** Acidente Vascular Cerebral; Qualidade de Vida; Alta do Paciente; Reabilitação; Enfermagem.

### RESUMEN

El accidente cerebrovascular todavía lleva a elevados niveles de incapacidad y sufrimiento humano, y es una de las primeras causas de muerte en los países desarrollados, incluido Portugal. **Objetivo:** analizar las estrategias adoptadas en la planificación del alta de estos pacientes profundizando en el conocimiento inherente a la transición del hospital al domicilio, a los procesos de preparación del alta, así como a las principales repercusiones en la calidad de vida y la funcionalidad. **Método:** revisión integradora de la literatura por los criterios orientadores PICOD con una búsqueda en bases de datos. **Resultados:** se obtuvieron 19 artículos con diversos enfoques y contextos. Para la calidad de vida importa la satisfacción con los cuidados recibidos y la consideración de los aspectos psicoemocionales ligados a la funcionalidad. **Conclusión:** en el tiempo de internamiento, la planificación cuidada del alta, el cuidado integral a los pacientes y cuidadores –en particular los aspectos funcionales y psicoemocionales– tienden a tener un impacto en la calidad de vida de los pacientes. **Descriptor:** Accidente Cerebrovascular; Calidad de Vida; Alta del Paciente; Rehabilitación; Enfermería.

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## INTRODUCTION

An increase in the average life expectancy of the population worldwide has been followed by an increased incidence of chronic diseases, reaching statistical dimensions that force specific actions by health professionals, in particular nurses. To understand this, it is important to learn the issues of hospital discharge planning and their impact on the functionality and quality of life (QoL) of patients, contributing to better care.

In the sphere of an ongoing study on ischemic stroke – also called cerebrovascular accident (CVA) – and converging concepts such as of functionality, QoL, length of hospital stay and hospital discharge processes/post-hospital referral (among others), we wanted to frame what the literature has presented and emphasized in recent years in this field into a methodologically organized and focused study. Aware of its social impacts on mortality<sup>(1)</sup> and morbidity indicators, levels of inability and suffering typically caused by stroke, the negative impact on the quality of life of patients and their families<sup>(2)</sup>, and the difficult control of several risk factors<sup>(3-4)</sup>, we have conducted an integrative literature review to clarify the study question: “Are the impacts on QoL and functionality of patients after a stroke related to length of stay and hospital discharge planning?”.

The resulting studies were analyzed to provide a response to the concerns above, based on the study title and question. The study conducted observed the framework of the Meleis’ Theory of Transitions<sup>(5)</sup> and considered a nonlinear view of the complex processes addressed by Morin<sup>(6)</sup>.

The general objective of this study was to increase the knowledge on the theme, particularly by means of analyzing the concerns related to the hospital-home transition, focused on the hospital discharge and the clarification of impacts on QoL, functionality and cognitive-emotional aspects of patients.

## METHOD

Regarding the methodology, several study strategies or approaches (arrangements of key words) were used in the integrative literature review. In the beginning of the fourth quarter of 2014, we analyzed the scientific literature published in the search engine EBSCO, checking the main databases (MEDLINE with Full Text, CINAHL Plus with Full Text, MedicLatina and Psychology and Behavioral Sciences Collection), and we selected the studies that generally respected some inclusion criteria, although without an inflexible limitation or condition that could result from an elaborated strategy; however, following a consensual methodology that could fulfill the needs of participants and be used in the interventions, comparisons, results and design of the studies [PICOD]. The criteria are presented in Chart 1, not considering the lines of comparisons [C].

The exclusion criteria considered were studies not conducted in the period defined for each approach, studies that did not address impacts or analysis vectors requested, studies that did not address the specific scope of the underlying pathology, studies that did not have their full text available or that had not been written in Portuguese, English or Spanish.

Exceptions were admitted, as indicated in Chart 2.

**Chart 1** – Criteria for inclusion of studies in the integrative review

PI[C]OD	Description
Participants	Patients, services and care processes, caregivers of patients with CVA (acute brain injury and consequences).
Interventions	Approaches and dimensions like functionality, quality of life, depressive symptoms, hospitalization processes and length of stay, hospital discharge and discharge planning, caregivers, rehabilitation and its mechanisms.
Results of the investigation	Evidence and relationships among the variables, regarding the strategies implemented and presented as the results or outcomes.
Design of the study	It did not constitute an inclusion/exclusion criterion.

Note: PI[C]OD = Participants, Intervention, [Comparisons], Results, Design; CVA = cerebrovascular accident.

**Chart 2** – Strategies (S<sub>1</sub> to S<sub>7</sub>) used in the search for studies, regarding the key words used, the study fields specified, the period defined, options of text availability, number of resulting articles and final number of articles (selected)

S	Key words	Fields specified	Period	Full text?	RES	RES/ Final
S <sub>1</sub>	stroke/quality of life/discharge planning	Abst/Abst/---	2000-2014	Yes	12	<b>10</b>
S <sub>2</sub>	length of stay/stroke/quality of life	Abst/Abst/Abst	2012-2014	Yes	13	<b>7</b>
S <sub>3</sub>	after stroke/quality of life/length of stay	Abst/Abst/Abst	2012-2014	Yes	05	<b>0</b>
S <sub>4</sub>	stroke/quality of life/length of stay/functionality	Abst/Abst/Abst/---	2012-2014	Yes + No	0+0	<b>0</b>
S <sub>5</sub>	stroke patients/quality of life/functionality	Abst/Abst/Abst	2012-2014	Yes + No	0+1	<b>1</b>
S <sub>6</sub>	stroke/length of stay/functionality	Abst/Abst/Abst	2012-2014	Yes	0	<b>0</b>
S <sub>7</sub>	stroke/discharge planning/functionality	Abst/Abst/Abst or ---	2012-2014	Yes + No	0+0	<b>0</b>

Note: S – strategy; Abst – abstract; Txt – text; RES – result in number of articles.

For example, in the first study strategy (S<sub>1</sub>) we used the key words “stroke”, “quality of life” and “discharge planning”, with the Boolean operator “and” (searched in the “abstract”, or without a field definition), and we obtained 12 articles (with a link for full texts) but in a period of 14 years (2000-2014). Of these 12 articles, 10 were retained, after excluding repeated articles and studies addressing aspects that were not of our interest. Only one article, of 2013, was obtained when we defined the period of 2012-2014 and kept the remaining criteria. A similar reading was conducted with the other strategies (S<sub>2</sub> a S<sub>7</sub>).

This methodology, summarized and explained above, resulted in the selection of 18 articles, to which we added another one – a commented article – totaling 19 articles, as illustrated in Figure 1 below. We highlighted the different nature of the studies compiled in terms of type, objectives, and methods, making it difficult to perform the comparison processes and eventual meta-analysis, which was not intended here. The search terms were *stroke*, *quality of life*, *discharge planning*, *length of stay*,

and *functionality*, in a cross-sectional analysis of Chart 1.

Chart 3 presents the studies selected for this integrative literature review, classified by numerical order, title, publication year and country, method and context where it was conducted and participants involved. The logic of the numerical order is related to the sequence of study strategies adopted.

These studies were analyzed according to the concerns mentioned in the introduction of this study, based on the essential and most relevant aspects of each study.

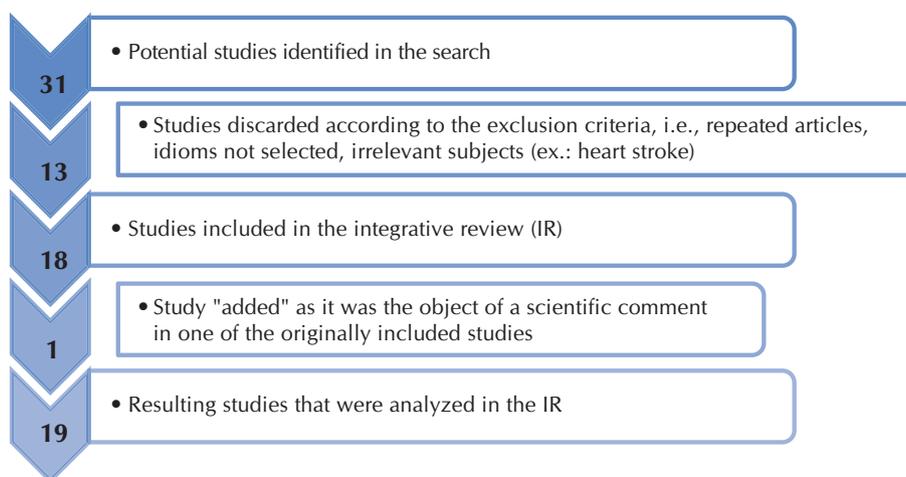


Figure 1 – Diagram illustrating the study selection process for the integrative review

Chart 3 – Distribution of selected articles according to their title, publication year/country, method and context/participants

Nº	Title	Year/country	Design/method	Context and participants
E <sub>1</sub> <sup>(7)</sup>	A clinical trial of an individualised intervention programme for family caregivers of older stroke victims in Taiwan.	2010; Taiwan	Randomized study	Hospital and homes of patients; elderly patients with CVA (n = 158; EG = 72; CG = 86) and their family caregivers.
E <sub>2</sub> <sup>(8)</sup>	A Randomized Trial Testing the Superiority of a Postdischarge Care Management Model for Stroke Survivors.	2009; United States	Randomized study	Hospital/specialized centers and community; 380 patients (n = 380; EG = 190; CG = 190).
E <sub>3</sub> <sup>(9)</sup>	Discharged after stroke - important factors for health-related quality of life.	2010; Sweden	Cross-sectional study	Home interviews with patients or in nursing homes; 188 patients (n = 188), consecutively included.
E <sub>4</sub> <sup>(10)</sup>	Early discharge plus home based rehabilitation reduced length of initial hospital stay but did not improve health-related quality of life in patients with acute stroke.	2000; United Kingdom	Comment and analysis of scientific articles	Comment and analysis of 2 scientific articles: Article 1 and Article 2 (S5).
E <sub>5</sub> <sup>(11)</sup> [E <sub>4.1</sub> ]	Home or hospital for stroke rehabilitation? Results of a randomized controlled trial. I: health outcomes at 6 months	2000; Australia	Randomized study	Hospital/home of patients/rehabilitation units; 398 patients with stroke were evaluated. The study involved 86 patients (n = 86; EG = 42; CG = 44).
E <sub>6</sub> <sup>(12)</sup>	Effectiveness of a postdischarge care management model for stroke and transient ischemic attack: a randomized trial.	2002; United States	Randomized study	Home of patients; 96 patients with CVA/TIA* were included. In the final analysis, 93 patients (n = 93) were distributed in two groups (EG = 47; CG = 46).
E <sub>7</sub> <sup>(13)</sup>	Family conferences in stroke rehabilitation: a literature review.	2013; Australia	Literature review	(n.a./ n.a.); 23 articles were obtained, 14 of which with level of evidence between I and III-3, addressing with merit the problems presented in this field.

To be continued

Chart 3 (concluded)

Nº	Title	Year/ country	Design/method	Context and participants
E <sub>8</sub> <sup>(14)</sup>	Long-term effects of the intensification of the transition between inpatient neurological rehabilitation and home care of stroke patients.	2006; Germany	Controlled study	Hospital; telephone contact and interview, for 3 years (community/homes). The study involved 71 patients (n = 71; EG = 36; CG = 35).
E <sub>9</sub> <sup>(15)</sup>	Randomized controlled trial of integrated (managed) care pathway for stroke rehabilitation.	2000; United Kingdom	Randomized prospective study	Hospital and community; the study involved 152 patients (n = 152; EG = 76; CG = 76).
E <sub>10</sub> <sup>(16)</sup>	The trajectory of minor stroke recovery for men and their female spousal caregivers: literature review.	2007; Canada	Narrative literature review	(n.a./ n.a.); 34 articles were found and included.
E <sub>11</sub> <sup>(17)</sup>	Training informal caregivers of patients with stroke improved patient and caregiver quality of life and reduced costs.	2004; United Kingdom	Comment and analysis of scientific articles	Comment and analysis of one scientific article: (Enot selected).
E <sub>12</sub> <sup>(18)</sup>	Community-applied research of a traditional Chinese medicine rehabilitation scheme on Broca's aphasia after stroke: study protocol for a randomized controlled trial.	2014; China	Multi-center, randomized study, with blind evaluation	Hospital and community health centers; the study involved 290 patients (n = 290; EG = 145; CG = 145).
E <sub>13</sub> <sup>(19)</sup>	Cost avoidance associated with optimal stroke care in Canada.	2012; Canada	Literature review / "Evidence from the literature"	(n.a./ n.a.)
E <sub>14</sub> <sup>(20)</sup>	Fabry's disease: A prospective multicenter cohort study in young adults with cryptogenic stroke.	2012; Canada	Multi-center, prospective cohort study [study protocol]	Hospital and follow-up; all patients* with stroke, aged 18 to 55 years, will be included in the study. (*At facilities enrolled as participating centers and working within the broad guidance of the Canadian Best Practice for Stroke Care).
E <sub>15</sub> <sup>(21)</sup>	First-Year Outcomes after Stroke Rehabilitation: A Multicenter Study in Thailand.	2013; Thailand	Prospective cohort study	Hospital and follow-up (1 year) after hospital discharge. Of 327 patients*, only 214 (65.4%) were followed up for at least one year.
E <sub>16</sub> <sup>(22)</sup>	Intracerebral hemorrhage and delirium symptoms. Length of stay, function, and quality of life in a 114-patient cohort.	2013; United States	Prospective study	Hospital and follow-up; the study involved 114 patients.
E <sub>17</sub> <sup>(23)</sup>	Is it beneficial to increase the provision of thrombolysis? – a discrete-event simulation model.	2012; United Kingdom	Retrospective study (5 years: Jan. 2003 to Dec. 2007)	Analysis of data extracted from the Patient Administration System (PAS), of the Belfast City Hospital (BCH), and transferred from the BCH to the South-East Belfast Community Stroke Scheme (rehab); in total, 419 patients were included in the study.
E <sub>18</sub> <sup>(24)</sup>	Satisfaction with care as a quality-of-life predictor for stroke patients and their caregivers.	2012; Netherlands	Cross-sectional study	Hospital. In total, 251 dyads (patient and caregiver couples) were involved in the study.
E <sub>19</sub> <sup>(25)</sup>	Depressive symptoms and disability in chagasic stroke patients: Impact on functionality and quality of life.	2013; Brazil	Cross-sectional study	Hospital. In total, 21 patients with Chagas disease and prior diagnosis of stroke.

Note: S – study and numerical order (ex.: S18); EG – experimental group; CG – control group; n.a. – not applicable; \*CVA = cerebrovascular accident/ TIA = transient ischemic attack.

## RESULTS

Chart 4 shows the main results and conclusions of the studies, presented as central topics or “descriptive

aspects”. In this summary, the numerical order presented before remains the same, for easy reading, understanding and interpretation of all studies, both individually and collectively.

**Chart 4** – Studies included in the integrative review, highlighting the main results and conclusions

Nº	Results and conclusions: descriptive aspects - summary
S <sub>1</sub> <sup>(7)</sup>	In the postdischarge period (12-month follow-up), the caregivers of elderly patients with stroke who participated in the experimental group provided care of better quality ( $\beta=0.45$ ; $p=0.03$ ) than those of the control group; between month 6 and 12 after discharge, the probability of re-hospitalization was higher for control group patients than for the experimental group patients ( $X^2=5.11$ ; $p=0.03$ ). Conclusion: early attention and care, training, evaluation and follow-up of patients and their families (caregivers) during hospitalization and after discharge, improve the quality of care provided to patients and reduces re-hospitalization.
S <sub>2</sub> <sup>(8)</sup>	Considering all domains analyzed related to stroke [...], the effect size of the treatment was close to 0 [...] for all of them, except for the domain “knowledge and lifestyle”, which showed a significant effect resulting from the intervention ( $p=0.0003$ ). Only the domain “knowledge and lifestyle” improved with the intervention, not demonstrating the superiority of any model (“ <i>comprehensive postdischarge care management</i> ”) in relation to others (“ <i>organized acute stroke department care with enhanced discharge planning</i> ”). However, in both groups, discharge planning and follow-up were guaranteed.
S <sub>3</sub> <sup>(9)</sup>	The depressive symptoms were associated with a lower health-related quality of life (HRQoL). The ability to perform personal and social activities, the interests, younger age, education (basic, elementary education) and reduced length of stay were associated with higher HRQoL. The perception of participation in their own discharge planning was positively and negatively associated with HRQoL. Several variables contribute to HRQoL in two to three weeks after the discharge, particularly fewer depressive symptoms and involvement/participation in social activities (such as outdoor activities and interest-driven activities). The participation in their own discharge planning was positively and negatively perceived by the patients.
S <sub>4</sub> <sup>(10)</sup>	This comment by Griffiths (E <sub>4</sub> ) regarding the study conducted by Anderson et al. (S <sub>2</sub> ) highlights important aspects related to patients with stroke and the hospital-home transition process (ex.: rehabilitation, length of stay, discharge). It highlights that early discharge does not lead to significantly better results (at month 6) for the patients and it may cause worse results in terms of QoL and mental health for their caregivers. It also reminds that the care provided at stroke centers is more effective than the care provided by general infirmaries. Conclusion: this comment states reduced length of stay ( <i>accelerating</i> hospital discharge) may occur without apparent damage to relatively independent patients with stroke; it also states weak evidence of the advantages of early discharge and lower costs related to patients (staying) in the (habitual) general care units; it also states further studies should be conducted on impacts on caregivers [...].
S <sub>5</sub> <sup>(11)</sup> [S <sub>4,1</sub> ]	Study commented by Griffiths [S <sub>4</sub> ], which presents the following results and conclusions: in general, the clinical results at month 6 after randomization, did not differ significantly in the comparison between the groups, but the total length of stay in the experimental group was significantly reduced (15 versus 30 days; $p=0.001$ ). The caregivers from the “home rehabilitation” group presented significantly lower levels of mental health (SF-36) [...].
S <sub>6</sub> <sup>(12)</sup>	The groups were analyzed through different approaches: habitual care versus discharge intervention through care planning (interdisciplinary teams) and strict collaboration with primary care units (clinical centers). A significant improvement was presented in all 5 domains evaluated (with each domain showing a positive effect of the intervention), leading to a better profile of health and secondary prevention ( $p < 0.0001$ ), at month 3 after CVA and after TIA. Thus, this care management model resulted in significant improvement of the profile of health and secondary prevention at month 3 after discharge.
S <sub>7</sub> <sup>(13)</sup>	The studies/articles suggest that the stroke survivors and their families have additional education and support needs besides the typical attention, and this intervention may be leveraged by adopting more active (and not reactive) actions, preventing crises or potentially preventable ruptures. This review provides information about the ideal methods of communication and planning and identifies how to benefit from these opportunities. Conclusions: there is much to be performed by the multidisciplinary team; additional investigation and experimental studies [...] will allow improved and better-informed clinical practice and develop better practical guidelines to ensure reduced stress and anxiety of caregivers, at admission and discharge; additional investigation is needed on the effects of education and emotional support provided at hospitals and primary care clinics.
S <sub>8</sub> <sup>(14)</sup>	Two and a half years after hospital discharge (t3), significantly fewer patients of the experimental group were hospitalized (2 versus 5) or died (4 versus 11) [ $p=0.010$ ]. Participation in an intensive training/work program and hospital discharge process planning leads to better results in general, even in the long term (t3), representing a significant predictor (the 3rd, related to better functional quality at discharge and younger age) for lower hospitalization and mortality rates. The effects of participation in a program with these characteristics may persist in the long term, leading to care maintenance at home and reducing hospitalization and mortality rates.
S <sub>9</sub> <sup>(15)</sup>	Despite the numerous results, the study concluded that a well-structured and monitored program, especially in terms of objectives and duration (ICP - Integrated Care Pathway), did not show any advantage over a conventional multidisciplinary approach (regarding the functional recovery and indicators of quality of life), in patients with stroke followed up at stroke rehabilitation units. Such indicators of functional recovery and quality of life (QoL) were better and reached more quickly in the group that received a conventional multidisciplinary approach.
S <sub>10</sub> <sup>(16)</sup>	The results of this study showed that patients with minor stroke and their spouses and caregivers may experience great challenges in postdischarge adaptation. Recovery from a minor stroke may require a reformulation of life plans and priorities, and the inclusion of resulting inabilities in current and future situations, for the patients and their spouses and caregivers. In many cases, such adaptations are aggravated by transitions associated with the normal aging process. The study concluded that there is not enough information about the recovery process (and the role of caregivers) of patients with minor stroke in relation to the normal aging process. Therefore, further investigation is required to analyze this transition, to support discharge planning actions performed by nurses and other health professionals.

To be continued

Chart 4 (concluded)

Nº	Results and conclusions: descriptive aspects - summary
S <sub>11</sub> <sup>(17)</sup>	This comment by Stevenson (S <sub>11</sub> ) to the study conducted by Kalra, Evans, Perez et al. (S <sub>not selected</sub> ) highlights the main results and conclusions, among other important aspects. This comment provided under the title "Training informal caregivers of patients with stroke improved patient and caregiver QoL and reduced costs" states that, at month 12, the patients from the group of trained caregivers improved their mood and quality of life, but no difference was observed in relation to the patients from the usual care group, in terms of mortality, hospitalization and functionality. Regarding the caregivers from the experimental group, they improved their mood and QoL, with reduced overload due to care provision, when compared to the control group of usual care [...]. In brief, the provision of training to caregivers of patients with stroke improves their QoL and mood/vigor, reduces health care costs without, however, impacts on mortality, hospitalization and functionality of patients, when compared to usual procedures of the caregivers without a specific training.
S <sub>12</sub> <sup>(18)</sup>	An ongoing experimental study that started in November 2013, and whose last patient was included on August, 1st, 2015. A study with acupuncture acting as an experimental variable in the therapeutic process, which comprises speech/language therapy plus initial therapy (for patients with post-stroke aphasia).
S <sub>13</sub> <sup>(19)</sup>	An analysis was conducted (a literature review) of 4 central aspects in care provision to patients with stroke (fast evaluation and treatment start; thrombolytic therapy; organized stroke units; early controlled discharge, with community supporting services). The authors state it would be possible to have substantially better results. They indicate it would be possible to reduce the number of annual hospital episodes (3.3%), reduce the number of days in intensive care units (25.9%), reduce the number of days in home care (12.8%), reduce the number of deaths in hospitals (14.9%), and reduce the amount of direct and indirect costs in the country. Conclusion: they state that it would be possible to substantially reduce costs and improve clinical results if the effective and largely known treatment types were more intensively used.
S <sub>14</sub> <sup>(20)</sup>	This study addresses the problem of stroke in young people (aged 18 to 55 years), relating it to the Fabry disease, in a prospective study whose objective was to estimate and determine the prevalence of Fabry disease in adult and young patients with stroke. Conclusion: they assume that this was the first initiative in the country (at the time) developed to determine the prevalence of a positive result for Fabry disease in young adults with stroke. In addition, this initiative (Canadian Fabry Stroke Screening Initiative) will provide information about recurrent vascular events, inability present at month 6 (via modified Rankin scale), and predisposition of this poorly studied population.
S <sub>15</sub> <sup>(21)</sup>	This prospective study without any explicitly defined objectives intended to determine long-term effects of intensive rehabilitation therapy in patients with CVA. In summary, the results indicated low functionality at month 12 was significantly correlated with longer length of stay, longer time between stroke and being transferred from acute care to a rehabilitation unit, and higher levels of depression at month 12. Conclusion: about half the patients recovered at least one degree in the level of inability measured in the follow-up; however, they emphasize that low functionality at month 12 is associated with longer length of stay (1st admission), delay in rehabilitation program and psychological depression.
S <sub>16</sub> <sup>(22)</sup>	Approach to the prognostic value of delusion symptoms in patients hospitalized in intensive care units (ICUs), with brain injury caused by intracerebral hemorrhage (not by ischemic stroke). The presence of such symptoms of delusion was associated with higher probability of negative functional results (poor functionality) and lower QoL in the future, in the domains of cognitive-executive function, after corrections for brain damage at admission, age, therapeutic measures (benzodiazepines), among others. Conclusion: they state that, after focal brain injury, the symptoms of delusion are frequent, despite low infection rates and the sedative therapy, and act as predictors of poor functional results and lower QoL.
S <sub>17</sub> <sup>(23)</sup>	A retrospective study that questions and demonstrates how an intensified thrombolytic therapy (thrombolysis) reduces health care costs (leading to moderate savings) and improves the scores/levels of QoL of patients. Results: the study states the costs (of thrombolysis) make up for the reduced hospital costs of rehabilitation and hospitalization, with corresponding improvement in QoL. An increase of 10% to 50% in thrombolytic therapy in eligible patients potentially corresponds to 8.26% savings in (community) rehabilitation costs and 12.3% savings in hospitalization costs, per patient.
S <sub>18</sub> <sup>(24)</sup>	The age of patients was significantly related to their QoL. Also, the age and level of instruction of their caregivers were significantly related to QoL. The inability of patients at hospital admission and length of stay were associated with QoL, and the inability of patients at hospital admission was also related to the QoL of caregivers. No relation was observed between length of stay and QoL of caregivers. Patient satisfaction with care provision was associated with the QoL of both patients and caregivers. Using the APIM model, which can consist in an Actor – Partner (patient – caregiver) Interdependence Model, the authors conclude that patient satisfaction with care provision was the most important indicator and determinant of QoL of patients and caregivers.
S <sub>19</sub> <sup>(25)</sup>	Although the study analyzed a particular group of patients – with stroke and Chagas disease, the authors attempted to investigate a correlation between inability and depressive symptoms (associated with stroke) with functional performance and QoL. A correlation was observed between the functional scores (mRS and BI), but not with the subscales of QoL; with these subscales, a correlation was observed between the scores in the depression scale, although depression was not associated with basic functionality. They also observed a stronger correlation and influence on QoL with the depressive symptoms than with the motor consequences of stroke, although these motor sequelae affect functionality more than the depressive symptoms.

Note: S – study and its numerical order; mRS – modified Rankin scale; BI – Barthel index; CVA = cerebrovascular accident; HRQoL = Health-related quality of life; ICUs = intensive care units; QoL = quality of life; APIM = Actor – Partner Interdependence Model.

## DISCUSSION

The selected articles present geographical diversity and use different methodologies (Chart 3), from a simple comment about scientific articles (made by experts) to randomized studies with dual randomization, prospective studies, retrospective studies, cross-sectional studies, literature review and even an ongoing study. Likewise, the number of participants (Chart 2) also presents a high variation, even when not using 'patients' as sample units, but the number of articles in a literature review. Despite such diversity, an effective convergence is observed in the topics addressed, as the authors desired, according to the initial selection of study terms.

Chart 4 provides the main contribution for this discussion, as it presents a summary of the main results and conclusions of each study. Thus, focused on clinical spheres and preparatory, prior or subsequent circumstances (terms used in the search: discharge planning; length of stay; after stroke), we can state, just like  $S_1^{(7)}$ , that the best health care results are obtained with more attention dedicated to the hospital-home transition process, with lower probability of re-hospitalization, despite having no direct impact on the QoL of the patient or caregiver. Moreover,  $S_2^{(8)}$  does not present significant differences in the five domains analyzed when comparing two replicable health care models; of these domains, only the one related to knowledge and lifestyle improved with the model, always ensuring discharge planning and follow-up. Another approach used in the studies was the participation of patients in the discharge planning and the relation with a perception of higher or lower HRQoL;  $S_3^{(9)}$  shows that such participation can be positively or negatively perceived. In a comment to two studies in this regard,  $E_4^{(10)}$  highlights that early discharge does not produce significantly (necessarily) better results for patients, and it may present worse results in terms of quality of life and affect the mental health of caregivers. This important moment of the therapy process (hospital discharge) is also addressed by other studies ( $S_{6,8,11}^{(12,14,17)}$ ), studied or commented in different perspectives, but always aligned with the need to involve all stakeholders, that is, hospital, patient, patient's family, caregivers, healthcare services and patient rehabilitation guarantee. Stroke recovery processes, with increased functionality and QoL, represent multiple transitions of situational and health-disease conditions, where the final process of subjective well-being, well-being in the relationship with others and mastery is relevant<sup>(5)</sup>.

Another aspect to be analyzed and discussed refers to functionality, which may be interpreted in different ways but is unquestionably a dimension usually affected in a patient with stroke. Seven of all 19 studies (~ 37%) selected for this review address it explicitly in terms of results and conclusion, although only 3 studies use such functionality as a concept in their objectives.

When associating functionality with the perception of HRQoL,  $S_3^{(9)}$  confirms functional, personal/motor and social preservation (among other variables) is related to a better perception of HRQoL, being a significant predictor ( $S_8^{(14)}$ ) for lower hospitalization and mortality rates, also in the long term; on the other hand, it seems insensitive to the approaches experimentally used in one study ( $S_9^{(15)}$ ), whose objective was to evaluate

the effectiveness of a structured program (ICP) in the reduction of length of stay, without affecting such functionality. Other studies/comments agree in these different realities; in  $S_{11}^{(17)}$ , the provision of training to caregivers of patients with stroke improves important aspects of their own lives but has no impact on the functionality of patients (when compared to usual procedures of caregivers without specific training). In  $S_{16}^{(22)}$ , this dimension is correlated to prior focal symptomatology; in  $S_{15}^{(21)}$ , there seems to be a relation with a very long length of stay (affecting functionality at month 12), among other aspects related to and resulting from health care as a process.

Another focus is on QoL, which is almost always, or always, affected in patients with stroke or their caregivers. Of the reviewed studies, about 32% address it in their objectives, assuming it as a focus or measurement of analysis and treatment ( $S_{3,10,16,17,18,19}$ ), but more than half of these studies (10 out of 19) use this dimension to measure results or make comparisons, integrating and analyzing it a result and/or conclusion (refer to the tables presented above).

Although  $S_1^{(7)}$  identifies some limitations, it also assumes that, even with several improvements in health care, more training, more attention, evaluation and follow-up, the results did not present better QoL of caregivers or patients. Likewise,  $S_2^{(8)}$  and  $S_9^{(15)}$  presented similar results in this sense; quality of life did not improve with the application of an intervention when comparing two health care models; and a well-structured and monitored program did not show any advantage over a conventional multidisciplinary approach in terms of improved indicators of QoL.

As addressed before in a reference to  $S_3^{(9)}$ , this study, which evaluates the participation and integration of patients in their own discharge planning, shows some variables (preservation of personal and social functionality, interests, young age, level of education/instruction and shorter length of stay) have a relation with higher HRQoL. Some studies specifically address the sphere of caregivers ( $S_7^{(13)}$ ,  $S_{11}^{(17)}$ ) or, like  $S_{18}^{(24)}$ , address patient-caregiver pairs. One of the conclusions of  $S_7^{(13)}$  requires "additional investigation about the effects of educational and emotional support on hospital and outpatient clinics, on QoL of caregivers and prevention of re-hospitalization or admission to continuous care units (home care)", while  $S_{11}^{(17)}$  states that, "at month 12, the patients from the group of trained caregivers presented better mood and quality of life" and concludes as follows: "the provision of training to informal caregivers of patients with stroke improves the mood and the QoL of both patients and caregivers," among other equally important aspects. In  $S_{18}^{(24)}$ , in brief, "the authors conclude that patient satisfaction with care provision was the most important indicator and determinant of quality of life of patients and caregivers".

Three other studies showed results and conclusions related to this dimension:  $S_{16}^{(22)}$  correlates QoL to focal neurological symptomatology (in a particular clinical situation), ensuring that such symptom (delusion) was associated with lower QoL in the future, in the domains of cognitive-executive function;  $S_{18}^{(24)}$  shows how an intensified thrombolytic therapy (thrombolysis) produced better scores/levels of quality of life of patients; and  $S_{19}^{(25)}$  correlates this dimension with depressive symptoms rather than with motor consequences (impairment) of stroke.

Lastly, we analyzed and discussed some of the approaches to depression used by the studies, a dimension perceived and interpreted in the context of psychoemotional manifestations resulting from this neurovascular pathology. It was not used as an objective of studies or search term, but it is often used in studies involving these patients and their family members, particularly in the context of this review. Although only  $S_{19}^{(25)}$  assumes it in its title and/or objectives (depressive symptoms), this manifestation is addressed by  $S_3^{(9)}$ ,  $S_{15}^{(21)}$  and  $S_{19}^{(25)}$ . Depressive symptoms were related to QoL in two cross-sectional studies ( $S_3^{(9)}$ ,  $S_{19}^{(25)}$ ) and to functionality in a prospective study ( $S_{15}^{(21)}$ ), exploring its interactions, often with losses (lower QoL and lower functionality) due to the manifestations or levels of the depressive symptoms evaluated.

## FINAL CONSIDERATIONS

A healthy brain involves the idea of a complex global mechanism and a mystery in constant revelation<sup>(26-31)</sup>; many of the effects of brain injury and pathology are likewise diversified, complex and present high interindividual variability<sup>(32)</sup>.

As discussed above and presented in the tables of this review, there is no single sense that could be applied to all realities and all patients. It may even contradict some of the results and topics presented in this study, in particular those related to QoL; however, we emphasize an idea discussed above: "patient satisfaction with care provision was the most important indicator and determinant of QoL of patients and caregivers".

After a more comprehensive reading of these studies, the relation between a functional-physical and psychoemotional (depression) dimension and QoL perceived seems clearly intricate; we have not evaluated specifically this psychoemotional dimension, but it was referred to and correlated in several studies, as indicated above. Contradicting possible "technicist" trends in the current care provision, this reference to "satisfaction with care provision", eventually based on a relational dimension, should be highlighted for the definition of a good health system, for patient-centered supporting services, patients in transition, or in the sphere of education, particularly in nursing training programs.

In summary, given the study question and objectives defined for this integrative review, we can conclude that length of stay and, particularly, a careful, timely and personalized discharge planning tend to have an impact on the QoL of patients (and their caregivers) and on their functionality, understood in *lato sensu*, when analyzing references to the persistence of psychoemotional alterations extending over a long time and constituting a characteristic and a potential alert to the need for a therapeutic intervention. This transition is critical in a complex physical and psychological process of adaptation to a different condition.

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