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Comparing Quality of Life After Right and Left Hemispheric Stroke: A Narrative Review

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ABSTRACT

Background: Stroke is a leading cause of disability worldwide, with long-term effects extending beyond physical impairment to include communication, cognition, and emotional well-being. Evidence suggests that quality of life (QoL) outcomes differ between right and left hemispheric strokes due to hemisphere-specific deficits; however, comparative synthesis remains limited. Objectives: This narrative review aims to compare QoL outcomes between left and right hemispheric stroke survivors, highlight hemisphere-specific rehabilitation strategies, and identify gaps in the existing literature. Methods: A selective literature search was performed using PubMed, Scopus, and Google Scholar for articles published in English between 2000 and 2024. Search terms included stroke, hemispheric, right hemisphere, left hemisphere, quality of life, and rehabilitation. Peer-reviewed studies reporting QoL outcomes and rehabilitation approaches were included. Evidence was synthesized narratively into thematic domains. Results: Left hemispheric strokes are strongly associated with aphasia and post-stroke depression, both of which significantly impair communication, emotional well-being, and social participation (5–8,19). Right hemispheric strokes frequently result in visuospatial neglect, anosognosia, and emotional dysregulation, leading to increased caregiver burden, impaired safety awareness, and reduced interpersonal functioning (10,14,20,21). Rehabilitation approaches differ accordingly: left hemispheric survivors benefit most from intensive speech therapy and psychological interventions (22,23), whereas right hemispheric survivors require visuospatial training, awareness therapy, and social cognition interventions (25–27). Emerging therapies, including virtual reality, robotics, and brain–computer interfaces, show promise but remain under evaluation (28,29). Conclusion: Quality of life after stroke is determined not only by physical disability but also by hemisphere-specific deficits. Tailored rehabilitation strategies addressing communication, emotional, cognitive, and social domains are essential for optimizing outcomes. Future research should emphasize standardized QoL assessments, cultural validation, and large-scale longitudinal studies to strengthen evidence-based clinical practice.

Keywords
Stroke; Quality of life; Left hemisphere; Right hemisphere; Aphasia; Neglect; Rehabilitation; Narrative review

INTRODUCTION

Stroke remains one of the leading causes of disability and mortality worldwide, contributing substantially to the global burden of disease. As populations age and life expectancy increases, the incidence of stroke continues to rise, particularly in low- and middle-income countries where healthcare systems face resource constraints. Beyond survival, stroke imposes profound long-term consequences on individuals' quality of life (QoL), affecting not only physical functioning but also psychological, cognitive, and social well-being. For many survivors, the challenges of reintegration into daily life and society outweigh the acute clinical episode itself. A growing body of evidence suggests that outcomes following stroke are not uniform but may vary depending on the cerebral hemisphere affected. Left hemispheric strokes are frequently associated with aphasia, apraxia, and mood disturbances such as depression, while right hemispheric strokes often result in visuospatial neglect, impaired awareness of deficits, and emotional dysregulation. These hemisphere-specific impairments exert distinct influences on patients' QoL, shaping their ability to communicate, maintain independence, and participate in social roles. Despite recognition of these differences, comparative analyses of QoL outcomes between left and right hemispheric stroke survivors remain limited and fragmented across the literature.

The importance of addressing this gap lies in its potential to inform rehabilitation strategies that are tailored to hemisphere-specific deficits. Optimizing interventions requires not only an understanding of physical and functional impairments but also a consideration of the emotional and social dimensions that underlie patients' lived experiences. This narrative review aims to synthesize the available evidence on differences in QoL outcomes between left and right hemispheric strokes, highlight rehabilitation approaches best suited for each group, and identify gaps in current research that warrant further investigation.

METHODS

This article was designed as a narrative review with the aim of summarizing current evidence on quality of life (QoL) outcomes following right and left hemispheric stroke. A selective literature search was performed in commonly used databases, including PubMed, Scopus, and Google

Scholar, to identify relevant publications. Search terms combined key concepts such as "stroke," "hemispheric," "right hemisphere," "left hemisphere," "quality of life," and "rehabilitation."

The search was limited to articles published in English between 2000 and 2024 to capture both foundational studies and more recent advances in stroke rehabilitation. Preference was given to peer-reviewed original studies, reviews, and clinical guidelines reporting QoL outcomes or rehabilitation strategies specific to hemispheric involvement. Case reports and pediatric stroke studies were excluded due to their limited generalizability. The retrieved literature was evaluated narratively rather than systematically. Evidence was grouped into thematic categories, including (1) clinical profiles of hemispheric stroke, (2) QoL domains affected, (3) rehabilitation strategies tailored to hemispheric deficits, and (4) emerging therapies. No formal quality assessment or meta-analysis was conducted, as the purpose of this work was to provide a descriptive synthesis and highlight key trends, knowledge gaps, and implications for clinical practice.

RESULTS

Clinical Profiles of Hemispheric Stroke

Left hemispheric stroke is most frequently characterized by aphasia, apraxia, and contralateral motor impairment. Aphasia, resulting from lesions in Broca's or Wernicke's areas, severely restricts expressive and receptive communication, which in turn limits social participation and independence (5,6,16). Patients with left hemisphere involvement have also been found to exhibit higher rates of post-stroke depression (PSD), a complication that can affect up to one-third of survivors and is strongly linked to poorer QoL outcomes (7,8,19). Mood regulation networks within the left frontal lobe may contribute to this vulnerability (7).

By contrast, right hemispheric stroke often manifests with visuospatial neglect, anosognosia, impaired judgment, and left-sided weakness (9,10). Neglect syndrome is particularly disabling; patients may fail to recognize stimuli on the contralesional side, leading to unsafe mobility, falls, and a heavier burden of care (14,15). Right hemisphere damage also disrupts emotional processing and pragmatic aspects of language, such as prosody, humor, and inferencing, which compromises social communication despite intact verbal fluency (11,12,18). Emotional dysregulation, including inappropriate affect or lack of empathy, further complicates social reintegration (20).

Impact on Quality-of-Life Dimensions

Physical functioning. Both hemispheric groups experience motor impairment; however, right hemisphere patients with neglect often have poorer functional outcomes despite similar motor recovery (14). Neglect has been shown to predict disability at one year post-stroke, with patients scoring lower on mobility and self-care subscales of QoL assessments (15).

Communication and cognition. Aphasia following left hemisphere stroke is one of the strongest predictors of reduced QoL, as it impedes autonomy, return to work, and self-esteem (5,16,17). Studies report that aphasic patients consistently show lower Stroke-Specific QoL (SS-QOL) scores compared to non-aphasic stroke survivors (5,17). Conversely, right hemisphere damage spares core language abilities but disrupts higher-order linguistic and cognitive functions, such as processing of intonation, sarcasm, or emotional cues, which are essential for social communication (11,12,18).

Emotional and psychological well-being. Depression is more commonly associated with left hemisphere lesions (7,8,19). Its presence not only reduces QoL but also predicts poorer rehabilitation adherence and delayed recovery (19). On the other hand, emotional lability and anosognosia are hallmarks of right hemisphere involvement (20). Anosognosia may obscure self-awareness of disability, delaying rehabilitation progress, while inappropriate affect can increase caregiver strain (21).

Social participation and safety. Aphasia restricts community reintegration for left hemisphere patients, as language barriers limit interpersonal and occupational opportunities (6,17). Right hemisphere patients, although verbally fluent, struggle with empathy and social cognition, which undermines relationships (12,18). Importantly, safety awareness is generally intact after left hemisphere stroke but frequently compromised after right hemisphere damage due to neglect and impaired judgment (14,15). A summary of hemisphere-specific differences is presented in Table 1.

Table 1. Comparison of Quality-of-Life Domains in Left vs Right Hemispheric Stroke

Domain	Left Hemisphere Stroke	Right Hemisphere Stroke
Communication	Severe impairment due to aphasia (5,16)	Pragmatic and prosodic deficits (11,12,18)
Emotional well-being	High prevalence of depression (7,8,19)	Emotional lability, anosognosia (20)
Social participation	Limited by language barriers (6,17)	Limited by neglect and impaired social cognition (12,18)
Physical functioning	Right-sided motor deficits (4)	Left-sided weakness with neglect, poorer recovery (14,15)
Safety awareness	Generally preserved (6)	Frequently impaired (14,15)

Rehabilitation Strategies by Hemisphere

Left hemisphere stroke. Early and intensive speech and language therapy has demonstrated significant improvements in functional communication and QoL for patients with aphasia (22). Psychological interventions, including screening and treatment for depression, are critical; both pharmacological and cognitive-behavioural approaches reduce depressive symptoms and improve QoL (23). Occupational therapy focusing on compensatory communication strategies and reintegration into community roles has been shown to enhance autonomy (24).

Right hemisphere stroke. Rehabilitation typically targets visuospatial neglect through interventions such as scanning training, cueing strategies, and prism adaptation therapy, which have demonstrated efficacy in restoring attention to the neglected side (25). Therapy addressing self-awareness deficits is essential, as anosognosia can limit engagement; structured awareness training has shown positive effects on rehabilitation participation (26). Furthermore, social cognition training focusing on emotional recognition and interpersonal skills has been proposed to mitigate the impact of impaired empathy and social interaction (27).

Emerging Therapies

Advances in neurorehabilitation offer promising adjunctive tools for both hemispheric stroke subgroups. Virtual reality (VR)-based therapy has been shown to enhance engagement and functional recovery, particularly in patients with neglect (28,29). Robotic-assisted training supports repetitive, high-intensity practice of motor tasks, while brain–computer interfaces (BCIs) are under investigation as innovative approaches for restoring motor control and communication (28). Although evidence is still preliminary, these emerging therapies may complement conventional rehabilitation and provide hemisphere-specific benefits.

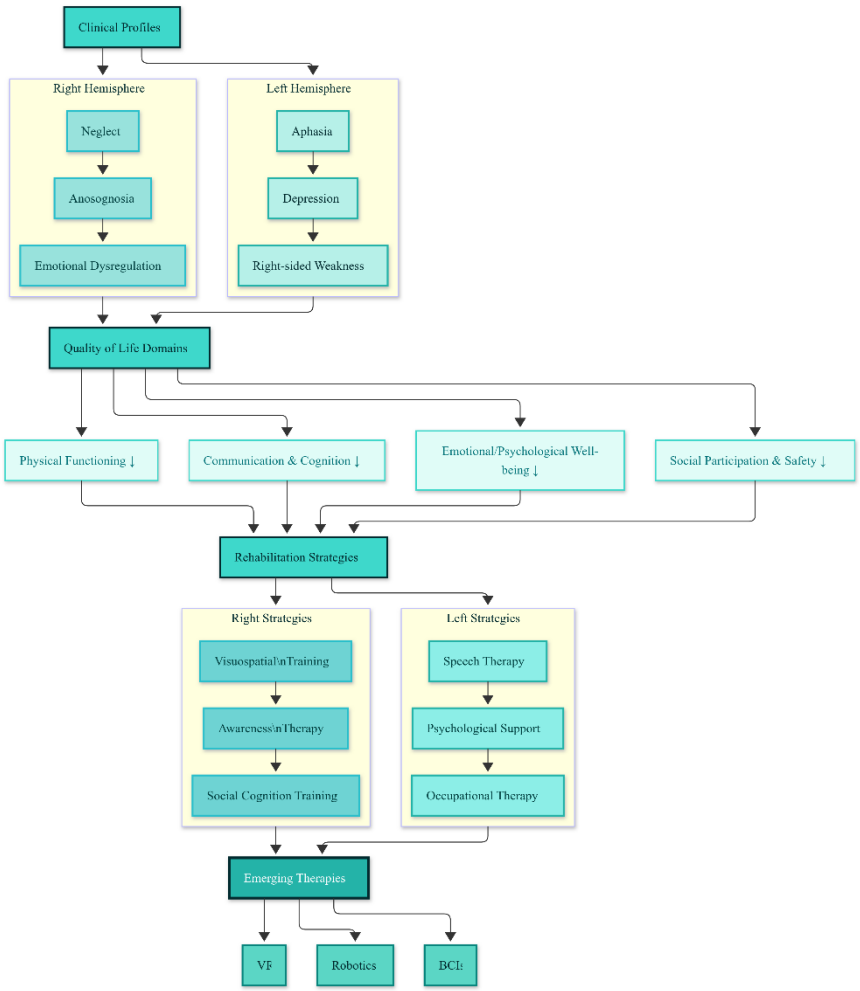

Figure 1 Study Flowchart

CRITICAL APPRAISAL OF LITERATURE

The available evidence on quality of life (QoL) after hemispheric stroke provides valuable insights into domain-specific impairments; however, several methodological limitations reduce the strength of conclusions.

First, sample sizes across many studies remain small, limiting statistical power and generalizability. For example, several investigations comparing left and right hemispheric stroke outcomes enrolled fewer than 100 participants, which constrains the ability to detect subtle but clinically meaningful differences (4,5,6). This limitation is particularly evident in studies of neglect or aphasia, where subgroup analyses are often underpowered (14,15,17). Second, there is considerable heterogeneity in the tools used to measure QoL. Instruments such as the Stroke-Specific Quality of Life Scale (SS-QOL), Short Form-36 (SF-36), and EuroQol-5D (EQ-5D) are frequently employed, but they differ in domains covered, sensitivity to change, and cultural adaptation (13,30,31). This lack of standardization complicates cross-study comparisons and may partly explain inconsistent findings regarding hemisphere-specific outcomes. Furthermore, few studies include cross-cultural validation of QoL measures, despite evidence that social and cultural expectations strongly influence perceived well-being in stroke survivors (32).

Third, variability in follow-up duration introduces additional bias. Some studies assess QoL at hospital discharge or within three months of stroke (5,6), whereas others extend observation to one year or longer (13,14,31). QoL is dynamic and may evolve with rehabilitation progress, adaptation, and psychosocial support, making single time-point assessments inadequate to capture long-term outcomes (30).

Fourth, individual variability in lesion characteristics—including size, location, and vascular territory—has not been adequately controlled in most studies. Outcomes attributed to hemispheric dominance may in fact be confounded by lesion extent or comorbidities such as diabetes and cardiovascular disease (9,19). Similarly, premorbid cognitive status, age, and social support systems are often underreported, though they substantially influence QoL trajectories (21,31).

Finally, only limited research addresses the interaction between hemisphere-specific deficits and rehabilitation strategies. While interventions such as speech therapy for left hemispheric strokes or visuospatial training for right hemispheric strokes are well documented (22,25), few studies have compared the relative effectiveness of these approaches across hemispheric subgroups. Moreover, emerging therapies such as virtual reality or brain–computer interfaces are typically evaluated in small pilot trials, with uncertain external validity (28,29).

Taken together, the literature highlights important distinctions between right and left hemispheric strokes but is constrained by small samples, inconsistent QoL measurement, heterogeneous follow-up periods, and inadequate control for confounding variables. Future research should

prioritize large-scale, multicenter longitudinal studies employing standardized QoL instruments with cultural validation. Greater emphasis on rehabilitation trials stratified by hemispheric involvement is also warranted to translate observed differences into targeted clinical practice.

DISCUSSION

This review highlights that the hemisphere affected by stroke exerts a significant influence on post-stroke quality of life (QoL). While both left and right hemispheric strokes impair physical functioning, their secondary effects diverge in ways that distinctly shape survivors' lived experiences. Left hemispheric strokes are more strongly associated with aphasia and depression, both of which reduce independence, hinder social reintegration, and are key predictors of lower QoL (5,7,19). By contrast, right hemispheric strokes are characterized by neglect, anosognosia, and emotional dysregulation, which compromise safety, increase caregiver burden, and impair interpersonal relationships (10,14,20,21).

The implications of these findings for rehabilitation are considerable. Left hemispheric survivors benefit most from intensive speech and language therapy alongside psychological interventions to manage depression (22,23). In contrast, right hemispheric survivors require focused visuospatial training, awareness therapy, and interventions targeting social cognition (25–27). Recognizing these hemisphere-specific needs allows clinicians to design individualized rehabilitation programs that extend beyond motor recovery and address emotional, cognitive, and social domains of QoL.

Emerging therapies, such as virtual reality, robotics, and brain–computer interfaces, provide promising adjuncts to conventional rehabilitation. VR has shown early success in treating visuospatial neglect (28,29), while robotic-assisted therapy offers structured, high-intensity motor training and BCIs may bridge motor and communication deficits (28). However, their integration into standard care remains limited, and current evidence is derived from small pilot studies. Robust multicenter trials are needed to establish their effectiveness in hemisphere-specific subgroups.

"Quality of life after stroke is determined less by the severity of motor impairment and more by hemisphere-specific deficits such as aphasia, neglect, depression, and emotional dysregulation."

Critical evaluation of the literature reveals several limitations that constrain generalizability. Small sample sizes, heterogeneous QoL assessment tools, and variable follow-up durations limit the comparability of findings (13,30,31). Furthermore, confounding factors such as lesion size, comorbidities, and social support remain underreported (9,19,21). Cultural factors also shape perceptions of QoL, yet few studies validate QoL instruments across diverse populations (32). Addressing these gaps through large-scale, standardized, and culturally sensitive research will be essential for advancing evidence-based rehabilitation strategies. Overall, this review underscores the importance of tailoring post-stroke rehabilitation to hemispheric involvement. While both left and right hemisphere strokes reduce QoL, the underlying mechanisms differ substantially, requiring nuanced clinical approaches.

CONCLUSION

Quality of life outcomes following stroke are shaped not only by the severity of physical disability but also by hemisphere-specific deficits in communication, cognition, emotional regulation, and social functioning. Left hemispheric strokes predominantly impair language and emotional well-being, whereas right hemispheric strokes compromise visuospatial awareness, insight, and social cognition. Rehabilitation must therefore adopt a multidimensional and individualized framework, integrating speech therapy, psychological support, visuospatial training, and emerging technologies according to the hemisphere affected.

Future research should emphasize large-scale longitudinal studies with standardized, culturally validated QoL instruments and evaluate hemisphere-specific rehabilitation interventions more systematically. Such efforts will enhance our ability to design targeted strategies that optimize recovery trajectories and improve the long-term well-being of stroke survivors.

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